

STANDARD OPERATING PROCEDURES (SOP)
FOR
THE COAST GUARD'S TRAINING SYSTEM

Volume 9

PQG



Office of Workforce Performance, Training and Development
Assistant Commandant for Human Resources
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USCG Training System SOP 09: PQG

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Overview

Introduction

Per Commandant's Instruction M1414.8 (series) ([Enlisted Performance Qualification Manual](#)) and based on their rating competency and expertise, Coast Guard enlisted members are classified as apprentices (E-2 to E-4), journeymen (E-5 and E-6), or masters (E-7 to E-9). E-3s advance to E-4 by attending a rating-specific "A" school that allows them to learn and demonstrate mastery of the rating-specific E-4 enlisted performance qualifications ([EPQs](#)). Upon adequate demonstration of such mastery, students graduate as E-4s. For some ratings, a nother way of advancing is to "strike" the rating (i.e., complete nonresident training and demonstrate mastery of the rating-specific E-4 EPQs on-the-job). Although some of the Coast Guard's "C" schools provide equipment-specific training that is clearly linked to a higher pay grade's EPQs, the primary purpose of "C" schools is to develop student competency in a specific area - not to advance students. The way Coast Guard enlisted members gain competency in their rating **and** advance to E-5 and E-6 is by enrolling in a nonresident program of instruction, receiving mentoring and coaching from supervisors and demonstrating on-the-job mastery of the rating-specific EPQs. To ensure this multi-faceted professional development experience is performance-based, structured and standardized, the Coast Guard has developed training aids called Performance Qualification Guides (PQGs). PQGs provide instruction, guidance, and structure to enlisted members striving to gain rating competency so they can advance to the next pay grade. PQGs also provide structure and guidelines for assigned Professional Development Supervisors (PDSs) who are mentoring and coaching members and signing off on demonstrated mastery of EPQs. Finally, PQGs provide structure and guidelines to Education Services Officers (ESOs) who are charged with helping members enroll and complete rating-specific nonresident training.

Purpose

The purpose of this SOP is to standardize PQG design, development and utilization Coast Guard-wide.

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Background

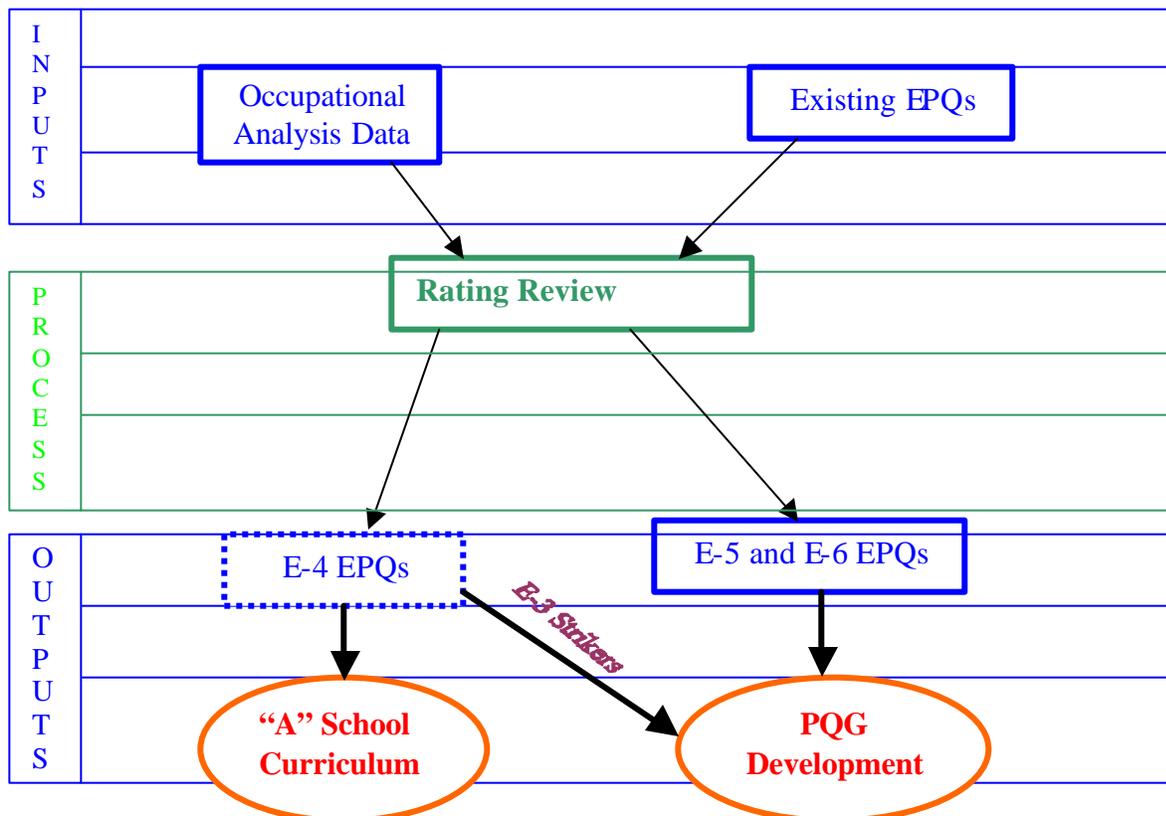
The PQG approach is more than the correspondence system it replaces. Although the former E-5 and E-6 professional development and advancement process used a correspondence course system linked to EPQs, there was no way to ensure enlisted members were focused on job performance or that supervisory involvement was appropriate, structured, and standardized. PQGs add structure to and help standardize the E-5 and E-6 professional development and advancement process.

Target Audience

The target audience for this SOP includes Coast Guard and contractor course designers and developers charged with developing PQGs. They are also E-4 and E-5 enlisted members desiring to advance to E-5 and E-6, as well as PDSs and ESOs who assist those members in the professional development and advancement process.

How PQGs Link to Analysis

[COMDTINST M1414.8 \(series\)](#) describes how the Enlisted Performance Qualifications are developed. Data collected from an Occupational Analysis is an input to a rating review and new or revised EPQs are an output of the rating review. Those EPQs at the E-4 level are the inputs to "A" school curriculum development and are the criteria a member who is striking a rating must meet. The E-4 EPQs for strikers and E-5 and E-6 EPQs are the inputs to the PQG development process.



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PQG Process

The PQG process is a performance-based, systematic approach to completing the EPQs for advancement. Under the direction of their PDSs, enrollees complete each task that directly relates to the EPQ they are trying to satisfy to be eligible to compete in the servicewide exam (SWE).

The PQG process strongly links enrollee learning (ESO PQGs, nonresident student pamphlets) with job performance (student PQGs) and supervisor involvement (supervisor's PQGs). The process for implementing PQGs at the unit level is contained in the job aid below.

Unit Implementation of PQG Job Aid

Who:	When:	Then:
Member and ESO	Member enrolls in nonresident program by ordering course.	ESO issues Assignment Letter to enrolled member.
CO and ESO	CO assigns a PDS to train member.	ESO issues Assignment Letter to PDS.
Member and PDS	Meet to review PQGs and establish training timeline.	PDS sets up member's PQG Monthly Tracing Sheet (MTS).
Member and PDS	Begin apprentice or journeyman professional development program.	Member reads PQG sheet and lesson material; practices lesson objectives, completes practical exercises/job aids/lesson self-quiz; meets periodically with PDS & asks for help if doesn't understand material. PDS provides coaching, mentoring, practice and feedback opportunities.
Member and PDS	Both working toward member completing each EPQ and PDS says member performance meets EPQ standard.	Member takes job PQGs to PDS. PDS signs off on each completed EPQ on MTS & initials/dates appropriate column in Record of Performance Qualification (CG 3303c-24). NOTE: All EPQs must be successfully completed for the member to advance.
Member	All course materials completed and performance on all EPQs approved.	Takes completed PQG, MTS and CG 3303c-1 to unit XO, training officer, ESO or other designated person for appropriate action.

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Unit Implementation of PQG Job Aid (continued)

Who:	When:	Then:
ESO and member	Member informs ESO all course materials completed and performance on all EPQs approved.	ESO orders End-of-Course-Test (EOCT). Member takes COCT and receives 76 or higher.
CO	Receives MTS/documentation.	Approves PQG.

Member is now ready to take the servicewide examination (SWE).

PQG Design and Development Process

It is important to understand that the PQG design and development process involves developing several different types of PQGs and other materials:

- Self-directed/self-instructed nonresident course materials for students that consist of lessons, job aids, topic reviews, practice exercises
- Member PQGs that the member and PDS will use for guiding the learning of course material EOs and demonstrating/documenting performance-to-standard for EPQs
- Supervisor Guidelines PQGs that provide guidance to the PDS in overseeing the learner, demonstrating new skills, providing practice opportunities, observing performance, and giving feedback; supervisor PQGs that also contain sample MTSs
- ESO Guide consisting of listing of ESO's responsibilities for the PQG program and sample assignment letters for member and PDS.
NOTE: It is not cost efficient to print multiple ESO Guides since units typically have one ESO who serves throughout his or her assignment. ESOs can use this SOP for the guidance they need and download sample assignment letters to use as templates.
- EOCT test items
- SWE test items

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NR Course Development Principles

- PQGs should incorporate job aids wherever appropriate.
 - Since PQGs are delivered in a “distance format” (i.e., not via resident instruction), their instructional design needs to reflect a “self-contained” instructional strategy.
 - PQG focuses only on performance outcomes.
 - PQG teaches students *how to do their job*, not about their job.
 - PQG requires command-level involvement and accountability that each EPQ task is learned and accomplished,
 - PQG instructional course material provides job-specific procedure guides to ensure that all EPQs can be performed satisfactorily and safely.
 - PQG includes an EOCT for key knowledge and supervisor-observed performance tests for each EPQ.
 - Since PQGs are printed by Coast Guard Institute (CGI), they must be compiled and produced in camera-ready format.
-

Step 1: Task Analysis

As the chart on page 3 illustrated ([link](#)), EPQs are derived from Occupational Analysis and Rating Reviews. Therefore, the only kind of analysis nonresident course designers and developers need to conduct is task analysis. The EPQs (in their entirety and without any deviations) become the course's Terminal Performance Objectives (TPOs). See [Appendix A](#) for more explanation and job aids to assist with EPQ task analysis.

Step 2: TPO and EO Development

There is no need to develop TPOs. The EPQs, in their entirety, are the course's TPOs. However, the course designer will still need to determine EPQ steps and substeps to properly identify the lesson's enabling objectives (EOs).

Further explanation and job aids to assist with EO development are found in the Coast Guard Human Performance Technology (HPT) / Instructional Systems Design (ISD) Handbook, [Chapter 24](#).

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Step 3: Grouping and Sequencing Objectives

This step involves grouping and sequencing objectives so they are tied together, make sense and are easily followed by the student. Grouping and sequencing objectives should:

- Produce the most learning in the shortest package.
- Help the student make the transition from one skill to another.
- Ensure material is presented in a building block sequence that paves the way for new and/or more difficult material.

See the Coast Guard HPT/ISD Handbook, [Chapter 27](#) for further explanation and job aids to assist with grouping and sequencing objectives.

Step 4: Develop Curriculum Outline

Headquarters policy requires that curriculum outlines be submitted for all nonresident courses. The substeps and a job aid for developing curriculum outlines are found in [Appendix B](#).

Self Quizzes/Topic Review Items

Self-quizzes/topic reviews are a type of test embedded in nonresident course materials. They work as reviews of each objective presented in the course. They are included in nonresident course materials to help students recall facts and apply principles, processes, procedures, and concepts. See [Appendix C](#) for samples and help with developing topic reviews.

Develop Student Pamphlets

[Appendix D](#) contains a wealth of information on developing student pamphlets. The [SK1 Student Pamphlet](#) shows an example of one way course designers and contractors have developed these course materials.

NOTE: Remember the principles for developing PQGs. Student pamphlets should contain ONLY the knowledges (enabling objectives) a student needs as prerequisites to performing the EPQ.

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Member's PQG	Click on the ET2 Nonresident PQG , an example of a member's PQG. It tells the member to read each nonresident lesson and practice the actions found in the job aid. Then, the member is advised to take the PQG and the performance job aid to the PDS so that he or she can observe the member's performance and initial the appropriate column of Record of Performance Qualifications, CG-3303C-1, upon task completion to EPQ standard.
PDS PQG	The PDS PQG is particularly useful to the supervisor because it provides sample feedback to nonresident unit practice exercises. The PDS can use or modify this feedback as a means of ensuring the member is obtaining sufficient practice in performing the EPQ and fully understands the actions and decisions required by EPQ performance. See sample Nonresident Course Supervisor Guidelines PQG .
ESO Guide for PQGs	<p>The ESO Guide is simple and short. Its purpose is to capture and standardize ESO responsibilities (i.e., enrolling member in NR course, issuing assignment letters to member and PDS, administering EOCT, etc.) for the PQG program.</p> <p>NOTE: It is not cost efficient to print multiple ESO Guides since a unit typically has one ESO who serves throughout his or her assignment. ESOs can use this SOP for the guidance they need and download sample assignment letters to use as templates.</p>
Test Item Development	Develop EOCT and SWE items in accordance with the principles and methodologies found in Appendix E .
EOCT and SWE Test Item Database and Maintenance	The Coast Guard is currently establishing Gemini Test Item Database (TID) as the standard Coast Guard database for EOCT and SWE test items. Appendix F contains a job aid to assist in developing and maintaining this database.

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Security Procedures

EOCT and SWE items and tests for PQGs are classified as "sensitive" material and must be handled according to the security procedures for sensitive material found in Physical Security and Force Protection Program, [COMDTINST M5530.1 \(series\)](#).

Since the EOCT and the SWE are printed by the CG Institute, they must be compiled and produced in a camera-ready format. The steps to ensure test item security are found in [Appendix G](#).

Job Aid for Developing PQG Pamphlet

[Appendix H](#) serves as a boilerplate for developing PQG pamphlets. The job aid was created in Word using the structured-writing template (SWT). The "master" document can be sent as an e-mail attachment and still maintains SWT keystrokes/buttons. The user only has to type over the gray areas on the cover through page 8. Page 10 contains four PQG sheets followed by four Monthly Tracking Sheets (MTSs). If additional sheets are required, copy/paste as explained in the job aid.

NOTE: To obtain the job aid, contact pvalek@tcyorktown.uscg.mil.

"Rules" for PQG Development

Until the advent of this SOP, there have been no "hard and fast" rules for PQG development. Some examples combine student pamphlets (nonresident instruction) with PQGs; other split them into two documents. Some PDS PQGs and ESO Guides are separate documents; some products do not mention ESO responsibilities and combine student and supervisor duties into one PQG.

This SOP establishes rules that govern PQG development:

1. Do NOT combine student pamphlets with student PQG worksheets unless pamphlet design and worksheets combined make a small package. As a rule of thumb, avoid creating a large "phonebook" that members and supervisors must lug around.
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"Rules" for PQG Development

2. Separate PQGs for members and supervisors wherever possible and develop within cost constraints. Each of these individuals is a different target audience with different responsibilities. Combining all materials together does no service to the program's intent, especially if that intent is to provide the PDS with feedback sheets and other materials that will make his/her job easier and standardized with other CG PDSs.

NOTE: Develop a local process whereby ESOs are aware that their PQG responsibilities are spelled out in this SOP and that it contains sample assignment letters they can use as templates. It is NOT cost effective to create separate ESO guides.

3. Unless numbers are very high, it should be possible to use the templates in this SOP for locally reproducing much of the PQG materials (supervisor MTSs, ESO guides, supervisor guides, etc.).
 4. Remember to avoid inclusion of knowledge the member already possesses or that is not directly related to EPQ performance in student pamphlets.
 5. Job aids should make up the bulk of student pamphlet materials.
 6. Refer to the [TRACEN Yorktown Style Manual](#) for a tool in selecting standardized acronyms and words specifically used in Coast Guard-wide PQG and nonresident materials.
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Appendix A

TASK ANALYSIS

Task Analysis Process

Introduction

A task analysis is the next step in the analysis phase of the ISD model. The tasks worked on during a task analysis are the ones selected for training from the job analysis. In the performance of a task analysis, we look at each task selected for training and identify those steps necessary to complete the task. These tasks and steps become the basis for developing your learning objectives and test items.

Definitions

Remember that "task" means a single work assignment that is required of a person and is independent of other actions. A task has a statement of specific action, has a definite beginning and end point, is observable and measurable, and is typically accomplished within one day.

Where job analysis is the process of identifying the tasks necessary to perform the job, a task analysis is the process of identifying the steps involved in performing the task.

A task analysis is the basic method (process) used to define the steps of a task listed in the order in which they are performed on the job, the skills and knowledge needed to perform each step of the task, and all other information pertaining to the on-the-job performance of the task.

Responsibility

A task analysis is typically performed by a subject matter specialist located at the appropriate training center.

Task Analysis Procedures

Before performing the task analysis, first check to see if there is one already in existence. If a task analysis is available, then make sure it is accurate. If a new task analysis is necessary, begin by listing the steps required to perform each task. It is important to place these steps in the order in which they are performed on the job.

The analysis of a performance task consists of the following steps:

- Listing the procedures of the task
 - Generalizing the procedures into steps
 - Listing the prerequisite skills and knowledge
-

Task Analysis Process

Task Analysis Work Sheet Record the task analysis data on the task analysis work sheet shown below.

TASK ANALYSIS WORK SHEET			
JOB		Damage Control Petty Officer	
TASK		Weigh a 15-lb portable CO ₂ fire extinguisher	
NO.	TASK STEPS		SKILLS/KNOWLEDGE
1	Remove CO ₂ fire extinguisher from its station.		<ul style="list-style-type: none"> • Know safety precautions for pressurized cylinders. • Identify equipment/ locations. • Lift minimum of 50 lbs.
2	Read bellyband to determine total weight of fire extinguisher. Note: If unreadable, use manual.		<ul style="list-style-type: none"> • Identify components of fire extinguisher. • Use manuals.
3	Attach fire extinguisher to the mounting eye.		
4	Lift scale to suspend bottle.		
5	Read scale.		
6	IF weight is . . .	THEN . . .	<ul style="list-style-type: none"> • Know inspection tag procedures.
	1.5 lb < total weight	follow ship's SOP to replace.	
	equal to total weight on belly band	<ul style="list-style-type: none"> • Complete inspection tag and • Replace fire extinguisher at station. 	REFERENCES: NEM M9000.6 (series) NSTM 555 NAVEDTRA DC 3&2 TM 2006

Additional Info For more information on task analysis, read [chapter 22](#) in the HPT/ISD Handbook.

Appendix B

CURRICULUM OUTLINE JOB AID

Overview

Purpose This JOB AID has been developed to guide you through the step-by-step procedure on how to develop, revise, or review a curriculum outline. The checklist on the following page will assist you throughout the curriculum development process.

Goals The goals of the standard curriculum outline are to:

- Determine training resource requirements (training aids or training equipment).
- Identify improvements or changes in training.
- Maintain agreement between job performance requirements and training needs.
- Facilitate a review and approval process.

Curriculum Outline Format Approved curriculum outlines are required by COMDTINSTs 1550.9 and 1550.11 for all Coast Guard-conducted resident and nonresident training courses. A standard curriculum format has been adopted to ensure uniformity throughout Coast Guard training and to serve as a main source of communication between training managers, the program managers, and training sources.

Note: Training Center Yorktown has templates available to help you generate the components of your curriculum outline. In Microsoft Word, go from “Start” to “New Office Documents” to the tab entitled “Curriculum . . .”. Print a copy of the template instructions before beginning your curriculum outline.

Overview

Job Aid Content

This JOB AID begins with a curriculum outline checklist of required pages for nonresident curriculum outlines. The step-by-step procedure is provided for completing each page of the outline. Refer to the sample pages attached at the end of the job aid.

- Curriculum Outline Checklist
 - Cover Page
 - Table of Contents
 - Summary of Curriculum Revision(s)
 - Mission and Scope Statements
 - Units of Instruction, TPOs, and EOs
 - Guide to Writing Objectives
 - Course Content Reference Table
 - Exhibits
 - Directions for Determining Reserve Retirement Points
 - Curriculum Outline Sample Pages
-

CURRICULUM OUTLINE CHECKLIST

No.	PART DESCRIPTION	Correct Content	Correct Sequence	Correct Format
1	Cover Page			
2	Table of Contents			
3	Summary of New Curriculum or Summary of Curriculum Revision			
4	Mission and Scope Statements			
5	Units of Instruction, Terminal Performance Objectives (TPOs) and Enabling Objectives (EOs)			
6	Course Content Reference Table			
7	Exhibits: Training Aids/Training Equipment			
8	Exhibits: References Listed in TPOs			
9	Exhibits: Training Center Pamphlets Issued to the Student			
10	Reserve Retirement Points (Add to Cover Page)			

CURRICULUM OUTLINE

FOR

____ See #1 _____ COURSE

SHORT TITLE ____ See #2 _____ COURSE CODE ____ See #3 _____

____ See #4 _____ RESERVE RETIREMENT POINTS

CLASSIFICATION: ____ See #5 _____

DEVELOPED BY

____ See #6 _____

____ See #6 _____

FREQUENCY OF REVIEW ____ See #7 _____

REVIEWED AND APPROVED AT
U.S. COAST GUARD HEADQUARTERS
WASHINGTON, DC

SUBMITTED: ____ See #8 _____
DATE CHIEF, XXXXXXXX BRANCH

FORWARDED: _____
DATE TRAINING OFFICER,
TRACEN YORKTOWN

REVIEWED: _____
DATE PROGRAM MANAGER

APPROVED: _____
DATE TRAINING MANAGER

Next Review Date: ____ See #9 _____

DIRECTIONS FOR COVER PAGE

STEP	ACTION
1	Insert the name of the course.
2	Insert the short title of the course.
3	Insert the course code and edition number.
4	Insert total reserve retirement points. See directions on page B-21.
5	Insert the proper classification. If the course is classified CONFIDENTIAL or SECRET, enter the word "CONFIDENTIAL" or "SECRET." If the course is unclassified, enter the word "UNCLASSIFIED."
6	Insert the full name of training center or unit at which the course was developed.
7	Headquarters (G-WT) training managers assign the frequency of review, which is published in COMDTINST 1550.9. Use this guide for scheduling curriculum outline review frequency.
8	Insert the month, day, and year. Curriculum outlines at TRACEN Yorktown will be forwarded to the Training Officer prior to sending to Headquarters.
9	Leave the Next Review Date blank. This will be filled in by Headquarters (G-WT).

TABLE OF CONTENTS

<u>SUBJECT</u>	<u>PAGE</u>	
Summary of Curriculum Revision	3	See #1
Mission and Scope Statements	4	
Units of Instruction, Terminal Performance Objectives (TPOs), and Enabling Objectives (EOs)	5	
Course Content Reference Table	10	See #2
Exhibits	11	
(1) Training Aids/Training Equipment		
(2) References Listed in TPOs		
(3) Training Center Pamphlets Issued to Student		

DIRECTIONS FOR TABLE OF CONTENTS

STEP	ACTION								
1	<p>Insert the page numbers for the sections listed below.</p> <p>The following three pages of every curriculum outline will be numbered as follows:</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>PAGE</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Summary of Curriculum Revision*</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">Mission and Scope Statements</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Units of Instruction, Terminal Performance Objectives (TPOs), and Enabling Objectives (EOs)</td> <td style="text-align: center;">5</td> </tr> </tbody> </table>		<u>PAGE</u>	Summary of Curriculum Revision*	3	Mission and Scope Statements	4	Units of Instruction, Terminal Performance Objectives (TPOs), and Enabling Objectives (EOs)	5
	<u>PAGE</u>								
Summary of Curriculum Revision*	3								
Mission and Scope Statements	4								
Units of Instruction, Terminal Performance Objectives (TPOs), and Enabling Objectives (EOs)	5								
2	<p>After numbering the remaining TPO and EO pages, insert the page numbers of the following sections:</p> <p style="text-align: center;">Course Content Reference Table</p> <p style="text-align: center;">Exhibits</p>								
3	Insert page number 2 (on Table of Contents page).								

*For new course, this line should be "Summary of New Curriculum."

SUMMARY OF CURRICULUM REVISION SEE #1

COURSE NAME, CODE, AND EDITION: See #2

<u>CHANGES PROPOSED</u>	<u>DESCRIPTION</u>
-------------------------	--------------------

ELIGIBILITY REQUIREMENTS: See #3

PREREQUISITES:

CONTENT:.....

LENGTH: See #4

EQUIPMENT:

FUNDING:	Costs to develop correspondence courses to support the advancement system currently average \$5.00 per camera-ready page. This cost does not factor in salaries or the cost of reproduction.
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LIMITING FACTORS:

QUALIFICATION CODE AUTHORIZED:.....

REASONS FOR PROPOSED CHANGES: See #5

See #6

DIRECTIONS FOR SUMMARY OF CURRICULUM REVISION

STEP	ACTION
1	If this outline is for a new course, the title of this page is “Summary of New Curriculum.”
2	Insert the COURSE NAME, CODE, AND EDITION.
3	<p>Insert under “Changes Proposed”—</p> <ul style="list-style-type: none"> • If this curriculum outline is being revised, write a short description of any changes within the areas listed. <p style="padding-left: 40px;">Note: If the changes cannot be stated in the space provided, insert SEE or REFER TO and then list the section on the following page.</p> <ul style="list-style-type: none"> • Insert “NONE” for areas with no changes or not applicable. • If this curriculum outline is new, this line should be “Curriculum Proposed.” Write a short description for each area listed.
4	Insert 36 months*. This is the maximum enrollment period for all nonresident courses. (*With the advent of the Performance Qualification Guide (PQG) to accompany nonresident courses, the suggested completion time is 6 months.)
5	<p>Insert under “Reasons for Proposed Changes”—</p> <ul style="list-style-type: none"> • For curriculum revisions, write a short statement of the current situation or what is currently in place and compare this with the newly proposed needs or requirements. • For new curriculum, this line should be “Reasons for Proposed Course.” Write a short statement to describe why this new course is being proposed.
6	Insert page number 3.

MISSION AND SCOPE STATEMENTS

NAME OF COURSE _____ See #1 _____

MISSION: See #2

SCOPE: See #3

PREREQUISITES: _____ See #4 _____

QUALIFICATION CODE ELIGIBILITY: _____ See #5 _____

STUDENT SECURITY CLASSIFICATION: _____ See #6 _____

See #7

DIRECTIONS FOR MISSION AND SCOPE

STEP	ACTION
1	Insert the NAME of the course followed by the short title enclosed in parentheses.
2	Write a brief statement about the course to include: <ul style="list-style-type: none"> • Purpose of the course • Type of billet for which the training is directed • Reference to the Enlisted Qualification Manual, if applicable
3	Write a short paragraph on the course including: <ul style="list-style-type: none"> • Description of the target student-- <p style="margin-left: 20px;">Specialty Paygrade Rating (if any) Job assignment</p> • Overview of the content area covered in the course. • Statement describing the performance criteria the student must meet to successfully complete the course. (The SMS and rating force manager should determine the EOCT passing score and whether the EOCT may be an open book exam,)
4	Insert all prerequisites the student must have before taking this course. If there are none, insert NONE.
5	Insert the qualification code(s) that students will be eligible for upon completion of the course. For information on the qual codes, see COMDTINST M1414.8 (series). If the course is new, contact Commandant (G-WPM) for qual code assignment. If there are none, insert NONE.
6	Insert the security classification code that a student must have before taking the course. For information on the security classification of a course, see the Security Manual, COMDTINST 5500.11 (series).
7	Insert page number 4.

UNITS OF INSTRUCTION, TPOS, AND EOS

UNIT 1.0 _____ See #1 _____

TERMINAL PERFORMANCE OBJECTIVE

1.1 See #2

ENABLING OBJECTIVES

1.1.1 See #3

1.1.2

DIRECTIONS FOR UNITS OF INSTRUCTION, TPOS, AND EOS

STEP	ACTION
1	<p>Insert the general descriptive title of the unit. Each subject area within the course will be referred to as a UNIT. Label the units in sequential order, starting with 1.0, 2.0, 3.0, etc.</p> <p><u>Note:</u> Begin each unit on a separate page.</p>
2	<p>Insert the Terminal Performance Objective (TPO) following the unit number. Label each TPO starting with 1.1, the second 1.2, etc.</p> <p>Each TPO shall meet the following requirements:</p> <ul style="list-style-type: none"> • Specify what the student will do (performance). Use capitalized, bold type for each action verb. • Specify how well the student will perform (standard). Each TPO will contain one or more references, such as a Commandant Instruction, which designate the standards of performance. • Specify what assistance, aids, or constraints (condition) the students will be given. • Focus on the quals or other job performance requirements (JPR) using the course reference table. <p><u>Note:</u> When a qual is used, its format must be adjusted to meet requirements. Begin a new page for each TPO in a given unit.</p> <ul style="list-style-type: none"> • List the title and number of each published reference. Place the title first, followed by a comma and the reference number.

DIRECTIONS FOR UNITS OF INSTRUCTION, TPOS, AND EOS

STEP	ACTION
3	<p>Insert each Enabling Objective (EO) that supports the TPO. Each EO shall meet the following requirements:</p> <ul style="list-style-type: none"> • Be a step required to complete the TPO. • Be numbered sequentially and begin with the first digits of the TPO. For TPO 1.1, number the first EO as 1.1.1, the second as 1.1.2, etc. • Specify what the student will do (performance). Use capitalized, bold type for each action verb. • Specify how well the student will perform (standard). • Specify what assistance, aids, or constraints (condition) the students will be given. • List the title and number of each published reference. When more than one reference is listed in the TPO and each reference is used in all of the EOs, use the following statement: <u>“Enabling Objectives: The standard(s) statement for each of the following EOs is the same as written in the TPO.”</u>
4	Insert page number 5.

GUIDE TO WRITING OBJECTIVES

STEP	ACTION												
1	<p>Begin each TPO and EO with a condition statement (what assistance, aids, or constraints the student will be given).</p> <p>Example: “Given deviation and compass heading,</p>												
2	<p>Insert an action verb (the performance required).</p> <p>Example: “. . . COMPUTE the magnetic heading . . .”</p>												
3	<p>End each objective with a reference (standard).</p> <p>Example: “. . . in accordance with Dutton’s “Piloting and Navigation.”</p>												
4	<p>Write TPOs and EOs to test four-response, multiple-choice, end-of-course test items. Below is a list of common verbs*:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">apply</td> <td style="padding-right: 20px;">convert</td> <td>select</td> </tr> <tr> <td>calculate</td> <td>determine</td> <td>solve</td> </tr> <tr> <td>classify</td> <td>discriminate</td> <td>troubleshoot</td> </tr> <tr> <td>compute</td> <td>identify</td> <td></td> </tr> </table> <p>*With the development of Performance Qualification Guides (PQGs), other action verbs (e.g., perform, transmit, locate, specify, apply, etc.) may be used because the professional development supervisor (PDS) will acknowledge the student’s accomplishment (performance) of tasks instead of testing the student’s knowledge as an EOCT question.</p> <p>Example: Given deviation and compass heading, COMPUTE the magnetic heading in accordance with Dutton’s Piloting and Navigation.</p> <p>Corresponding EOCT test item: What is the magnetic heading if the deviation is 2E and the compass heading is 180°?</p> <p>A. 182° B. 181° C. 180° D. 178°</p>	apply	convert	select	calculate	determine	solve	classify	discriminate	troubleshoot	compute	identify	
apply	convert	select											
calculate	determine	solve											
classify	discriminate	troubleshoot											
compute	identify												
5	<p>Capitalize each action verb in the TPOs and EOs and use bold face type. Use only one verb for each objective. The final product follows this pattern: CONDITION + PERFORMANCE + STANDARD</p>												

COURSE CONTENT REFERENCE TABLE

TPOs

REQUIREMENT JUSTIFICATIONS

1.1 See #1

See #2

Below is a chart to determine requirement justification.

IF the course is . . .	THEN . . .
a rate course	list all performance factors from the Enlisted Qualification Manual.
a specialty course	use Job Task Analysis Panel, Field Survey, etc.

ENLISTED QUALIFICATIONS NOT COVERED: See # 3

DIRECTIONS FOR COURSE CONTENT REFERENCE TABLE

STEP	ACTION						
1	List all TPO numbers contained within the course.						
2	<p>Insert the proper justification for each TPO. The purpose of the Course Content Reference Table is to justify course content.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">IF ...</th> <th style="text-align: center;">THEN write as follows ...</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">an enlisted qualification is used</td> <td style="padding: 5px;"> Enlisted Qualifications Manual (EQM), COMDTINST M1414.8 (series) A.4.01 </td> </tr> <tr> <td style="padding: 5px;">a job task analysis panel is used</td> <td style="padding: 5px;">JTA Panel</td> </tr> </tbody> </table>	IF ...	THEN write as follows ...	an enlisted qualification is used	Enlisted Qualifications Manual (EQM), COMDTINST M1414.8 (series) A.4.01	a job task analysis panel is used	JTA Panel
IF ...	THEN write as follows ...						
an enlisted qualification is used	Enlisted Qualifications Manual (EQM), COMDTINST M1414.8 (series) A.4.01						
a job task analysis panel is used	JTA Panel						

DIRECTIONS FOR COURSE CONTENT REFERENCE TABLE

STEP	ACTION		
3	IF ...	AND ...	THEN ...
	the course is a rating course	all enlisted quals are covered	insert the word "NONE."
		you have elected NOT to cover a qualification specific to the pay grade <u>Note:</u> If you have difficulty identifying sources of job information and cannot get help from the program manager, let G-PTP know.	get approval from G-WT by— <ul style="list-style-type: none"> • listing the qualification not covered and • identifying the rationale for not teaching the qual. (Each situation will be evaluated on a case-by-case basis.) <u>Note:</u> Do not omit a qual because it is taught in an "A" or "C" school.
		you have covered lower level enlisted qualifications <u>Note:</u> Lower level quals may be covered in courses when the quals are supportive of and necessary for the understanding of the qualifications written for the pay grade of the course.	do not list lower level quals in the curriculum outline and do not test on the lower level quals.
	the course is a specialty course	no quals are covered	enter the following statement: "This is a specialty course and is not required to cover specific goals."

EXHIBITS

EXHIBITS:

(1) TRAINING AIDS/TRAINING EQUIPMENT:

See # 1 (next page)

(2) REFERENCES LISTED IN THE TPOs:

See #2a-2b

(3) TRAINING CENTER PAMPHLETS ISSUED TO THE STUDENT:

See #3

DIRECTIONS FOR EXHIBITS

STEP	ACTION				
1	<p>List all of the items that are specific to the course. If there are none, insert “NONE.” DO NOT list items that are generally used for all correspondence courses. Below is a sample list of acceptable and unacceptable items.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">ACCEPTABLE</th> <th style="width: 50%; text-align: center;">UNACCEPTABLE</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> protractors triangles flash cards maneuvering board </td> <td style="padding: 5px;"> pencils paper text study guide </td> </tr> </tbody> </table>	ACCEPTABLE	UNACCEPTABLE	protractors triangles flash cards maneuvering board	pencils paper text study guide
ACCEPTABLE	UNACCEPTABLE				
protractors triangles flash cards maneuvering board	pencils paper text study guide				
2a	<p>List all references found in the TPOs.</p> <p><u>Note:</u> If you have a large number of references, you may need to use more than one page.</p>				
2b	<p>Arrange the reference titles in alphabetical order. Use the following format:</p> <p style="padding-left: 40px;">title of reference, name of text, chapter, and publication number</p> <p><u>Examples:</u> BASIC Oscilloscope AX-3725-1, Tektronic Inc. EIMB Installation Standards, NAVSHIP 0967-LP-00-0110</p>				
3	<p>List all Institute pamphlets issued to the student followed by the quantity provided for each. Use the following format:</p> <p style="padding-left: 40px;">Teletypewriters and Associated Equipment, CGI #W24504 Qty: 1 per student</p> <p>If pamphlets have not been developed, enter the following statement:</p> <p style="padding-left: 40px;">“Pamphlets will be developed later.”</p>				

DIRECTIONS FOR DETERMINING RESERVE RETIREMENT POINTS

It is the course writer’s responsibility to determine the amount of Reserve Retirement Points that can be earned in a particular course. To do this, you will rate the difficulty of EACH LESSON according to the real world performance of the lesson task (TPO) and the supporting skills and knowledge required to perform that task (EOs). Copy the work sheet on the next page to record your work.

STEP	ACTION														
1	<p>Assign a difficulty factor to each lesson by determining which of the following factors are required to perform the job:</p> <ul style="list-style-type: none"> a. complicated equipment b. job aid/references c. thorough technical knowledge d. thorough knowledge of laws/statutes/federal regulations 														
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">IF job requires . . .</th> <th style="width: 33%;">AND . . .</th> <th style="width: 33%;">THEN assign . . .</th> </tr> </thead> <tbody> <tr> <td>none or one factor</td> <td style="text-align: center;">-----></td> <td>1 point</td> </tr> <tr> <td>two factors</td> <td style="text-align: center;">-----></td> <td rowspan="2">2 points</td> </tr> <tr> <td>three factors</td> <td>does not require both c and d requires BOTH c and d</td> </tr> <tr> <td>all four factors</td> <td style="text-align: center;">-----></td> <td>3 points</td> </tr> </tbody> </table>	IF job requires . . .	AND . . .	THEN assign . . .	none or one factor	----->	1 point	two factors	----->	2 points	three factors	does not require both c and d requires BOTH c and d	all four factors	----->	3 points
IF job requires . . .	AND . . .	THEN assign . . .													
none or one factor	----->	1 point													
two factors	----->	2 points													
three factors	does not require both c and d requires BOTH c and d														
all four factors	----->	3 points													
	<p><u>Note:</u> Most lessons are expected to have a difficulty of 2. If there is reasonable doubt about assigning 3 points to a particular lesson, then assign 2 points.</p>														

DIRECTIONS FOR DETERMINING RESERVE RETIREMENT POINTS

STEP	ACTION
4	Locate difficulty total score from the table below and assign the corresponding Reserve Retirement Points (RRP).
5	Enter Course Reserve Retirement Points on Cover Page.

DIFFICULTY TOTAL SCORES

Diff Total	RRP	Diff Total	RRP
50-	34	22	21
46-49	33	21	20
42-45	32	19, 20	19
40, 41	31	18	18
37-39	30	17	17
35, 36	29	16	16
33, 34	28	15	15
31, 32	27	14	14
29,30	26	13	13
28	25	12	12
26, 27	24	11	11
25	23	10	10
23, 24	22	9	9

CURRICULUM OUTLINE FORMAT SPECIFICATIONS

Component	Font	Point Size	Type*
Cover Page:			
Title (top line)	Times	14 point	Upper Case
Review Date	Times	12 point	Upper & Lower Case
All other lines	Times	12 point	Upper Case
Pages Other Than Cover:			
Title	Times	14 point	Upper Case
Subtitles	Times	12 point	Upper Case
Text	Times	12 point	See sample pages.

*See sample pages for underlining.

SAMPLE CURRICULUM OUTLINE COVER

CURRICULUM OUTLINE

FOR

BOATSWAIN'S MATE, THIRD CLASS COURSE

SHORT TITLE: BM3 COURSE CODE: 0390-4

34 RESERVE RETIREMENT POINTS

CLASSIFICATION: UNCLASSIFIED

DEVELOPED BY

U.S. COAST GUARD TRAINING CENTER

YORKTOWN, VIRGINIA

FREQUENCY OF REVIEW TRIENNIAL

REVIEWED AND APPROVED AT
U.S. COAST GUARD HEADQUARTERS
WASHINGTON, DC

SUBMITTED:

DATE

CHIEF, OPERATIONS BRANCH

FORWARDED:

DATE

TRAINING OFFICER,
TRACEN YORKTOWN

REVIEWED:

DATE

PROGRAM MANAGER

APPROVED:

DATE

TRAINING MANAGER

Next Review Date: _____

SAMPLE TABLE OF CONTENTS

TABLE OF CONTENTS	
<u>SUBJECT</u>	<u>PAGE</u>
Summary of Curriculum Revisions	3
Mission and Scope Statements	4
Units of Instruction, Terminal Performance Objectives (TPOs), and Enabling Objectives (EOs)	5
Course Content Reference Table	37
Exhibits	38
(1) Training Aids/Training Equipment	
(2) References Listed in the TPOs	
(3) Training Center Pamphlets Issued to the Students	

2

SAMPLE SUMMARY OF CURRICULUM REVISION

SUMMARY OF CURRICULUM REVISION

COURSE NAME, CODE, AND EDITION: Damage Controlman First Class 0115-5

CHANGES PROPOSED: _____ DESCRIPTION _____

ELIGIBILITY REQUIREMENTS:..... _____ NONE _____

PREREQUISITES: _____ NONE _____

CONTENT: Subjects removed because enlisted qualifications have been deleted: diagrams and sketching; repairing plumbing fixtures; conditions and hazards for welding; duties of on-scene leader; test and inspection of anchor windlass; in charge of anchor detail; stability principles. New subjects added to cover enlisted qualifications: laying masonry hazards and handling asbestos; carbon arc processes; safety precautions for all welding processes; repair locker leader; damage control plot board; stow and inventory of CBR equipment; set up and operate decontamination station; organize CBR monitoring and decontamination teams.

LENGTH: _____ 36 months _____

EQUIPMENT: _____ NONE _____

FUNDING: Costs to develop correspondence courses to support the advancement system currently average \$5.00 per camera-ready page. This cost does not factor in salaries or the cost of reproduction.

LIMITING FACTORS: _____ NONE _____

QUALIFICATION CODE

AUTHORIZED: _____ NONE _____

REASONS FOR CHANGES PROPOSED: Material removed has been deleted. New material added to cover new enlisted qualifications.

SAMPLE SUMMARY OF NEW CURRICULUM

SUMMARY OF NEW CURRICULUM

COURSE NAME, CODE, AND EDITION: Damage Controlman First Class 0115-5

CURRICULUM PROPOSED:

DESCRIPTION

ELIGIBILITY REQUIREMENTS:..... NONE

PREREQUISITES: NONE

CONTENT: Subjects in this course include: laying masonry hazards and handling asbestos; carbon arc processes; safety precautions for all welding processes; repair locker leader; damage control plot board; liquid load diagram; stability terms; CHRIS, hazardous material; stow and inventory of CBR equipment; set up and operate decontamination station; organize CBR monitoring and decontamination teams.

LENGTH: 36 months

EQUIPMENT: NONE

FUNDING: Costs to develop correspondence courses to support the advancement system currently average \$5.00 per camera-ready page. This cost does not factor in salaries or the cost of reproduction.

LIMITING FACTORS: NONE

QUALIFICATION CODE

AUTHORIZED: NONE

REASONS FOR

PROPOSED COURSE:..... This course has been developed in accordance with the Enlisted Qualifications Manual, COMDTINST M1414.8 (series).

SAMPLE MISSION AND SCOPE STATEMENTS

MISSION AND SCOPE STATEMENTS

NAME OF COURSE: Boatswain's Mate Third Class (BM3)

MISSION: The purpose of this course is to provide the knowledge necessary to perform at the Boatswain's Mate Third Class level as stated in the Enlisted Qualifications Manual, COMDTINST M1414.8 (series).

SCOPE: This course consists of pamphlets and an end-of-course test (EOCT) provided in a nonresident, self-study format. Subject matter is specifically designed for seaman (E-3) as a required component for advancement to BM3. The course covers selected subjects in administration (maintenance of records and logs), seamanship and deck maintenance, piloting and navigation, and personnel supervision. The pamphlets include reading assignments with objectives to be mastered and appropriate review exercises specifically designed to test mastery of the objectives. The student must achieve a minimum score of 80 percent on the EOCT to successfully complete the course.

PREREQUISITES: NONE

QUALIFICATION CODE ELIGIBILITY: NONE

STUDENT SECURITY CLASSIFICATION: NONE

SAMPLE UNIT PAGE

UNIT 1.0 ADMINISTRATION

TERMINAL PERFORMANCE OBJECTIVE:

- 1.1 Given the following list of records and logs, **IDENTIFY** the recommended information for maintaining the records and logs in accordance with Instruction for Abstract of Operations Report, COMDTINST 3123.7; Coating and Color Manual, COMDTINST M10360.3 (series); Naval Engineering Manual, COMDTINST M9000.6 (series); and Boatswain's Mate 3&2, NAVEDTRA 10121-G1:
- a. Unit Small Boat Logs
 - b. Paint Log
 - c. Anchor Log
 - d. Hull History Card

ENABLING OBJECTIVES:

- 1.1.1 Given a list of statements, **SELECT** the statement that describes the purpose for keeping the paint record aboard ship and ashore in accordance with Coating and Color Manual, COMDTINST M10360.3 (series).
- 1.1.2 Given a list of statements, **SELECT** necessary information to maintain paint records aboard ship and ashore in accordance with Coating and Color Manual, COMDTINST M10360.3 (series).
- 1.1.3 Given a list of statements, **SELECT** the statement that describes the purpose for keeping the anchor log aboard ship in accordance with Naval Engineering Manual, COMDTINST M9000.6 (series), and Boatswain's Mate 3&2, NAVEDTRA 10121-G1.

SAMPLE COURSE CONTENT REFERENCE TABLE

COURSE CONTENT REFERENCE TABLE

TPOs	REQUIREMENT JUSTIFICATION
1.1	Enlisted Qualifications Manual (EQM) (M1414.8B) EQM: A.4.01
2.1	EQM: B.4.02
3.1	EQM: C.4.01
3.2	EQM: C.4.01
3.3	EQM: C.4.01
3.4	EQM: C.4.01
3.5	EQM: C.4.02
3.6	EQM: C.4.03
3.7	EQM: C.4.04
3.8	EQM: C.4.05
3.9	EQM: C.4.06
3.10	EQM: C.4.06
3.11	EQM: C.4.07
3.12	EQM: C.4.08
4.1	EQM: D.4.01
4.2	EQM: D.4.03
4.3	EQM: D.4.02
5.1	EQM: G.4.01

ENLISTED QUALIFICATIONS NOT COVERED:

B.4.01 This performance qualification is covered during the boat crew qualification process outlined in COMDTINST 16114.9 (series). This process is an on-the-job study/application and validation process composed of practical small boat type specific tasks and some non-type specific tasks generic in nature to small boat operations. Completion of this process requires both demonstrated knowledge and observable application. The level of performance required cannot be achieved through a nonresident course of instruction.

SAMPLE EXHIBITS

EXHIBITS:

(1) TRAINING AIDS/TRAINING EQUIPMENT:

Nautical Charts

NavKit: Dividers, Compass, Parallel Rules, Weem's Plotter,
Nautical Slide Rule

(2) REFERENCES LISTED IN THE TPOs:

Boat Crew Qualification Guide, COMDTINST M16114.10 (series)

Boat Crew Seamanship Manual, COMDTINST M16114.5 (series)

Boat Crew Training Program, COMDTINST M16114.9 (series)

Boatswain's Mate 3 & 2 Manual, NAVEDTRA 10121-G1

Coast Guardsman's Manual

Coatings and Color Manual, COMDTINST M10360.3 (series)

Enlisted Performance Evaluation Form (CG-3788A)

Naval Engineering Manual, COMDTINST M9000.6 (series)

Organization and Regulations Manual, CG-260

Seaman Manual, NAVEDTRA 10120-H

Shipboard Helicopter Operational Procedures, COMDTINST M3710.2

(3) TRAINING CENTER PAMPHLETS ISSUED TO THE STUDENT:

Administration, Watch Standing, and Personnel Supervision Pamphlet,

Qty: 1 per student

Deck Seamanship Pamphlet, Qty: 1 per student

Navigation and Piloting Pamphlet, Qty: 1 per student

Sampson Cordage Splicing Manual, Qty: 1 per student

Marlinespike Seamanship Pamphlet, Qty: 1 per student

Appendix C

TEST DEVELOPMENT

Test Development Process

Overview

The purpose for testing is to find out how well the instructional material and learning process is working. Performance-based criterion referenced tests require students to demonstrate performance only on the objectives. Therefore, the students are being tested only on what they need to know to perform their job.

The principles underlying testing in the course development process are based on the achievement of objectives. Tests are given to determine whether an individual student has reached the criterion specified in an objective.

The test development process is designed to provide the necessary review and feedback within the course to ensure that the students will be able to achieve the objectives. Therefore, the course must provide relevant practice in the text material to prepare the student to answer the self-quiz/topic review and pamphlet review quiz questions. The pamphlet review quiz prepares the student to take the end-of-course test (EOCT). The successful completion of the EOCT is one step toward qualifying to take the servicewide exam.

Lesson self-quizzes/topic review, pamphlet review quizzes, and end-of-course tests are all criterion-referenced. The servicewide exam, on the other hand, is a norm-referenced test that is based on the Enlisted Performance Qualifications and is developed to identify those candidates best qualified for advancement on the basis of rate-related/required knowledge and performance.

Outline

When developing a course, you will be creating three types of tests. A fourth type is based on the Enlisted Performance Qualifications and is linked with the Coast Guard promotion system. All four types of tests are discussed in this section, followed by a section on test strategy and statistics.

- **Self-Quiz (sometimes referred to as Topic Review or Practical Exercise)**
 - Pamphlet Review Quiz
 - End-of-Course Test (EOCT)
 - Servicewide Exam (SWE)
 - Test Strategy and Statistics
-

Self-Quiz/Topic Review

Introduction

A self-quiz/topic review follows each lesson in the text to reinforce the lesson objectives and the reading material. The self-quiz/topic review should be carefully designed as a working review of each objective. The test items you develop on your self-quiz/topic review are limited to paper-and-pencil exercises that will help determine the student's ability to recognize and recall facts and apply principles, processes, procedures, and concepts specified in the lesson objectives.

Requirements

To help the student get actively involved with the course material, a lesson self-quiz/topic review should:

- Cover all the lesson objectives thoroughly.
 - Follow the same sequence as the reading material.
 - Be clearly supported by the text and referenced by a page number.
 - Develop the review by small steps to provide for recall, develop understanding, and solve problems.
 - Contain a correct answer for each test item.
-

Answer Key

After answering an item on a self-quiz/topic review, the student checks the answer on the answer key that follows. To develop a functional answer key, include the following:

- Make sure the answers satisfy the requirements of the test items.
 - Do not introduce new factors not found in the item.
 - Place the answers in sequential order.
 - Make the answers clear and comprehensive.
 - Do not make the answers visible when the student is completing the quiz.
 - Include reference page numbers where the information can be found in the text.
-

Self-Quiz/Topic Review

Procedure

The development of a self-quiz/topic review involves teamwork. The procedure is listed below.

Step	Action	Responsibility
1	List lesson objectives.	Subject Matter Specialist (SMS)
2	Research subject matter.	SMS
3	Develop quiz items (with illustrations as necessary).	SMS
4	Develop answer key.	SMS
5	Review quiz for consistency with lesson objectives.	Instructional Systems Specialist (ISS)
6	Conduct edit of quiz and answer key.	Writer/Editor (W/E)
7	Make appropriate changes.	SMS
8	Print camera-ready copy and add to end of lesson text.	SMS
9	Continue with block 8 of the course development procedure chart. (See section 7 of this manual.)	SMS

Note: Depending on the training source and staffing billets, the above responsibilities of the ISS and/or W/E could be performed by other staff.

Self-Quiz/Topic Review

Sample Self-Quiz

May also be called Topic Review or Practical Exercise

Lesson 1 Self-Quiz

Questions

1. List the three purposes for organizing a paint job.

1) _____

2) _____

3) _____

May also be a., b., c., etc.

2. Recording the progress of a paint job is the responsibility of the _____.

- A. first lieutenant
- B. paint locker foreman
- C. supervisor
- D. deck worker

3. Match the paint in column A with its characteristics in column B. A paint may have more than one characteristic.

Column A

Column B

____ 1. Mare Island Epoxy

a. Fire retardant paint used on interior bulkheads overheads, and on machinery.

____ 2. Chlorinated Alkyd Resin

b. Paint containing a two-part kit. The two parts are mixed 1:1.

____ 3. Interior Gloss Alkyd

c. Paint is especially desirable on surfaces exposed to frequent scrubbing.

____ 4. Silicone Alkyd Enamel

d. Used on underwater bodies constructed of steel, wood, and fiberglass.

e. Highly weather resistant.

Self-Quiz/Topic Review

Sample Self-Quiz Answer Key

May also be called Answers to
Topic Review or Practical Exercise.

Answers to Self-Quiz

Question	Answer	Reference
1	1) Promotes safety 2) Saves time and material 3) Workers know what is expected	1-1
2	C	1-2
3	1. b 2. a 3. c 4. e	1-3

Pamphlet Review Quiz

Introduction

The pamphlet review quiz should be designed to continue the same instructional process as the lesson self-quiz/topic review. However, the pamphlet review quiz has another function--to prepare the student for taking the EOCT. For this reason, the format of the pamphlet review quiz is limited to multiple-choice items.

Requirements

Some basic requirements of the pamphlet review quiz are:

- Items should sample only the lesson objectives listed.
 - Information not covered by an objective should not be introduced in the item.
 - Items should be clearly supported by the text and referenced by page number.
 - Items must be criterion-referenced in a four-response, multiple-choice format.
 - Correct answers must be located on a different page from the quiz.
 - Items should be based on the same standards used on EOCT items.
-

Answer Key

The requirements for developing the answer key for the pamphlet review quiz include the same requirements listed for self-quiz. In addition, the answer key should be presented in double column unless the pamphlet review quiz is short.

Pamphlet Review Quiz

Test Items

The self-quiz/topic review covers all lesson objectives thoroughly, whereas the pamphlet review quiz only samples those objectives. To develop items for the review quiz, you can convert the self-quiz/topic review items to the multiple-choice format.

Example:

Lesson Objective: **CONVERT** ZT to GMT.

Self-quiz item: Your ship is in longitude $125^{\circ} 35'$ W and ZT is 08h 25m. What is GMT? _____

Pamphlet review quiz item: Your ship is in longitude $125^{\circ} 35'$ W and ZT is 08h 25m. What is GMT?

- A. 00h 35m
 - B. 08h 25m
 - C. 16h 25m
 - D. 20h 35m
-

Pamphlet Review Quiz

Procedure

The pamphlet review quiz is developed to sample the lesson objectives and to serve as a practice for the EOCT. The procedure is listed below.

Step	Action	Responsibility
1	Plan pamphlet review quiz strategy.	Subject Matter Specialist (SMS)
2	List lesson objectives.	SMS
3	Research subject matter.	SMS
4	Develop pamphlet review quiz (with illustrations as necessary).	SMS
5	Develop answer key.	SMS
6	Review pamphlet review quiz for consistency with lesson objectives.	Instructional Systems Specialist (ISS)
7	Make appropriate changes.	SMS
8	Conduct edit of pamphlet review quiz and answer key.	Writer/Editor (WE)
9	Make appropriate changes.	SMS
10	Print camera-ready copy and add to end of pamphlet.	SMS

Note: Depending on the training source and staffing billets, the above responsibilities of the ISS and/or W/E could be performed by other staff.

Pamphlet Review Quiz

Sample Pamphlet Review Quiz

Appendix A

PAMPHLET REVIEW QUIZ

1. Movement can be measured in terms of _____.
 - A. direction and distance
 - B. distance and speed
 - C. direction and speed
 - D. speed and time
2. The movement that takes place when an object changes positions in relation to a fixed reference point is known as ____ movement.
 - A. ground
 - B. relative
 - C. directional
 - D. true or actual
3. The movement that takes place between two ships when one or both are moving is known as ____ movement.
 - A. relative
 - B. directional
 - C. geographical
 - D. true or actual
4. Which of the following is an example of relative motion?
 - A. A train traveling from Key West, FL to Bangor, ME
 - B. A speeding automobile passing a motorcycle
 - C. A ship sailing around the world
 - D. A person walking 5 miles
5. What is an imaginary line of direction across the water or land to an object such as a ship?
 - A. Line of position
 - B. Line of sight
 - C. Bearing
 - D. Angle
6. Relative bearings are measured clockwise from _____.
 - A. ship's true direction
 - B. ship's head
 - C. imaginary north
 - D. true north
7. What is the relative bearing of a contact that is broad on the starboard quarter of own ship?
 - A. 225°R
 - B. 190°R
 - C. 135°R
 - D. 090°R
8. Own ship's heading is 260°T. Your radar picks up a contact bearing 100°T. What is the relative bearing of the contact?
 - A. 360°R
 - B. 240°R
 - C. 200°R
 - D. 185°R

Pamphlet Review Quiz

Sample Pamphlet Review Quiz Answer Key

Appendix B

PAMPHLET REVIEW QUIZ - ANSWER KEY

QUESTION	ANSWER	REFERENCE	QUESTION	ANSWER	REFERENCE
1	D	1-3	20	A	2-8
2	D	1-4	21	C	2-8
2	B	1-4	22	C	2-8
4	B	1-4	23	C	2-12
5	C	1-8	24	B	2-14
6	B	1-8	25	D	2-14
7	C	1-10	26	C	2-15
8	C	1-11	27	A	3-3
9	D	1-11	28	C	3-5
10	A	1-13	29	A	3-8
11	D	1-13	30	C	3-14
12	A	1-14	31	C	4-3
13	A	1-15	32	B	4-3
14	D	1-16	33	C	4-3
15	C	1-16	34	C	4-7
16	A	1-16	35	A	4-12
17	B	2-3	36	A	4-17
18	D	2-7	37	D	5-3
19	B	2-7	38	A	5-3

B-1

End-of-Course Test

Introduction

Besides the reinforcement "tests" used in the pamphlets, the Coast Guard uses a final examination--an "end-of-course test (EOCT)"--to measure the student's achievement of the performance objectives. The EOCT is a proctored examination completed at one sitting with no time limit. The test is scored at the Coast Guard Institute. The students may now find their test scores through the Coast Institute's web site. Unit ESOs can provide specific instructions on obtaining scores through this web site.

If students pass, they receive a letter of completion. If they fail, they receive a profile letter showing their scores on individual sections of the test. Another test is sent, and the student must be reexamined and receive the established passing score on the EOCT to be eligible for the servicewide examination.

Requirements

The basic requirements for writing the EOCT are:

- Each item should be written and entered into the EOCT test item database.
- Each item must measure a performance objective.
- The information tested must be covered in the text and the location of that information is noted in the item bank.
- All items must be written in the four-response, multiple-choice format.
- Each test should be divided into sections. Minimum section length is four items; section titles should be provided. (Student profile letters will be developed from this information.)
- Two completely separate but parallel tests will be prepared. (A third test will be developed from this information.)
- Test length will vary, depending on course size. Normal ranges are 25 to 100 items.
- Each test must end on an even-numbered page. Include page with **"THIS PAGE INTENTIONALLY LEFT BLANK"** if last test item ends on odd-numbered page.

Note: The test item database will include these words **"STOP. END OF TEST."** automatically in the footer on page with last question.)

End-of-Course Test

Procedure

The EOCT is developed to sample the TPOs and EOs, which are based on the enlisted performance qualifications. The procedure is listed below.

Step	Action	Responsibility
1	List TPOs and EOs.	Subject Matter Specialist (SMS)
2	Research subject matter.	SMS
3	Select test items from the EOCT test item database for selected performance objectives.	SMS
4	Develop versions 1 and 2 (with illustrations as necessary).	SMS
5	Conduct first edit.	Writer/Editor (W/E)
6	Make appropriate changes.	SMS
7	Review versions 1 and 2 for each curriculum outline objective.	Instructional Systems Specialist (ISS)
8	Make appropriate changes.	SMS
9	Print camera-ready copy for versions 1 and 2.	SMS
10	Conduct camera-ready edit.	W/E
11	Make appropriate changes.	SMS
12	Create version 3 (repeat steps 5 through 11).	SMS
13	Complete answer sheet and handscoring template.	SMS

End-of-Course Test

Procedure (Continued)

Step	Action	Responsibility
14	Complete score key change/profile sheet.	SMS
15	Complete course/inventory control sheet.	SMS
16	Send all versions, answer sheets, etc., to CGI via Registered/Express mail.	SMS
17	Complete 100% test.	SMS
18	Mail answers for 100% test to CGI.	SMS

Note: Depending on the training source and staffing billets, the above responsibilities of the ISS and/or W/E could be performed by other staff.

Design Principles

The principles of designing the tests include the following:

- Related to the Job. The test must be highly related to what students will do on the job. It must sample the same knowledge and performance the students will be required to use on the job.
 - Sample the Student's Ability to Perform. Remember that when you write the test items you are sampling the ability of the student to perform paper and pencil versions of actual tasks. The test items should require the students to make the same types of decisions they will make on the job. If the job is to fill in forms, the test item should require the student to identify a proper entry on the form or to convert general information into coded information for the form.
 - Predictor of Success on the Job. The EOCT is only a sample of what the student has learned. Because of the limitations of the multiple-choice, paper-and-pencil test, the test will not show the total knowledge and performance the student has gained from the course. Although the number of items on the test will vary, a well-designed test will be a fairly accurate predictor for most students as the four-response format will reduce the possibility of the student guessing successfully. The test will predict success on the job, but it will not guarantee success.
-

End-of-Course Test

EOCT Numbering

Each EOCT series contains three separate tests. The procedures for numbering EOCT are discussed below.

IF the EOCT is . . .	THEN . . .
the first edition	begin with tests numbered form 51, 52, and 53.
being credited at least 10 percent	<ul style="list-style-type: none"> • develop a new series of exams and • begin with tests numbered form 54, 55, and 56 <p><u>Note:</u> The next series will be numbered form 57, 58, and 59, followed by series numbered form 60, 61, and 62 with a final series number of 99. Then restart with 51.</p>
a confirmed compromise	continue with the next three series (form) numbers.
a new edition series of exams	renumber starting again with form 51, 52, and 53.

End-of-Course Test

EOCT Construction

To make up the three forms of the test (51, 52, and 53), follow the procedures outlined below.

- Write items of equal difficulty for forms 51 and 52. When you write item 1 for form 51, write a parallel item 1 for form 52. Both items should test the same performance objective and should be of equal difficulty. However, they must be different questions. A rewrite of the item used in form 51 is not advisable for use on form 52.
- Select items that have been adequately reviewed. The items selected from your item database for the EOCT must be reviewed at the lesson self-quiz/topic review level and may be reviewed again at the pamphlet review quiz level.
- Combine forms 51 and 52 to make form 53. To make the third form of the test, you will begin with a new item, followed by the first half of form 51 and the second half of form 52, dropping the last item of form 52. This will prevent a compromise of the test by requiring a different answer key.

Note: For those using the new Gemini test item database, the third form of the test (53) may be randomly generated from the database test items.

EOCT Package

After the test development process is completed, mail the following completed items by Registered/Express mail to CGI. Sample items required in the EOCT package are included from pages 5-17 through 5-23.

- Properly formatted, camera-ready copy of the EOCT. Format will depend on whether the test is unclassified or classified. See samples for variations. All EOCTs must end on an even-numbered page; therefore, the test may require a blank page.
- Correspondence Course Answer Sheet (CGI-2800). You must complete an answer sheet for each test form (51, 52, 53) for use as a computer grading key. Enter the course writer's name and rank/rate on the first two lines. Enter the short title and edition of the course on the Course Title line. Enter the following information in the blocks and darken the appropriate circles:

Social Security Number Enter 000 00 0005.

Course Code

Edition

Test No. Enter 51, 52, or 53 as appropriate.

End-of-Course Test

EOCT Package (Continued)

To fill in the responses, darken the circle that corresponds with the correct response for each item.

- Hand-Scoring Template (CGI-2800A). One hand-scoring template (CGI-2800A) is prepared for each test. Use the one-hole punch to remove #1 and #100 so that you can align the template over the answer sheet. Punch out the correct response for each item.
- EOCT Score Key Change/Profile Sheet (CGI-2801). This form is used to:
 - ⇒ Issue a new EOCT.
 - ⇒ Keep an inventory of the number of EOCTs.
 - ⇒ Identify the section titles and indicate the total number of questions in each section.
 - ⇒ Make changes to EOCT items (i.e., deleting items or changing the answers of individual items).
 - ⇒ Recap EOCT credited items.
 - ⇒ Make computer grading key changes.
- Course and Inventory Control Sheet - Create Modify Course (CGI-2834). This sheet is submitted if your course is a new course or new edition of an old course.

The EOCT answer sheet, template, and profile sheet are not complex; however, they must be completed correctly to enter the information on the computer.

End-of-Course Test

Sample EOCT

<p>Times Bold 12 pt.</p>	<p>FOR OFFICIAL USE ONLY QM3 (3rd) 0337-51 COMMUNICATIONS</p>	<p>5. To acknowledge the receipt of a message on a sound-powered telephone, you should say "_____."</p> <p>A. AFFIRMATIVE B. AYE, AYE C. ROGER D. ON THE LINES</p>
<p>Times 12 pt.</p>	<p>1. In the Northern Hemisphere, the semipermanent subtropical highs move southward during the _____ months.</p> <p>A. winter B. autumn C. summer D. spring</p>	<p>6. The Geostrophic Wind Method uses the surface and 700-mb levels to forecast the movement of _____.</p> <p>A. isobars B. highs C. fronts D. isotherms</p>
<p>Double Space</p>	<p>2. When you use the thermal wind between the 1,000- and 700-mb levels to indicate the speed of a surface low, the low's speed is approximately _____ of the thermal wind's speed.</p> <p>A. 90% B. 75% C. 50% D. 30%</p>	<p>7. What is the most intensive and effective cooling process?</p> <p>A. Frontal lifting B. Orographic lifting C. Horizontal divergence D. Vertical stretching</p>
<p>Double Space</p>	<p>3. To objectively predict the 24-hour movement and change in intensity of maritime low pressure systems, you should use height and temperature measurements from the _____ level.</p> <p>A. 1,000-mb B. 850-mb C. 500-mb D. 350-mb</p>	<p>8. The most important factor in short-range terminal forecasting is the accuracy of _____.</p> <p>A. area B. time C. distance D. direction</p>
<p>Times Bold 12 pt.</p>	<p>4. In the upper atmosphere over a developing low, the isopycnic level is generally considered to be at the _____ level.</p> <p>A. 200-mb B. 350-mb C. 450-mb D. 600-mb</p>	<p>9. In the Northern Hemisphere, the most extensive and dense cirrus clouds occur on the high pressure side or _____ of the jet stream axis.</p> <p>A. west B. east C. south D. north</p>
<p>1</p>		<p>GO ON TO THE NEXT PAGE FOR OFFICIAL USE ONLY</p>

End-of-Course Test

Sample Confidential EOCT

Times Bold 12 pt.

CONFIDENTIAL
FT2 (2nd Ed.) 0337-51

COMMUNICATIONS

Times Bold 10 pt.

Times 12 pt.

1. (U) In the Northern Hemisphere, the semipermanent subtropical highs move southward during the ____ months.

- A. winter
- B. autumn
- C. summer
- D. spring

2. (U) When you use the thermal wind between the 1,000- and 700-mb levels to indicate the speed of a surface low, the low's speed is approximately ____ of the thermal wind's speed.

- A. 90%
- B. 75%
- C. 50%
- D. 30%

3. (U) To objectively predict the 24-hour movement and change in intensity of maritime low pressure systems, you should use height and temperature measurements from the ____ level.

- A. 1,000-mb
- B. 850-mb
- C. 500-mb
- D. 350-mb

5. (U) To acknowledge the receipt of a message on a sound-powered telephone, you should say "_____."

- A. AFFIRMATIVE
- B. AYE, AYE
- C. ROGER
- D. ON THE LINES

6. (U) The Geostrophic Wind Method uses the surface and 700-mb levels to forecast the movement of ____.

- A. isobars
- B. highs
- C. fronts
- D. isotherms

7. (U) What is the most intensive and effective cooling process?

- A. Frontal lifting
- B. Orographic lifting
- C. Horizontal divergence
- D. Vertical stretching

8. (U) The most important factor in short-range terminal forecasting is the accuracy of ____.

- A. area
- B. time
- C. distance
- D. direction

9. (U) In the Northern Hemisphere, the most extensive and dense cirrus clouds occur on the high pressure side or ____ of the jet stream axis.

- A. west
- B. east
- C. south
- D. north

Double Space

4. (U) In the upper atmosphere over a developing low, the isopycnic level is generally considered to be at the ____ level.

- A. 200-mb
- B. 350-mb
- C. 450-mb
- D. 600-mb

Times Bold 12 pt.

1

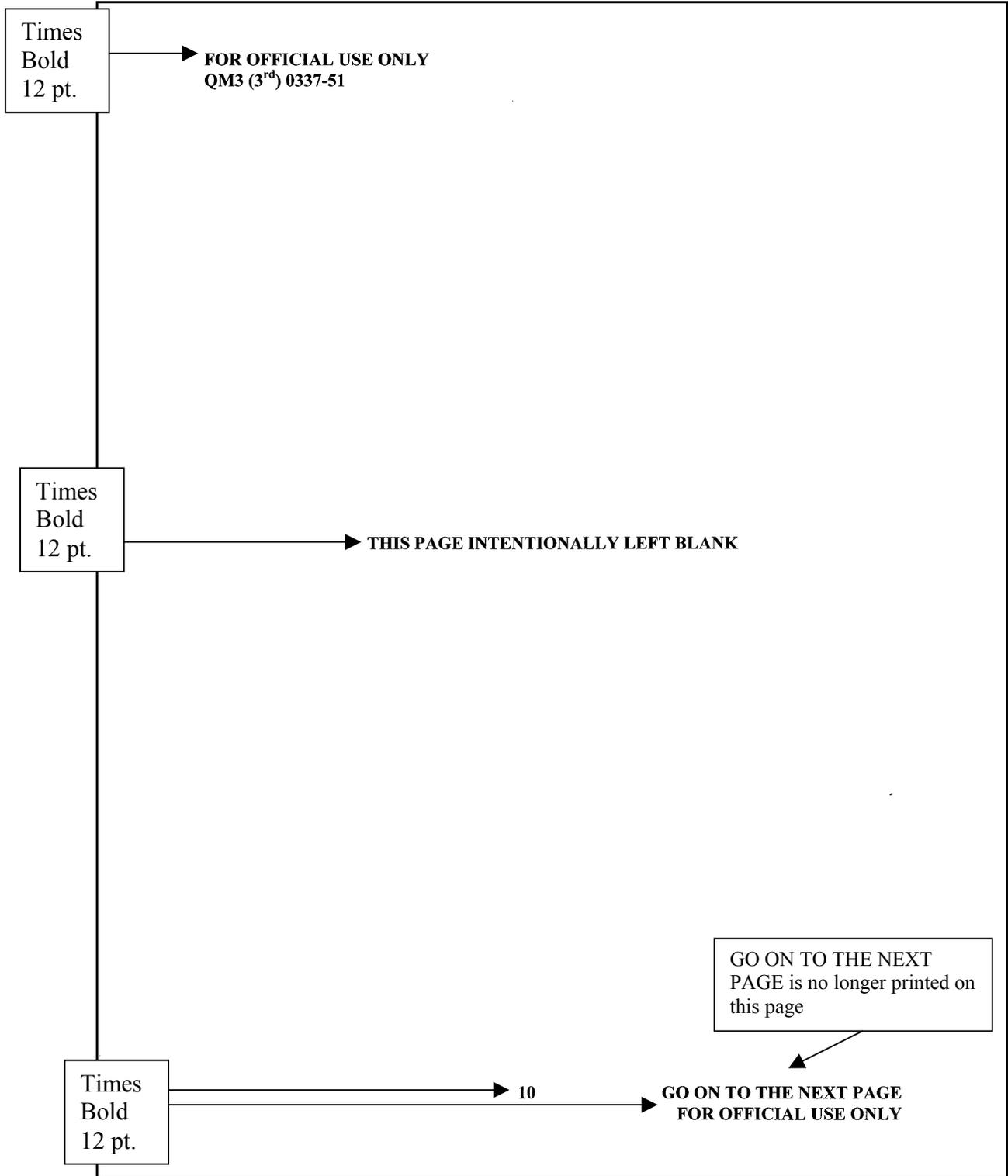
GO ON TO THE NEXT PAGE

CONFIDENTIAL

Times Bold 10 pt.

End-of-Course Test

Sample EOCT Blank Page



Note: The test item database was updated to eliminate “GO ON TO THE NEXT PAGE” from this page.

End-of-Course Test

Correspondence Course Answer Sheet (CGI-2800)

DEPARTMENT OF TRANSPORTATION UNITED STATES COAST GUARD FORM CGI - 2800 (1-99)	UNITED STATES COAST GUARD INSTITUTE CORRESPONDENCE COURSE ANSWER SHEET																																																																																																																																																																																																																																																	
STUDENTS: Fill in blanks completely. Make your marks with a No. 2 black lead pencil. Enter in the designated blocks your social security number, course code number, edition of course book, lesson or test number, and OPFAC number. Next carefully fill in the numbers opposite the blocks you have just marked. Answer spaces are arranged in vertical sequence. Make only one mark to answer one question. To avoid erasures, at first mark your selection lightly or with a small dot. Then, after you are satisfied no changes will be made, darken circles carefully.	EXAMPLE: WRONG 1 (A) (B) (C) (D) (E) WRONG 2 (A) (B) (C) (D) (E) WRONG 3 (A) (B) (C) (D) (E) RIGHT 4 (A) (B) (C) (D) (E)																																																																																																																																																																																																																																																	
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PRIVACY ACT OF 1974 A. AUTHORITY FOR USE AND WHETHER MANDATORY OR VOLUNTARY - 14 U.S.C. Sec 633. Voluntary. B. PRINCIPAL PURPOSE - Identify student record. Score test answers. C. ROUTINE USES - Establish score on test. Enter score on student record. D. EFFECT ON YOU IF YOU DO NOT PROVIDE INFORMATION REQUESTED - Your answer sheet will not be scored. You will not achieve course completion.																																																																																																																																																																																																																																																		
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7 (A) (B) (C) (D)	22 (A) (B) (C) (D)	37 (A) (B) (C) (D)	52 (A) (B) (C) (D)	67 (A) (B) (C) (D)	82 (A) (B) (C) (D)	97 (A) (B) (C) (D)	112 (A) (B) (C) (D)																																																																																																																																																																																																																																											
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14 (A) (B) (C) (D)	29 (A) (B) (C) (D)	44 (A) (B) (C) (D)	59 (A) (B) (C) (D)	74 (A) (B) (C) (D)	89 (A) (B) (C) (D)	104 (A) (B) (C) (D)	119 (A) (B) (C) (D)																																																																																																																																																																																																																																											
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End-of-Course Test

EOCT Hand-Scoring Template (CGI-2800A)

1	A	B	C	D	16	A	B	C	D	31	A	B	C	D	46	A	B	C	D	61	A	B	C	D	76	A	B	C	D	91	A	B	C	D	106	A	B	C	D
2	A	B	C	D	17	A	B	C	D	32	A	B	C	D	47	A	B	C	D	62	A	B	C	D	77	A	B	C	D	92	A	B	C	D	107	A	B	C	D
3	A	B	C	D	18	A	B	C	D	33	A	B	C	D	48	A	B	C	D	63	A	B	C	D	78	A	B	C	D	93	A	B	C	D	108	A	B	C	D
4	A	B	C	D	19	A	B	C	D	34	A	B	C	D	49	A	B	C	D	64	A	B	C	D	79	A	B	C	D	94	A	B	C	D	109	A	B	C	D
5	A	B	C	D	20	A	B	C	D	35	A	B	C	D	50	A	B	C	D	65	A	B	C	D	80	A	B	C	D	95	A	B	C	D	110	A	B	C	D
6	A	B	C	D	21	A	B	C	D	36	A	B	C	D	51	A	B	C	D	66	A	B	C	D	81	A	B	C	D	96	A	B	C	D	111	A	B	C	D
7	A	B	C	D	22	A	B	C	D	37	A	B	C	D	52	A	B	C	D	67	A	B	C	D	82	A	B	C	D	97	A	B	C	D	112	A	B	C	D
8	A	B	C	D	23	A	B	C	D	38	A	B	C	D	53	A	B	C	D	68	A	B	C	D	83	A	B	C	D	98	A	B	C	D	113	A	B	C	D
9	A	B	C	D	24	A	B	C	D	39	A	B	C	D	54	A	B	C	D	69	A	B	C	D	84	A	B	C	D	99	A	B	C	D	114	A	B	C	D
10	A	B	C	D	25	A	B	C	D	40	A	B	C	D	55	A	B	C	D	70	A	B	C	D	85	A	B	C	D	100	A	B	C	D	115	A	B	C	D
11	A	B	C	D	26	A	B	C	D	41	A	B	C	D	56	A	B	C	D	71	A	B	C	D	86	A	B	C	D	101	A	B	C	D	116	A	B	C	D
12	A	B	C	D	27	A	B	C	D	42	A	B	C	D	57	A	B	C	D	72	A	B	C	D	87	A	B	C	D	102	A	B	C	D	117	A	B	C	D
13	A	B	C	D	28	A	B	C	D	43	A	B	C	D	58	A	B	C	D	73	A	B	C	D	88	A	B	C	D	103	A	B	C	D	118	A	B	C	D
14	A	B	C	D	29	A	B	C	D	44	A	B	C	D	59	A	B	C	D	74	A	B	C	D	89	A	B	C	D	104	A	B	C	D	119	A	B	C	D
15	A	B	C	D	30	A	B	C	D	45	A	B	C	D	60	A	B	C	D	75	A	B	C	D	90	A	B	C	D	105	A	B	C	D	120	A	B	C	D

CGI-2800A(1-77)

End-of-Course Test

100 Percent Test

After the printed instructor's copy of the EOCT is returned to the training source by CGI, the SMS must take the EOCT and receive a score of 100 percent.

The SMS should take the "100 percent test" using ONLY the instructor's copy of the EOCT and not a previously prepared answer key or other keyed copy of the EOCT. Meticulous attention to this important step will guarantee that a completely accurate answer key is used to score student EOCTs.

Course code, edition, and form number are completed for each EOCT form. Note that this is the "100 percent test" in the name block and leave the social security number blank. The new EOCT cannot be placed on-line until this "100 percent test" has been accomplished.

Statistical Analysis

A statistical analysis should be requested from CGI after a new series of end-of-course tests has been in use long enough to get a reasonable sample (approximately 6 months). The statistical data on the printouts from CGI should be entered in the item bank. The statistical analysis will identify the following information:

- Miskeyed items.
 - Items with two correct answers or an answer that is partially correct.
 - Areas that were not covered adequately in the text.
 - Questions that are poor discriminators.
 - Questions that are too easy/difficult.
 - Unwanted cues in the stem.
 - Unwanted cues in the answers.
-

Crediting Items

Any credited item means that the student receives a correct response regardless of the answer choice.

When an item is credited, nothing happens to the test booklet. The student does not know the item will not be graded. **If more than 10 percent of the items need to be credited, you must write a new series of exams.**

End-of-Course Test

Crediting Items (Continued)

To credit an item, complete a computer key change on the EOCT Score Key Change Profile Sheet (CGI-2801). Once the action has been completed by CGI, an endorsed copy will be returned to the training source. File this copy along with the master copy of the test. You will need this form when revising the test.

Some EOCT items may need to be credited before the test is revised. This could be due to poor performance when analyzed, changing obsolete material in a pamphlet, or any of the reasons covered earlier.

Challenges from Students

Challenges from students are usually received by CGI with the administered EOCT. The student's inquiry will then be forwarded to the training source. The SMS responds to the challenge by mail or e-mail. No test answers are given to the student, but the SMS can reference where the student may find the answer (i.e., see page __).

Note: Copies of replies to students should be filed in the course file maintained by the SMS. Look in this file for sample replies to challenges.

Pass/Fail

Pass/fail scores on course completion/failure letters will reflect the actual pass/fail percentage (%) score established by the subject matter specialist (SMS) (and rating force manager) responsible for the course. SMSs have set the pass/fail score on the majority of EOCTs at 76% or 80% (i.e., 76 or 80 correct out of 100 questions). However, EOCT pass/fail percentage scores can range from 66% - 98%.

Actual Score

Students passing an EOCT will receive the actual score achieved on the test regardless of the number of times they take the EOCT. No longer will a student receive a maximum score of 80%, regardless of score achieved, on a second or subsequent EOCT.

Auxiliary EOCT

Commandant (G-OCX) is the program/training manager for all auxiliary correspondence courses and EOCTs. CGI will continue to score end-of-course tests that are available to Coast Guard auxiliaries through their local Director of Auxiliary. The score keys for these EOCTs will continue to be supplied by Commandant (G-OCX) to CGI. EOCTs and auxiliary correspondence course pamphlets will not be stocked by CGI.

Servicewide Examination

Introduction

The Enlisted Qualifications Manual, COMDTINST M1414.8 (series), serves as the basis for the development of the servicewide examination (SWE). The manual prescribes the minimum occupational and military standards, expressed in enlisted performance qualifications, for advancement in rate. The SWE is the final phase of the advancement competition. The main goal of the SWE is to identify those candidates best qualified for advancement on the basis of rate-related/required knowledge and performance. The SWE is a norm-referenced examination. Commandant sets the minimum acceptable percentage for each examination. The candidate's name appears on the advancement list in order of the final multiple score, which is a combination of time in service, time in grade, medals and awards, marks, and servicewide exam score.

Components

Each servicewide exam is divided into the following two basic parts:

- Part I - Professional. Knowledge and performance relevant to the total field of the rate. Many different section topics particular to the rate may be addressed.
- Part II - Military Requirements (MRNs). Requirements common to all ratings in each paygrade.

Note: MRN in the near future will be called E-PME (Enlisted - Professional Military Education).

Requirements

The following requirements are specified for writing SWE items:

- All SWEs will be created by appropriate rating E-9s.
 - Under no circumstances will individuals have access to any examination component for examinations in which they could participate.
 - Each SWE consists of 150 items (questions).
 - All items must be written in the four-response, multiple-choice format.
 - All newly created SWE test items must be approved by the ISS and W/E prior to being used on a SWE. (Depending on the training source and staffing billets, other staff could perform this responsibility.)
 - Every SWE item in the Professional and Military Requirements parts must test a performance-based qualification required by COMDTINST M1414.8 (series) of the target rate or any lower rate.
-

Servicewide Examination

Requirements (Continued)

- Every item must have a written reference, which confirms the correctness of the item. Each reference must be either:

⇒ An official directive applicable throughout the Coast Guard.

Examples: Coast Guard publications, Commandant Instructions, or other documents listed in COMDTNOTE 5600.

or

⇒ A generally accepted source of information.

Examples: Dutton's "Navigation and Piloting," "Gray's Anatomy," or a manufacturer's instruction book.

Part Size Requirements

The size of each part of an examination is depicted below. Part size for Professional and Military Requirements parts will vary depending on paygrade.

Part	Part Size (No. of Items)	Action and Responsibility
Professional	E-5 - 120	Written by E-9. Reviewed by W/E (or training specialist) and ISS (or E-9's supervisor).
	E-6/E-7 - 125	
	E-8/E-9 - 80	
Military Requirements	E-5 - 30	Written by MRN section, CGTRACEN Petaluma. Reviewed and approved by SMS's supervisor.
	E-6/E-7 - 25	
	E-8/E-9 - 70	

Servicewide Examination

Section Requirement

Items in each part of the examination should be arranged in specific topic areas called sections. Sections within each part must meet the following requirements:

- Have no fewer than 12 and no more than 40 items. The ideal section size is 20 plus or minus 2 items.
 - ⇒ A section with fewer than 12 items does not have enough data for computing useful statistics.
 - ⇒ A section with more than 40 items is likely to include more than one major topic area. The remaining sections in the examination part will be limited to very few topic areas.
- Must be homogeneous, i.e., all items in a section must refer to a common topic.

Procedure

The SWE is developed to sample the Enlisted Performance Qualifications. The procedure is listed below:

Step	Action	Responsibility
1	Validate database test items, quals/references.	E-9
2	Review clean run test item statistics of reference exam.	E-9
3	Prepare exam strategy worksheet.	E-9
4	Determine if test items to be retained, rejected, or revised. See test item bank development flowchart.	E-9
5	Prepare call-up sheet.	E-9
6	Print/format exam.	E-9
7	Spell-check and proofread the exam.	E-9

Servicewide Examination

Procedure (Continued)

Step	Action	Responsibility
8	Conduct first edit. Note: The ISS and W/E must approve all test items before they are used on a SWE.	W/E
9	Review and make appropriate changes.	E-9
10	Print camera-ready copy.	E-9
11	Conduct camera-ready edit.	W/E
12	If revision needed, go to step 9.	E-9
13	Complete section title sheet.	E-9
14	Prepare answer sheet.	E-9
15	Dual proof answer key with another SME or W/E.	E-9
16	Conduct final review and route to branch chief.	E-9
17	Send servicewide exam to PSC (adv).	E-9

Note: Depending on training source and staffing billets, responsibilities of the ISS and/or W/E could be performed by other staff.

Servicewide Examination

Deadline Dates Deadline dates for deliverable items required during the SWE cycles are listed in the following tables.

DEADLINE DATES FOR FALL SERVICEWIDE EXAMINATION

MONTH	REGULAR NOVEMBER SWE	RESERVE OCTOBER SWE
APR	15 APR - Letter from COMDT announcing SWE competition.	MID APR - ALDIST from COMDT announcing SWE competition.
MAY		15 MAY - All CRCs to PSC (adv).
JUN	15 JUN - All CRCs to PSC (adv). PSC (adv) start sending to printer. MID JUN - ALDIST from COMDT announcing SWE competition.	
JUL		1 JUL - All SWEs printed, page-checked, and packaged, ready for mailing.
SEP	1 SEP - All SWEs printed, page checked, and packaged, ready for mailing.	5 SEP - PSC (adv) begins mailing SWEs to unit Examination Boards.
OCT	5 OCT - PSC (adv) begins mailing SWEs to unit Examination Boards.	EARLY OCT - Reserve SWEs administered.
NOV	Early NOV - SWEs administered.	15-30 NOV - PSC (adv) mails Dirty Item Analysis to SME. Test item credits returned to PSC (adv).
DEC	15-30 DEC - PSC (adv) mails Dirty Item Analysis to SME. Test item credits returned to PSC (adv).	15 DEC - Advancement list mailed to SDL and profile letters mailed to candidates.
FEB	1 FEB - Advancement list mailed to SDL and profile letters mailed to candidates.	

Servicewide Examination

Deadline Dates (Continued)

DEADLINE DATES SPRING SERVICEWIDE EXAMINATION

MONTH	REGULAR MAY SWE
AUG	15 AUG - Letter from COMDT announcing SWE competition.
DEC	15 DEC - All MRN and E-8/E-9 problem solving CRC and all CRCs to PSC (adv). PSC (adv) start sending to printer. MID JAN - ALDIST from COMDT announcing SWE competition.
MAR	1 MAR - All SWEs printed, page-checked, and packaged, ready for mailing.
APR	5 APR - PSC (adv) begins mailing SWEs to unit Examination Boards.
MAY	Early MAY - SWEs administered.
JUN	15-30 JUN - PSC (adv) mails Dirty Item Analysis to SME. Test item credits returned to PSC (adv).
AUG	1 AUG - Advancement list mailed to SDL and profile letters mailed to candidates.

Servicewide Examination

Administration Schedules

The schedules for administering the SWE are outlined in the table below. The administration of the SWE is limited to 3 1/2 hours.

SWE Schedule by Rating		
Regular	E-5 through E-6	November
	E-5 through E-9	May
Reserve	E-5 through E-9	October

SWE Package

After the test development process is completed, mail the following completed items by Registered/Express mail to PSC (adv). Sample items required in the SWE package are included on the following pages.

- Properly formatted, camera-ready copy of the SWE. Format will depend on whether the test is unclassified or classified. See samples for variations.
 - The professional section of the SWE must end on an even-numbered page; therefore, the test may require a blank page.
 - SWE Section Title Sheet (CGI-2836).
 - SWE Answer Sheet (PPC-4801). The examination answer key is prepared on this form.
 - A transmittal memorandum that indicates the above underscored items as enclosures. (Sample copy is not included but should be available in the E-9's files.)
-

Packaging and Mailing Instructions

All testing material, whether sensitive or classified, shall be mailed/shipped double-wrapped with the inside envelope containing the following instructions on both sides in at least 1/2-inch letters:

SENSITIVE MATERIALS TO BE OPENED BY A TESTING MATERIAL OFFICER ONLY

The office and person designated to receive testing material shall be identified on the inner envelope only.

When sensitive testing material is mailed between the training source (TS) and CGI or PSC (adv), it must be accounted for by signature using registered mail or FedEx overnight delivery. Classified testing material **MUST** be mailed via registered mail. **DO NOT** use certified mail. A mail logbook shall be used to track testing material that is mailed.

Servicewide Examination

Sample SWE

Times Bold 12pt.	<p style="text-align: center;">FOR OFFICIAL USE ONLY U.S. COAST GUARD SERVICEWIDE EXAM</p> <p style="text-align: right;">MST3</p> <p>COMMUNICATIONS</p> <p>1. In the Northern Hemisphere, the semipermanent subtropical highs move southward during the ____ months.</p> <p style="margin-left: 20px;">A. winter B. autumn C. summer D. spring</p>	<p>5. To acknowledge the receipt of a message on a sound-powered telephone, you should say "____."</p> <p style="margin-left: 20px;">A. AFFIRMATIVE B. AYE, AYE C. ROGER D. ON THE LINES</p>
Double Space	<p>2. When you use the thermal wind between the 1,000- and 700-mb levels to indicate the speed of a surface low, the low's speed is approximately ____ of the thermal wind's speed.</p> <p style="margin-left: 20px;">A. 90% B. 75% C. 50% D. 30%</p>	<p>6. The Geostrophic Wind Method uses the surface and 700-mb levels to forecast the movement of ____.</p> <p style="margin-left: 20px;">A. isobars B. highs C. fronts D. isotherms</p>
Times 12 pt.	<p>3. To objectively predict the 24-hour movement and change in intensity of maritime low pressure systems, you should use height and temperature measurements from the ____ level.</p> <p style="margin-left: 20px;">A. 1,000-mb B. 850-mb C. 500-mb D. 350-mb</p>	<p>7. What is the most intensive and effective cooling process?</p> <p style="margin-left: 20px;">A. Frontal lifting B. Orographic lifting C. Horizontal divergence D. Vertical stretching</p>
Times Bold 12 pt.	<p>4. In the upper atmosphere over a developing low, the isopycnic level is generally considered to be at the ____ level.</p> <p style="margin-left: 20px;">A. 200-mb B. 350-mb C. 450-mb D. 600-mb</p>	<p>8. The most important factor in short-range terminal forecasting is the accuracy of ____.</p> <p style="margin-left: 20px;">A. area B. time C. distance D. direction</p> <p>9. In the Northern Hemisphere, the most extensive and dense cirrus clouds occur on the high pressure side or ____ of the jet stream axis.</p> <p style="margin-left: 20px;">A. west B. east C. south D. north</p>
Times Bold 12 pt.	<p>1</p>	<p>GO ON TO THE NEXT PAGE FOR OFFICIAL USE ONLY</p>

Servicewide Examination

Sample Confidential SWE

Times Bold 12 pt.

Times Bold 10 pt.

FT2

CONFIDENTIAL
U.S. COAST GUARD SERVICEWIDE EXAM

COMMUNICATIONS

1. (U) In the Northern Hemisphere, the semipermanent subtropical highs move southward during the ____ months.

- A. winter
- B. autumn
- C. summer
- D. spring

2. (U) When you use the thermal wind between the 1,000- and 700-mb levels to indicate the speed of a surface low, the low's speed is approximately ____ of the thermal wind's speed.

- A. 90%
- B. 75%
- C. 50%
- D. 30%

3. (U) To objectively predict the 24-hour movement and change in intensity of maritime low pressure systems, you should use height and temperature measurements from the ____ level.

- A. 1,000
- B. 850
- C. 500
- D. 350

4. (U) In the upper atmosphere over a developing low, the isopycnic level is generally considered to be at the ____ level.

- A. 200
- B. 350
- C. 450
- D. 600

5. (U) To acknowledge the receipt of a message on a sound-powered telephone, you should say "____."

- A. AFFIRMATIVE
- B. AYE, AYE
- C. ROGER
- D. ON THE LINES

6. (U) The Geostrophic Wind Method uses the surface and 700-mb levels to forecast the movement of ____.

- A. isobars
- B. highs
- C. fronts
- D. isotherms

7. (U) What is the most intensive and effective cooling process?

- A. Frontal lifting
- B. Orographic lifting
- C. Horizontal divergence
- D. Vertical stretching

8. (U) The most important factor in short-range terminal forecasting is the accuracy of ____.

- A. area
- B. time
- C. distance
- D. direction

9. (U) In the Northern Hemisphere, the most extensive and dense cirrus clouds occur on the high pressure side or ____ of the jet stream axis.

- A. west
- B. east
- C. south
- D. north

Double Space

Times Bold 10 pt.

Times Bold 12 pt.

Times Bold 10 pt.

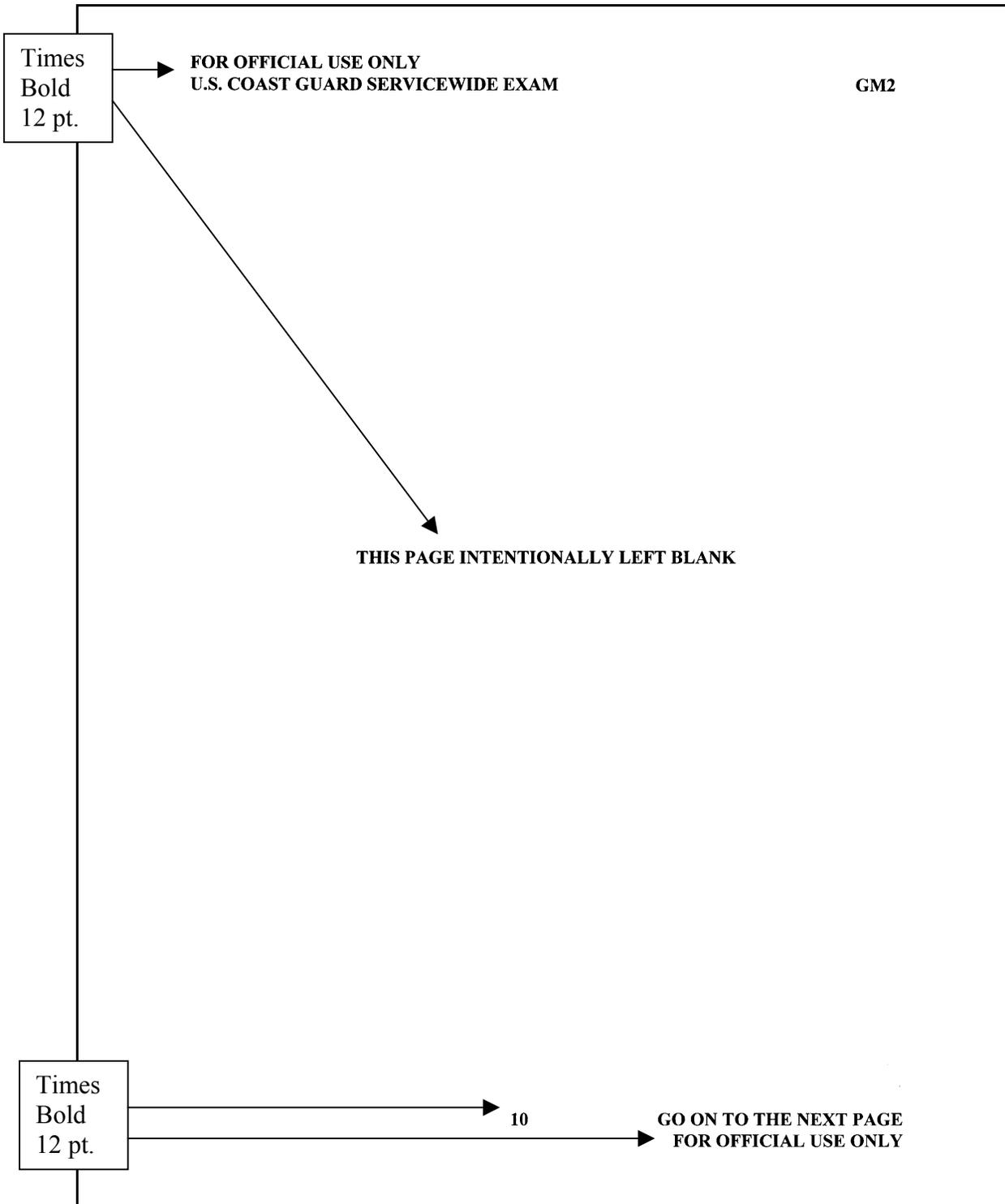
1

GO ON TO THE NEXT PAGE

CONFIDENTIAL

Servicewide Examination

Sample SWE Blank Page



Servicewide Examination

SWE Section Title Sheet

Each servicewide examination is divided into sections. Each section title should describe the topic of the section. The Section Title Sheet (CGI-2836) is used to record section titles, as shown below, and is prepared by the E-9 after completion of the dual-column examination. The E-9 will:

- Limit each section title to a maximum of 30 characters including spaces between words.
- Include Military Requirements line with appropriate number of questions per paygrade.
- Ensure that the "No. of Items" column sums to 150.
- Submit the completed Section Title Sheet with the camera-ready copy of the examination.

SWE SECTION TITLE WORKSHEET																																			
RATE: PS2																																			
SERIES: 17																																			
PAY GRADE: E-5																																			
																														FOR ADVANCEMENTS USE ONLY					
																														QUESTIONS PER SECTION	SYSTEM SECTION NUMBER	SECURITY CODE			
///	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					
01	F	A	C	I	L	I	T	Y	I	N	S	P	E	C	T	I	O	N															47		
02	V	E	S	S	E	L	M	O	V	E	M	E	N	T	S																	07			
03	V	E	S	S	E	L	B	O	A	R	D	I	N	G																		32			
04	E	N	V	I	R	O	N	M	E	N	T	A	L	R	E	S	P	O	N	S	E											34			
05	M	I	L	I	T	A	R	Y	R	E	Q	U	I	R	E	M	E	N	T	S												30			
06																																			
07																																			
08																																			
09																																			
10																																			
11																																			
12																																			
																												TOTAL:	150						

* PLEASE PRINT TITLES ONE LETTER PER BLOCK AND LEAVE A SPACE BETWEEN WORDS.

* PROFILE LETTERS CANNOT ACCEPT MORE THAN 30 CHARACTERS FOR A SECTION TITLE.
PLEASE ABBREVIATE, WHEN NECESSARY, TO ENSURE ONLY 30 CHARACTERS PER SECTION TITLE.

DOT-U S Coast Guard PPC 1400 3/1/96 (Replaces CGI 2836 11/76)	MSTCM Edward B. Rondomanski EXAM WRITER
	30-Mar-98 DATE

Servicewide Examination

SWE Answer Key

The subject matter expert prepares an answer key for the professional portions of each examination on the USCG Pay and Personnel Center Examination Answer Sheet (PPC-4801). The steps are listed below:

Due to a new computer upgrade at PSC, these requirements may have changed. The SSN block is not filled in and other changes may be forthcoming. Contact PSC (adv) for latest info.

- Use a #2 soft lead black pencil.
- Fill in name of person who prepared the key, the short title, and exam series number.
- Leave this area for the Social Security Number **blank**. PSC will enter appropriate data per their instruction beginning with 2004 SWE cycles.
- Complete the Exam Identification Number using the appropriate examination rate code and series number.

⇒ Examination rate codes are listed on the following page.

⇒ Exam series are numbered in a continuous series.

Below is an example of the USCG Pay and Personnel Center Examination Answer Sheet.

Leave Key Code BLANK.

DEPARTMENT OF TRANSPORTATION UNITED STATES COAST GUARD PPC-4801 01/94		USCG PAY AND PERSONNEL CENTER EXAMINATION ANSWER SHEET											
Name <u>Person Who Prepared Key</u> <small>(last) (initials)</small> Rate/Grade _____ Exam title <u>SHORT TITLE & SERIES</u> Exam Board <u>OPFAC</u> <small>Answer spaces are arranged in vertical sequence. Make only one mark to answer one question. To avoid erasures, at first mark your selection lightly or with a small dot. Then, after you are satisfied no changes will be made, darken circles carefully.</small>		SOCIAL SECURITY NUMBER (Blank)				EXAM IDENTIFICATION NO. 0 2 0 9 2 0				CODE ONLY WHEN DIRECTED			
EXAMPLE: 1 <input type="radio"/> (A) <input checked="" type="radio"/> (B) <input type="radio"/> (C) <input type="radio"/> (D) 3 <input type="radio"/> (A) <input type="radio"/> (B) <input checked="" type="radio"/> (C) <input type="radio"/> (D) 2 <input type="radio"/> (A) <input checked="" type="radio"/> (B) <input type="radio"/> (C) <input type="radio"/> (D) 4 <input type="radio"/> (A) <input type="radio"/> (B) <input type="radio"/> (C) <input checked="" type="radio"/> (D)		PRIVACY ACT OF 1974 A. AUTHORITY FOR USE AND WHETHER MANDATORY OR VOLUNTARY – 14 U.S.C. Sec 633. Voluntary. B. PRINCIPAL PURPOSE – Identify student record. Score test answers. C. ROUTINE USES – Establish score on exam. Enter score into final multiple for advancement. D. EFFECT ON YOU IF YOU DO NOT PROVIDE THE INFORMATION REQUESTED – Your answer sheet will not be scored. You will be dropped from advancement competition.											

Note: This form is acceptable for use although some blocks contain out-of-date information (e.g, Department of Homeland Security and USCG Pay and Personnel Center).

Servicewide Examination

SWE Rate Codes

The examination “rate code” is the first three digits of the exam identification number on the answer sheet. (Rate here refers to the rating specialty and paygrade level). Examination rate codes are listed below:

SERVICEWIDE EXAMINATION RATE CODES

Rate	Code	Rate	Code	Rate	Code	Rate	Code
AMT2	206	ET2	222	MK2	232	YN2	275
AMT1	106	ET1	122	MK1	132	YN1	175
AMTC	006	ETC	022	MKC	032	YNC	075
AMTCS	806	ETCS	822	MKCS	832	YNCS	875
AMTCM	906	ETCM	922	MKCM	932	YNCM	975
AET2	290	FS2	251	MST2	234		
AET1	190	FS1	151	MST1	134		
AETC	090	FSC	051	MSTC	034		
AETCS	890	FSCS	851	MSTCS	834		
AETCM	990	FSCM	951	MSTCM	934		
AST2	210	GM2	229	OS2	238		
AST1	110	GM1	129	OS1	138		
ASTC	010	GMC	029	OSC	038		
ASTCS	810	GMCS	829	OSCS	838		
ASTCM	910	GMCM	929	OSCM	938		
BM2	212	HS2	230	PS2	267		
BM1	112	HS1	130	PS1	167		
BMC	012	HSC	030	PSC	067		
BMCS	812	HSCS	830	PSCS	867		
BMCM	912	HSCM	930	PSCM	967		
DC2	215	IT2	280	PA2	236		
DC1	115	IT1	180	PA1	136		
DCC	015	ITC	080	PAC	036		
DCCS	815	ITCS	880	PACS	836		
DCCM	915	ITCM	980	PACM	936		
EM2	219	IV2	266	SK2	250		
EM1	119	IV1	166	SK1	150		
EMC	019	IVC	066	SKC	050		
EMCS	819	IVCS	866	SKCS	850		
EMCM	919	IVCM	966	SKCM	950		

Aviation Maintenance Technician (AMT)
 Avionics Electrical Technician (AET)
 Aviation Survival Technician (AST)
 Boatswain’s Mate (BM)
 Damage Controlman (DC)
 Electrician’s Mate (EM)
 Electronics Technician (ET)
 Food Service Specialist (FS)
 Gunner’s Mate (GM)
 Health Services Technician (HS)

Information Systems Technician (IT)
 Investigator (IV)
 Machinery Technician (MK)
 Marine Science Technician (MST)
 Operations Specialist (OS)
 Port Security Specialist (PS)
 Public Affairs Specialist (PA)
 Storekeeper (SK)
 Yeoman (YN)

Servicewide Examination

Patterns

Those using the Gemini test item database may not be able to comply with these rules regarding patterns to be avoided.

After the answer key is completed, check to ensure that the sequence of correct responses does not form a recognizable pattern on the examination answer sheet. The number of As, Bs, Cs, and Ds used as correct response choices should be nearly, but not exactly, equal throughout the examination. If ANY type of pattern is evident, a change MUST be made by rearranging the following:

- Items within sections
- Item responses

The sample answer key below shows common response patterns that must be avoided.

1 ●●●●	41 ●●●●	81 ●●●●	121 ●●●●
2 ●●●●	42 ●●●●	82 ●●●●	122 ●●●●
3 ●●●●	43 ●●●●	83 ●●●●	123 ●●●●
4 ●●●●	44 ●●●●	84 ●●●●	124 ●●●●
5 ●●●● 1 - 8	45 ●●●● 41 - 48	85 ●●●● Repeated	125 ●●●● Equal
6 ●●●● Repeated Sequence	46 ●●●● Pairs	86 ●●●● Triplets	126 ●●●● Distribu- tion
7 ●●●●	47 ●●●● Repeated In	87 ●●●●	127 ●●●●
8 ●●●●	48 ●●●● Sequence	88 ●●●●	128 ●●●●
9 ●●●●	49 ●●●●	89 ●●●●	129 ●●●●
10 ●●●●	50 ●●●●	90 ●●●●	130 ●●●●
11 ●●●●	51 ●●●●	91 ●●●●	131 ●●●●
12 ●●●●	52 ●●●●	92 ●●●●	132 ●●●●
13 ●●●● 9 - 16	53 ●●●● 49 - 56	93 ●●●●	133 ●●●●
14 ●●●● Reverse Repeated Sequence	54 ●●●● Random Repeated	94 ●●●●	134 ●●●●
15 ●●●●	55 ●●●● Pairs	95 ●●●●	135 ●●●●
16 ●●●●	56 ●●●●	96 ●●●●	136 ●●●●

Another rule to follow is that the answer key should contain no more than three same-letter responses in sequence.

Servicewide Examination

Challenge of SWE

After administration of the SWE, some examinees will write to PSC (adv) to challenge SWE items. For any challenge, the SWE item must be checked. Challenges are generally of two types:

- Content. Content challenges are usually received when the SWE answer sheets are returned to PSC (adv). Challenged items dealing with content will be credited during the "dirty run" stage at the discretion of the training source (TS).
- Computation. Computation (scoring) challenges are received after the SWEs have been scored and profile letters are sent to examinees. Any computation problems are corrected upon receipt of the challenges by PSC (adv).

Acknowledging Challenges

Although most correspondence challenging the content of SWE items will be received by PSC (adv), some challenges may be received directly by the TS. The subject matter specialist (E-9) at the TS will review challenges during the prescoring audit or "dirty run" stage. Crediting of exam items will be done at this stage as appropriate. The E-9 will acknowledge each challenge received. The acknowledgment reply should be similar to the Examination Question Inquiry on the following page.

Note: Coast Guard memorandums have replaced rapidraft letters per new Coast Guard Correspondence Manual, COMDTINST M5216.4 (series).

Servicewide Examination

Sample Examination Question Inquiry

Use Coast Guard memorandum instead of rapidraft letter.

DEPARTMENT OF TRANSPORTATION U. S. COAST GUARD CG-3883 (Rev. 4-83)	RAPIDRAFT LETTER	MAY BE TYPED OR HANDWRITTEN
INSTRUCTIONS		
ORIGINATOR - Use for routine correspondence not requiring action, review, or comment by officers in the chain of command.		
ADDRESSEE - Reply on here, returning original to originator. Keep file copy for your files.		
TO: <ul style="list-style-type: none"> ● COMMANDING OFFICER ● USCGC CHASE (WHEC 718) P.O. Box 3187, Terminal Island Station San Pedro, CA. 90731-0208 ● Attn: BSO ● 	STAFF SYMBOL/SSIC/PHONE t-zro 1418 PTS 827 2233	DATE 21 October 1992
<p>Subj: SWE INQUIRY</p> <p>REF: Your rpdrfiltr dtd 10 Sep 92</p> <ol style="list-style-type: none"> 1. Your correspondence, ref. (a), concerning the RD1 SWE concerning item 15 has been received. Each challenged item is checked for accuracy and currency. If there is any doubt that an exam question is valid, that question will be credited for all exam participants. 2. Your effort to ensure a fair and accurate exam is appreciated. To prevent exam compromise, we do not provide answers or references for exam participants. 3. If there is any other information we can provide, please feel free to contact the RD Subject Matter Specialist, RDCM Smith, at the address below. You may also contact RDCM Smith at () - . <p style="text-align: center;">A.B. SMITH, RDCM, USCG By Direction</p>		
FROM: <ul style="list-style-type: none"> ● Commanding Officer ● U.S. Coast Guard Reserve Training Center Yorktown, VA 23690-5000 ● 	DO NOT USE FOR CLASSIFIED CORRESPONDENCE PREVIOUS EDITION MAY BE USED BN7530-00-F01 -501 0	

Servicewide Examination

Prescoring Audit

The E-9 must audit the entire examination. Every item must be verified to be current and applicable based on the status of the item reference on examination day. Challenges from students must be considered during the audit of the examinations. This audit is conducted in two phases. Phase one is done prior to the receipt of the item analysis ("dirty run"). Phase two is performed after receipt of the "dirty run."

During phase one, the E-9 will:

- Review all items based on references that have been changed between the time the examination was prepared and the time it was administered.
- Complete as much item verification and research as possible prior to receipt of the "dirty run" because of the quick turnaround time required.
- Credit the score key for any item which was not correct on examination day.

Upon receipt of the "dirty run," the E-9 has 3 working days to audit the examination and express mail the results back to PSC (adv).

During phase two, the E-9 will:

- Review every item with double asterisks.
- Check score key and take the following action:

IF the ...	THEN ...
score key was miskeyed	correct the score.
score key is correct	check item wording.
item is unclear or irrelevant	credit the item.
item is clear and relevant	take no action.

Note: Following the Reserve CG examinations, the prescoring audit is conducted for only the PS and IV ratings.

Servicewide Examination

SWE Audit Results

The E-9 will use one of the following change forms received with the "dirty run" from PSC (adv) to record the SWE audit results. Samples of each change form are shown on the following pages.

- Credits and/or Score Key Changes Form. Indicate the items to be credited or that have score key changes. A separate form is required for each examination that has key changes or credits.
- No Credit/Score Key Change Form. Indicate no changes to answer key. The same form may be used for all examinations with no key changes.

Upon completion of the prescoring audit, the E-9 will submit to PSC (adv) the appropriate change form that denotes items which are to be credited and which have a score key correction. The examination name, item number, and action required must be entered. Change forms may be sent by regular mail, but must be double-wrapped and stamped with "SENSITIVE MATERIALS TO BE OPENED BY TESTING MATERIAL OFFICER ONLY."

A credited item will be marked with an asterisk on the PSC (adv) item analysis printout for the next examination series revision. All four responses of the item will be set apart by parentheses.

Note: This "dirty run" analysis is not to be used for exam revision. A new run will be provided before a new series revision.

Student Profile Form

To provide the candidate with servicewide examination results and the points used to compute the final multiple, PSC (adv) mails a student profile form to each candidate.

The candidate profile form includes:

- List of examination section titles.
 - Percent of correct answers per section.
 - Candidate's final multiple used to determine placement on the eligibility list.
 - Candidate's standing on the eligibility list.
 - Promotion cutoff on the eligibility list.
-

Servicewide Examination

Sample Credits/or Score Key Changes Form

Memorandum

U.S. Department of
Transportation
United States
Coast Guard



Subject: CREDIT/OR SCORE KEY CHANGES Date: _____
1418

From: _____ Reply to
attn. of:
(training source)

To: Commanding Officer, Pay and Personnel Center (ADV)

1. Change score key for the Regular/Reserve _____ servicewide examination
series _____. (exam rate)
(no.)

CHANGE SCORE KEY			
ITEM#	CREDIT	FROM	TO

(training source)

Note: "To: line" is now Commanding Officer, Personnel Service Center (adv).

Test Strategy and Statistics

Introduction

There is specific strategy to be used in the development of servicewide examinations based on the following conditions:

- Test items are updated to reflect current qualifications, verified for content and currency, and revised as needed.
 - Level of emphasis of rating qualifications has been determined by sections.
 - Test items for qualifications are classified by weight levels for each paygrade.
 - Statistics of previous examinations and individual test items are reviewed and analyzed.
-

Item Revision

The E-9 must check each item in the test item database prior to developing the examination to determine whether to retain, revise, or reject a test item. A retained item must meet the following qualifications:

- Fall within the strategy for the examination.
- Be related to a qualification, have a valid reference, and have acceptable parameter values.
- Conform to item writing principles.

If an item does not meet these qualifications, it should be revised. If an item does not meet these qualifications, even after revision, it should be rejected.

Item Revision Plan

An item revision plan provides a record of revision/deletion actions to be taken. The purpose of the plan is to:

- Identify items that need to be revised or deleted.
 - Determine appropriate action to be taken.
 - Provide specific reason or justification for item revision or deletion.
-

Test Strategy and Statistics

Level of Emphasis

The level of emphasis is a design tool to assist the E-9 in developing an examination. This procedure assists in determining the most important qualifications for each paygrade. The responsibility of determining the level of emphasis belongs to the subject matter specialists who review and revise the qualifications (at a rating qualification review). The specific rating senior person should be a member of the review panel.

When determining the level of emphasis, divide the specific rating qualifications into sections (e.g., administration, supply, maintenance, repair, etc.) by paygrade. Use common sections for all paygrades E-4 through E-9. This ensures consistency in the format of examinations between each paygrade.

Example: An E-7 will need more emphasis placed on administration and operations rather than on publications, security, safety, or maintenance. The breakdown by section is shown below. (See also Examination Strategy Worksheet, page 5-59.)

Section	Level of Emphasis	Number of Items
Administration	29%	36
Publications	10%	12
Security	10%	12
Safety	14%	18
Maintenance	14%	18
Operations	23%	29
		125

Test Strategy and Statistics

Weight Level

A weight level is assigned to each test item based on the description and decisions outlined in the following table.

Weight level	Description	Decisions
A	Must know to perform	<ul style="list-style-type: none"> • Minimum of one question per qualification • How many more questions depends on level of emphasis
B	Good to know but not required to be able to perform	<ul style="list-style-type: none"> • Depends on level of emphasis whether these questions are needed to reinforce knowledge of A-level questions
C (Lower Paygrade)	Nice to know but covered at lower paygrade	<ul style="list-style-type: none"> • Used at higher paygrades discriminator to identify who knows most about the rating, not the paygrade

The same test item may also be used at different paygrades; however, the weight level assigned to the test item will change.

Example #1:

At the E-4 paygrade, you may have a test item for "perform CPR" which is assigned a weight level of A. At the E-5 paygrade an individual may be a trainer or supervisor. That E-4 test item then becomes supporting knowledge for "describe CPR" which is assigned a weight level of B at the E-5 paygrade.

Example #2:

At the E-6 paygrade, you may have a test item for "analyze o-scope traces" which is assigned a weight level of A. At the E-5 paygrade, that same test item is assigned a weight level of B for "read o-scope traces."

Test Strategy and Statistics

Test Strategy

The E-9 uses the level of emphasis and the weight levels of test items to plan the test strategy. In the example illustrating the level of emphasis breakdown, the level of emphasis for the administration section is 29 percent (or 36 questions) for the E-7 examination. If the specific rating has 14 qualifications in the administration section, the E-9 must write at least one question per qualification with a weight level of A. To determine what test items to use for the remaining 22 test items, the E-9 should use historical trends, knowledge of the rating, and professional judgment as guides in answering the following questions:

- How many additional questions should be used at the A-level?
- Should B-level test items be used? If so, how many?
- Should C-level test items (those tested at lower grades) be used as discriminators? If so, how many?

In addition, the E-9 uses test and test item analysis statistics to plan the strategy for developing both SWE and EOCT.

Test and Item Statistics

Detailed statistical analysis of the SWE is provided by PSC (adv). Statistics are tools that help to ensure a quality examination. They provide very important feedback to persons in the examination development process. Statistics can be used to answer the following questions.

- Is the test item as difficult or easy as desired?
 - Do the items portray an accurate measure of an individual's knowledge and ability to perform a qualification?
 - Are there mistakes in the answer keys or in the items themselves?
-

Test Strategy and Statistics

Statistical Terms

Before using statistical reports to develop an examination, review the following terms. See sample item analysis printout and section analysis report for examples.

Reliability - the ability of the test to accurately identify the knowledge possessed by the candidates. A perfectly reliable test will produce exactly the same results (test score) if administered to the same candidates again and again. True reliability can be statistically estimated by a number ranging from .000 to +1.000. Reliability estimates close to .000 are bad; those close to +1.000 are good. The minimum acceptable reliability estimate for populations of 20 or more is .80. Replacing items that all or almost all candidates answer correctly and items that all or almost all candidates answer incorrectly can raise low reliability estimates.

Example of a good reliability estimate: REL .830

Variability - the ability of the test to spread candidates along the raw score range of (0-150) of the test. Low or no variability indicates a test incapable of distinguishing those candidates with the most knowledge from those with the least.

The variability of a test is estimated by the standard deviation. The ideal standard deviation is 15.00. The acceptable range of the standard deviation is 12.00 - 18.00. If the standard deviation is too low, too many candidates are getting scores too close to each other. To increase the standard deviation, revise or replace items to:

- Increase the range of item difficulty on the test.
- Spread the item difficulties (p-values) more evenly throughout the range.

Example of an acceptable standard deviation: STD DEV 12.64

Test Strategy and Statistics

Statistical Terms (Continued)

Difficulty - The difficulty of a test is indicated by the following two statistics:

- Average score (mean)
- Average p-value (average item difficulty)

The mean and the average p-value are mathematically identical, but expressed in different scales. The average p-value is the mean expressed as a proportion of the total number of items. The following examples are located on the Section Analysis Report.

Example of an average score: MEAN 90.64

Example of an average p-value: AVG P .605

Statistical Revision Guidelines

The guidelines for revising or replacing items on an examination are discussed below.

Population 20 and Greater. Revise or replace the following items:

- Those that are annotated with a double asterisk (**) on the item analysis printout.
- Those outside the desired examination average p-value range. These replaced items may be used later in another examination when a different average p-value range is desired.
- Credited items.

Population Less Than 20. Revise or replace items that have been CREDITED.

Note: Subject matter specialists should use historical trends, knowledge of the rating, and professional judgment as guides to determine if any other items should be revised or replaced.

Test Strategy and Statistics

Item Analysis Printout

The Item Analysis Printout shows how every item on a particular examination performed statistically. The statistics on each test item are used to determine whether a particular test item should be retained, revised, or rejected. P-values and d-values are listed for every item. These item statistics are discussed later in this section. The correct response for an item is indicated by parentheses. To the left of some items is the symbol **. The double asterisk (**) is a strong indication that something is wrong with an item, i.e., those who chose the correct response had the least amount of correct answers on the rest of that section. Parentheses around all responses for an item indicate that the item has been credited.

COAST GUARD SERVICEWIDE EXAMINATION ITEM LIST										CGI-4312	12-11-87	PAGE 321		
BMCM	SERIES	Q D	POP	ZI	MEAN	90.64	STD DEV	12.84	REL	.830	(\$ = P/F ITEM)			
ITEM CODE	P - A - D	P - B - D	P - C - D	P - D - D	ITEM CODE	P - A - D	P - B - D	P - C - D	P - D - D					
1101	.000 .000 (.387 -.177)	(.848 .206)	.064 -.073	126	(.677 .668)	.064 -.234	.064 -.364	.193 -.418						
**1102	.000 .000 (.709 .155)	(.161 -.398)	.129 .227	127	.096 -.279	.032 -.455	(.870 .488)	.000 .000						
1103	.225 -.447	.000 .000 (.741 .397)	.032 .075	128	.086 -.279	(.806 .538)	.032 -.455	.064 -.202						
1104	.000 .000 (.032 -.178)	(.903 .208)	.064 -.119	129	.032 .039	.064 -.364	(.774 .454)	.129 -.320						
1105	.032 .012	.000 .000 (.870 .175)	.096 -.206	130	(.806 .297)	.000 .000	.193 -.297	.000 .000						
1106	.258 -.294	.032 -.305	.000 .000 (.709 .402)	131	.032 -.095	.000 .000	.032 -.455	(.935 .396)						
1107	.418 -.102	(.483 .177)	.032 -.051	.064 -.119	** 132	(.967 -.174)	.000 .000	.000 .000	.032 .174					
1108	(.225 .429)	.000 .000 (.516 -.245)	.258 -.140	133	.129 -.391	(.774 .492)	.096 -.252	.000 .000						
1109	.032 -.114	(.418 .218)	.258 -.114	.290 -.080	134	.000 .000 (.806 .136)	.086 .016	.096 -.198						
1110	.000 .000 (.451 .400)	.000 .000 (.548 -.400)	135	.129 -.320	.032 -.050	.064 -.429	(.774 .530)							
1111	(.741 .200)	.032 -.319	.225 -.074	.000 .000	136	.032 -.140	.064 -.137	.161 -.251	(.741 .345)					
1112	.387 -.528	.032 -.002	(.548 .575)	.032 -.161	** 137	(.129 -.178)	(.258 -.564)	(.451 .514)	(.161 .137)					
1113	.000 .000 (.967 .161)	.032 -.161	.000 .000	138	.193 -.216	.032 -.455	(.677 .379)	.086 -.037						
1114	.032 -.240	.000 .000 (.987 .240)	.000 .000	** 139	(.709 .318)	(.064 -.299)	(.161 -.100)	(.064 -.137)						
1115	.064 -.231	.418 -.352	(.516 .462)	.000 .000	140	.290 .049	.258 -.345	(.290 .365)	.096 -.144					
1116	(.838 .196)	.032 -.161	.096 -.051	.032 -.161	** 141	(.193 -.438)	(.560 .301)	(.161 -.013)	(.064 .121)					
1117	.000 .000 .483 -.350	(.516 .350)	.000 .000	142	.322 .046	.193 -.377	.193 .004	(.290 .277)						
** 1118	(.774 .108)	.064 -.345	.161 .108	.000 .000	143	(.193 .346)	.354 -.173	.290 -.178	.161 .072					
1119	.064 -.117	(.387 .477)	.129 -.130	.418 -.324	144	.000 .000	.290 -.283	.677 .141	(.032 .354)					
1120	.161 -.158	.290 -.194	.225 .025	(.322 .290)	145	.225 .001	.193 -.398	(.354 .425)	.225 -.112					
1121	.064 -.060	.258 -.200	.225 -.242	(.451 .409)	146	.064 -.396	.064 -.299	(.870 .510)	.000 .000					
1122	.064 .053	.290 -.132	(.354 .487)	.290 -.410	147	.129 -.225	.225 -.587	(.645 .671)	.000 .000					
1123	.161 -.272	(.516 .406)	.096 -.194	.225 -.108	148	.064 -.008	.064 -.170	.225 -.492	(.645 .522)					
1124	.258 -.104	.129 -.214	.258 -.168	(.354 .399)	149	.096 -.306	(.677 .617)	.161 -.446	.064 -.137					
1125	.064 -.003	.161 -.158	.000 .000 (.774 .141)	150	(.516 .651)	.225 -.264	.225 -.549	.032 .084						

Test Strategy and Statistics

Section Analysis Report

The Section Analysis Report provides test analysis statistics to determine the difficulty of an examination. This report is beneficial when the SMS is revising an EOCT. Although the sample shown below is for the SWE, test analysis on the SWE is no longer required. A new SWE is used every exam cycle.

COAST GUARD SERVICEWIDE EXAMINATION SECTION ANALYSIS REPORT										CGI-4372 11-20-87 PAGE 106					
ERATE	SERIES	POPULATION		SKEWNESS		KURTOSIS		MEAN	STD DEV	REL	AVG P	EXAM D			
BACH	8	28		.072		2.292		92.21	12.12	.838	.598	.185			
PROFESSIONAL ITEMS: FIRST 80 QUESTIONS								46.36	7.67		.558	.217			
***** P-VALUE DISTRIBUTION *****										***** SECTION ANALYSIS *****					
SEC	.00-.19	.20-.42	.43-.61	.62-.81	.82-.70	.71-.88	.86-1.00	SEC	ITEMS	MEAN	STD DEV	ADJ REL	REL	AVG P	AVG D
1	2	5	2	2	3	8	8	1	30	19.93	3.43	.884	.604	.651	.279
2	1	2	1	2	3	10	1	2	20	12.92	3.10	.933	.652	.648	.346
3	1	7		3	1	2	1	3	15	6.98	1.73	.377	.036	.464	.355
4	2	6		2	2	3		4	15	6.92	2.21	.675	.411	.462	.316
5	3	5	2	1	2	10	7	5	30	19.00	2.94	.842	.516	.633	.215
6		4	2	3		3	3	6	15	9.17	2.35	.615	.518	.612	.333
7	1	4		1	2	10	7	7	25	17.67	3.69	.953	.774	.707	.343
TOTAL	10	33	7	14	13	46	27	TOTAL	150	92.21	12.12		.838	.598	.185
NORMAL	0	10	33	60	35	10	0								
***** INTERCORRELATION MATRIX *****															
SEC	1	2	3	4	5	6	7	8	9	10	11	12			
1	1.000	.558	.227	.127	.454	.257	.344								
2		1.000	.413	.236	.438	.523	.183								
3			1.000	.696	.341	.183	.176								
4				1.000	.376	.095	.198								
5					1.000	.331	.351								
6						1.000	.066								
7							1.000								

Test Strategy and Statistics

Interpreting Item Data and Parameters

The three critical measurements for interpreting item data and parameters are addressed below.

- P-value. P-value is the percentage of examinees who chose a particular response. The p-value of each distractor is calculated by dividing the number of examinees choosing that answer by the total number of examinees. The p-value of the correct answer is the item's p-value, or difficulty.

A good item will have a correct answer p-value between .25 and .90. Items with p-values very close to either 0.000 or 1.000 are poor items because:

- ⇒ Low p-value means the item is too difficult; few examinees chose the correct response.
- ⇒ High p-value means the item is too easy; many examinees chose the correct response.

Incorrect answer p-values that are 0.000 or very close to it indicate poor distractors that need revision or replacement.

- D-value. D-value is the discrimination index. The d-value measures the item's ability to identify those examinees with the most knowledge of the subject. It is a comparison of an item in relation to other items in the SAME section. The d-value for each response results from comparing the section average score for those examinees who chose each response against the average score of the section of all examinees.

The d-value range is from -1.000 to +1.000.

- ⇒ A good item will have a correct answer d-value between +.250 and +.750. The closer the correct answer d-value is to +1.000, the better the item is at identifying those examinees with more knowledge. The closer the correct answer d-value is to 0.000, the less power the item has to discriminate.
- ⇒ A good item will have an incorrect answer d-value between -.250 through -.750. An incorrect answer d-value that is positive indicates that those examinees with the most knowledge are choosing the incorrect answer to that item.

Test Strategy and Statistics

Interpreting Item Data and Parameters (Continued)

- Population. The population size determines the amount of data available for the computation of item parameter values.
 - ⇒ In higher population examinations (greater than 19 participants), all parameter values are highly significant.
 - ⇒ In low population examinations (less than 20 participants), there is too little data for meaningful parameter values. However, over several uses of an unchanged test item, the historical trend of responses can be determined by a cumulative method.

Cumulative Method Formula

The cumulative method formula for determining the historical trend of unchanged test item is shown below.

$$\text{Cumulative P-Value} = \frac{\text{Cumulative N-Value}}{\text{Cumulative Population}}$$

Example Computation:

ITEM STATISTICS				N-VALUES	
###	ITEM 015	P	A .200	D A -.###	.200 X 10 = 2
## ##			B .400	B -.###	.400 X 10 = 4
#	POP 10		C .300	C -.###	.300 X 10 = 3
###	04-10-92		D .100	D -.###	.100 X 10 = 1
###	ITEM 015	P	A .250	D A -.###	.250 X 8 = 2
## ##			B .500	B -.###	.500 X 8 = 4
#	POP 8		C .250	C -.###	.250 X 8 = 2
###	10-12-91		D .000	D -.###	.000 X 8 = 0
###	ITEM 015	P	A .250	D A -.###	.250 X 12 = 3
## ##			B .417	B -.###	.417 X 12 = 5
#	POP 12		C .167	C -.###	.167 X 12 = 2
###	04-15-91		D .167	D -.###	.167 X 12 = 2

Cumulative Population	Cumulative N-Value	Cumulative P-Value
10+8+12=30	A 2+2+3 = 7	7/30 = .233
	B 4+4+5 = 13	13/30 = .433
	C 3+2+2 = 7	7/30 = .233
	D 1+0+2 = 3	3/30 = .100

Test Strategy and Statistics

Desired Average P-Value Range

The following procedure and example are provided to assist the SMS in determining the desired average p-value range. Accuracy is best with populations of 20 or greater.

Step	Action						
1	Estimate the percent of candidates who, in your professional judgment, are at least minimally competent. Consult with program, force, and training managers to make an informed decision. <u>Note</u> : That percentage of candidates should score 70 percent correct or above on the examination.						
2	Find the average p-value range for the percent that you judge to be at least minimally competent using the chart on the following page.						
3	Find the average p-value of the previous examination, either: <ul style="list-style-type: none"> • from the Section Analysis, • by dividing the mean on the item analysis by the number of questions on the test. 						
4	Adjust the difficulty of the test so that the percent of minimally competent will score 70 percent correct or above.						
5	Revise items if the average p-value is outside the p-value range so that the average p-value of the test will be within the desired range <table border="1" data-bbox="704 1354 1336 1602" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th data-bbox="704 1354 1049 1486">IF the average p-value of the previous exam is . . .</th> <th data-bbox="1049 1354 1336 1486">THEN the exam items are . . .</th> </tr> </thead> <tbody> <tr> <td data-bbox="704 1486 1049 1545">below range</td> <td data-bbox="1049 1486 1336 1545">too difficult.</td> </tr> <tr> <td data-bbox="704 1545 1049 1602">above the range</td> <td data-bbox="1049 1545 1336 1602">too easy.</td> </tr> </tbody> </table>	IF the average p-value of the previous exam is . . .	THEN the exam items are . . .	below range	too difficult.	above the range	too easy.
IF the average p-value of the previous exam is . . .	THEN the exam items are . . .						
below range	too difficult.						
above the range	too easy.						

Test Strategy and Statistics

Desired Average P-Value Range (Continued)

Example

1. In rating (X), the SMS, after consulting with program, force, and training managers, judges that 85 percent of the candidates are at least minimally competent and that 15 percent are incompetent.
2. From the chart below, the average p-value range for 85 percent is .75-.80.
3. The average p-value on the source exam was .71, which is below the desired range, and means that the previous exam (without revision) would be too hard for 85 percent of the candidates to score 70 percent correct or above.
4. In this example, adjust the difficulty of the test by revising items with p-values less than .75 so that the average p-value of the new exam falls within the range, i.e., .75-.80.

DESIRED AVERAGE P-VALUE RANGES

Percent of Candidates Who Are At Least Minimally Competent	Desired Examination Average P-value Range*
0	.45-.59
5	.51-.60
10	.54-.62
15	.57-.63
20	.57-.65
25	.61-.66
30	.62-.67
35	.63-.67
40	.64-.69
45	.65-.70
50	.66-.71
55	.67-.72
60	.68-.73
65	.69-.74
70	.70-.75
75	.71-.77
80	.73-.78
85	.75-.80
90	.76-.83
95	.79-.87
100	.84-1.00

The term "average p-value range" refers to the overall examination, not individual item p-values.

Test Strategy and Statistics

Examination Strategy Worksheet

The Examination Strategy Worksheet, used primarily with SWEs, describes this basic plan, outlines section size and content guidelines, and records necessary changes to the examination. The basic format may be modified to meet your needs. The worksheet prepared for each examination develops the examination strategy as outlined below:

- Introduction. The following statistical data is entered in this section:
 - ⇒ Percent judged to be at least minimally competent
 - ⇒ Average p-value range
 - ⇒ Average p-value for previous examination
- Inputs to Revision. This section gives a general description of the examination revision planned by the SMS for this cycle. Important qualification, reference, job-emphasis, and statistical changes used as a basis for revision should be noted.
- Examination Section Outline. This outline should be designed so the examination will sample those performance-based qualification areas determined necessary for this cycle.
 - ⇒ Generally, the section titles and number of items per section will be obtained by modifying or duplicating the previous examination. However, major changes in the "qualifications" or the "job" could create the need for a major change in the examination section outline.
 - ⇒ In this outline, the E-9 determines the number of items in each section that can be retained from the previous examination. Comparison of this information with the total number of items needed for each section gives a good forecast of how many items need to be added, deleted, or revised.

After completion of the examination development process, the Examination Strategy Worksheet becomes the historical record of actions taken on the examination.

Test Strategy and Statistics

Sample Examination Strategy Worksheet

EXAMINATION STRATEGY WORKSHEET			
SERIES <u> 5 </u>	SMS _____		
RATE <u> BM </u>	REVIEWER _____		
Percent judged to be at least minimally competent: <u>85%</u>			
Average p-value range: <u>.75-.80</u>			
Average p-value for previous exam: <u>.71</u>			
INPUT TO REVISION:			
A. QUAL (TPOs): Maintenance qualifications lowered in pay grade.			
B. REFERENCES: Check revision of the Coast Guard Safety and Occupational Health Manual (COMDTINST M5100.29).			
C. STATISTICS: Six items need to be revised. Five items have p-values below desired average p-value range. One item was coded with a double asterisk on the item analysis printout.			
D. OTHER: More emphasis needed on administration and less on maintenance due to lowering of maintenance performance qualifications.			
EXAM SECTION OUTLINE:			
Section	Title	Level of Emphasis	# of Items
1	Administration	30%	36
2	Publications	10%	12
3	Security	10%	12
4	Safety	15%	18
5	Maintenance	15%	18
6	Operations	20%	24
Totals		100%	120

Test Strategy and Statistics

Summary of Examination Revision

When the Examination Strategy Worksheet has been completed, the E-9 begins actual examination development by revising or replacing items identified as faulty for either statistical or content reasons and by writing new items as required to fill out the Examination Section Outline.

When all retained, revised, and new items have been identified, prepared, and approved, the E-9 prepares the new exam in double-column format. The exam is then proofread by the W/E for grammatical accuracy, cueing, question sequencing, answer patterns, item repetition or similarity, and appropriateness to sections. Finally, the E-9 corrects the edited copy and prints the camera-ready copy.

When the camera-ready copy has been prepared, the W/E conducts the final proof. The E-9 completes the Section Title Sheet (CGI-2836) and prepares the answer key.

The camera-ready copy of the examination, the Section Title Sheet, and the answer key are then sent Registered/Express mail to PSC (adv). (One cover transmittal memorandum is also included with servicewide exams.) The Examination Strategy Worksheet is retained at the training source.

Note: Depending on the training source and staffing billets, the responsibilities of the ISS and/or W/E could be performed by other staff.

Appendix D

PAMPHLET FORMAT AND DEVELOPMENT

Pamphlet Format Section

Introduction This section establishes Coast Guard correspondence course standard pamphlet format. The purpose of an established format is to standardize the product and to ease the preparation procedures. A second section beginning on page D-22 includes information how to write text, use illustrations, edit text, and submit camera-ready copy.

Overview The following table is an overview of pamphlet format.

Pamphlet Format Overview		
Component	Characteristics	See Page No.
Text	12 Point Times New Roman.	D-12 D-13
Labels	Arial Bold 12 pt.	D-12 D-13
Titles	Arial Bold 14 pt.	D-12 D-13
Page Numbers	9 Point Times New Roman.	D-12
Cover/ Pamphlet No.	No page number. (Obtain pamphlet numbers from CGI.)	D-4
Title Page	Page number i.	D-5
Acknowledgments/ Reference Page	Back of title page. Page number iii. If reference list is long, it becomes an appendix.	D-7
Notice to Students	Page number ii.	D-8
Table of Contents	Always page v.	D-10
Lesson	Always begins on right-hand page. Numbered 1-1, 1-2, etc.	D-12
Lesson Title	Centered at top of page.	D-12
Figures	Label identifies figures.	

Pamphlet Format

Overview (Continued)

Pamphlet Format Overview (Continued)		
Component	Characteristics	See Page No.
Table	Label identifies table.	
Self-Quiz	May use a variety of test item formats.	D-16
Answers to Self-Quiz	Follows the self-quiz. Add a blank page if necessary so that the student cannot see the answers while completing the test.	D-17
Appendixes	Number pages A-1, A-2, etc. B-1, B-2, etc.	A-1
Pamphlet Review Quiz	Must be multiple-choice, four-response format. Add as an appendix (usually Appendix A).	D-18
Pamphlet Review Quiz Answer Key	Add as an appendix (usually Appendix B).	D-19
Glossary	May add as an appendix.	D-20
Request for Feedback	Add at the end of your pamphlet.	D-21

Pamphlet Templates

Training Center Yorktown has templates available to help you in formatting your course materials. The templates include all of the formatting elements described in this section. The templates, as well as instructions for using them, are located in Microsoft Word. Go from “Start” to “New Office Document” to the tab entitled “More,” then click on the folder “Pamphlet Templates.” Ask your training specialist for help when using these templates for the first time. You will find these templates to be extremely efficient in assembling your lessons and quizzes. Print the latest instructions for the pamphlet templates (and curriculum outline templates) and keep them as handy references. If you are assigned to another training center, then contact the following email address to obtain the boilerplates: pvalek@tcyorktown.uscg.mil.

Pamphlet Format

Format

The format is defined as the make-up or arrangement of a publication and includes the following:

- Page layout
 - Heading subordination
 - Page numbering
 - Required pages (Table of Contents, Notice to Student, etc.)
 - Text components (objectives, self-quizzes)
-

Pamphlet Organization

All correspondence course pamphlets must be organized in the following manner:

- Cover. The standard cover format, shown on page D-4, is mandatory. You need to provide:
 - ⇒ Pamphlet title
 - ⇒ Pamphlet number (SMS requests pamphlet numbers from CGI.)
 - ⇒ Date produced or revised
 - Title Page. The title page, shown on page D-5, must contain the following information:
 - ⇒ Pamphlet title
 - ⇒ Creation date of the pamphlet
 - ⇒ Revision date, if applicable
 - ⇒ Training source address/responsible (originating) office
 - ⇒ Training source telephone number
 - ⇒ Standard statement of responsibility
-

Pamphlet Format

Sample Cover Page

Changed to U.S. Department of Homeland Security (1 Mar 03)

U.S. Department
of Transportation
**United States
Coast Guard**



MANEUVERING BOARDS

Arial
Bold
All Caps
24 pt.

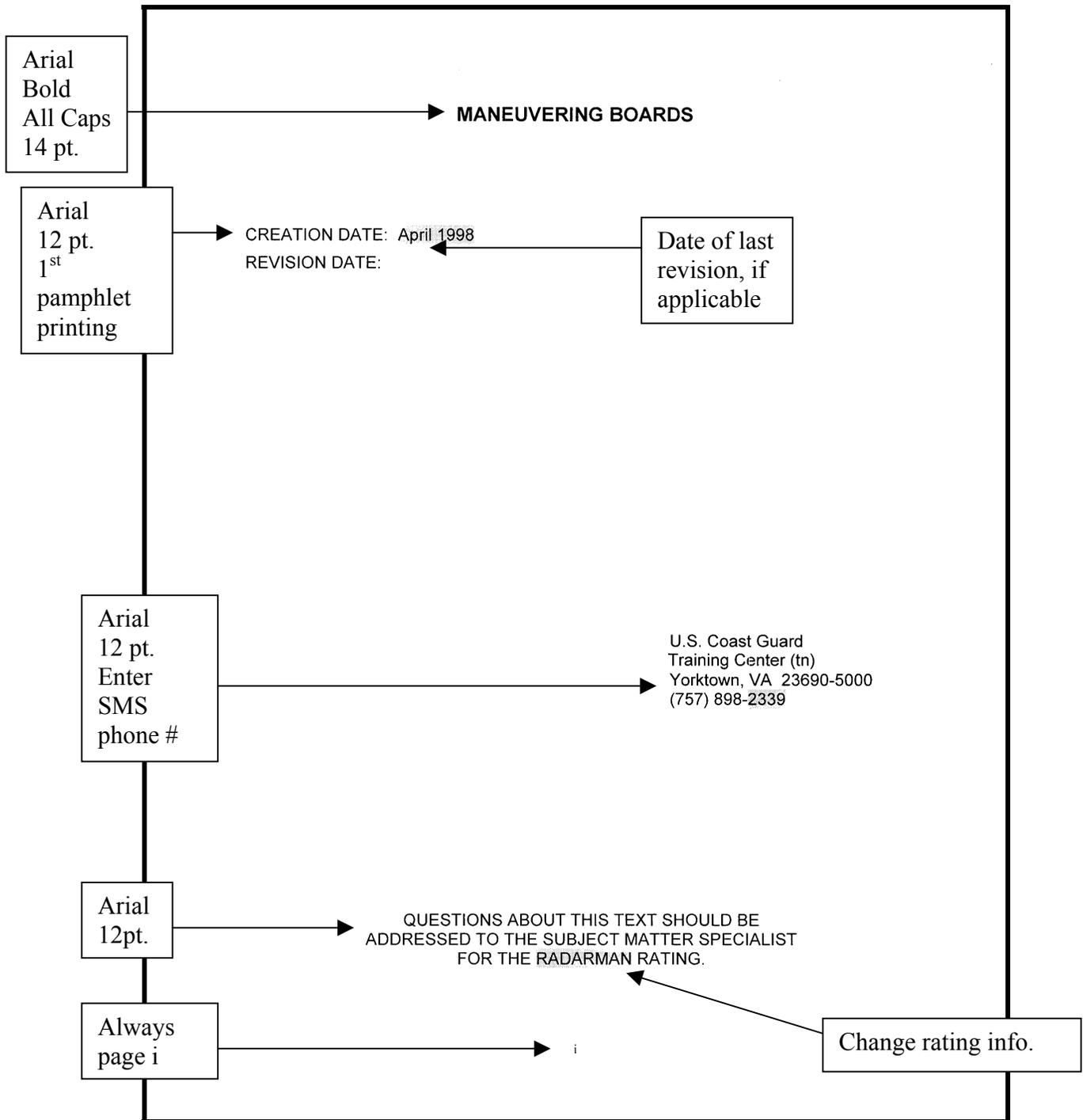
Arial
Bold
14 pt.

U.S. Coast Guard
Pamphlet No. W65102
(04/01)



Pamphlet Format

Sample Title Page



Pamphlet Format

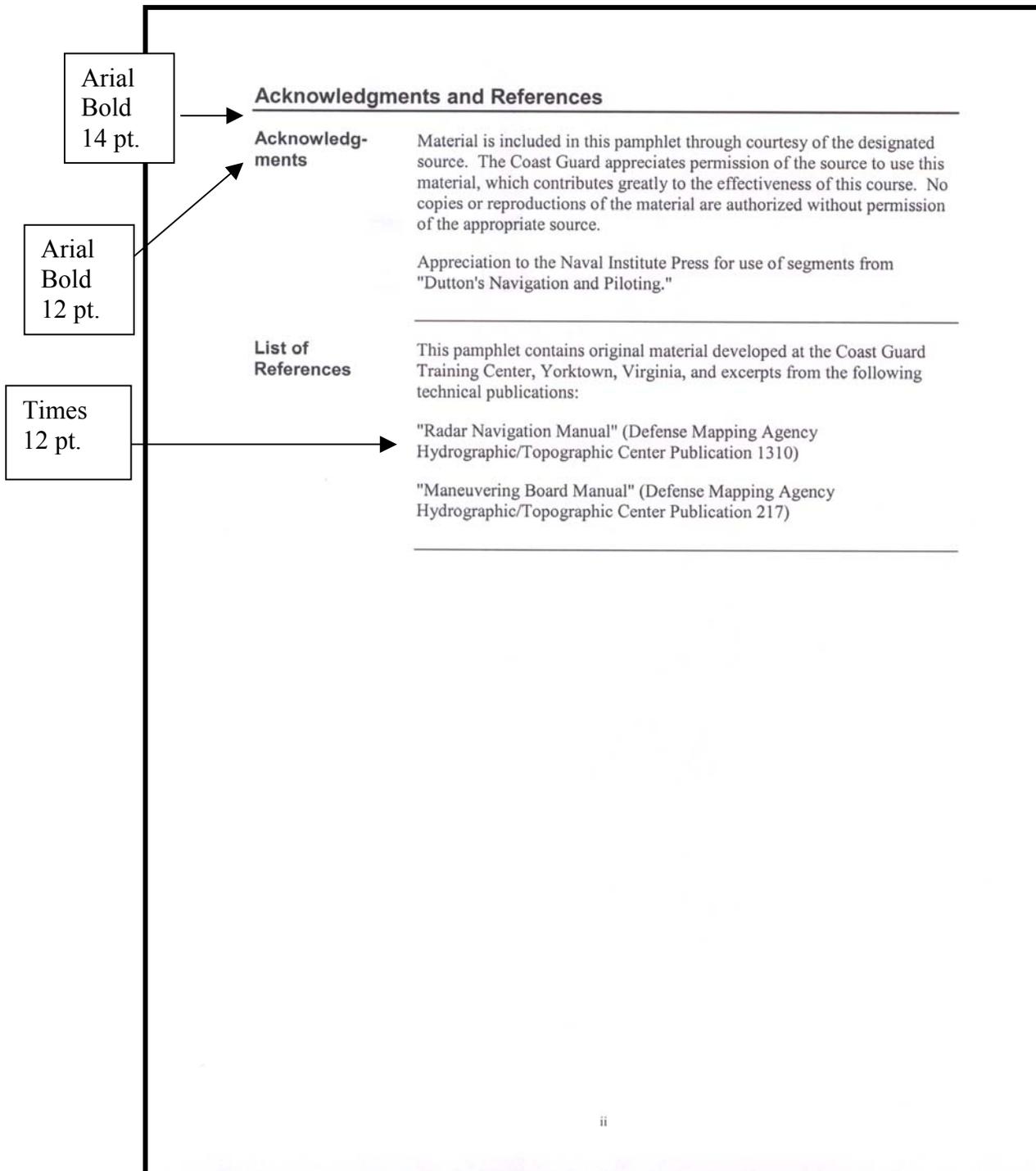
Pamphlet Organization (Continued)

- Acknowledgments. When used, the acknowledgment page ii, shown on page D-7, will always be on the back of the title page. Before you can use copyrighted material, you must obtain written permission from the copyright owner. A copy of this permission must be on file in the course originator's file. When this information is printed, credit **MUST** be given to the source. The acknowledgment page follows the sample or the statement furnished by the publisher or author. Procedures for obtaining a copyright release are discussed in the section "Writing the Text" in this manual.
- References. If the reference list is short, it may be included on the acknowledgment page shown on page D-7. Otherwise, it should be on a separate page as an appendix. It should contain both materials from which excerpted material has been taken and materials which were used for research.
- Notice to Student. The Notice to Student, shown on pages D-8 and D-9, should **ALWAYS** begin on page iii.
 - ⇒ The **FIRST** paragraph may be taken from the mission and scope of the curriculum outline. It should be a concise description of the contents of the pamphlet and should provide the student with any information that will be helpful in completing the course.
 - ⇒ The **SECOND** paragraph is the Important Note. This paragraph must be **EXACTLY** as stated in the sample.
 - ⇒ The next paragraphs may describe the course or pamphlet construction or content. Any specific suggestions about studying the course/pamphlet can be included here.
 - ⇒ The last paragraphs are the Performance Objectives, Quizzes, and SWE Study Suggestions. These paragraphs must be **EXACTLY** as stated in the sample. In addition, if your course has a lot of acronyms, add a glossary and add the following paragraph:

"Throughout this course, you will see acronyms along with their meanings. Many of these acronyms will be used on your end-of-course test; therefore, a glossary of acronyms to be used as a study guide has been included at the end of this pamphlet."
- Table of Contents. The table of contents, shown on page D-10, is always page v. If necessary, it may be continued on the reverse (page vi).

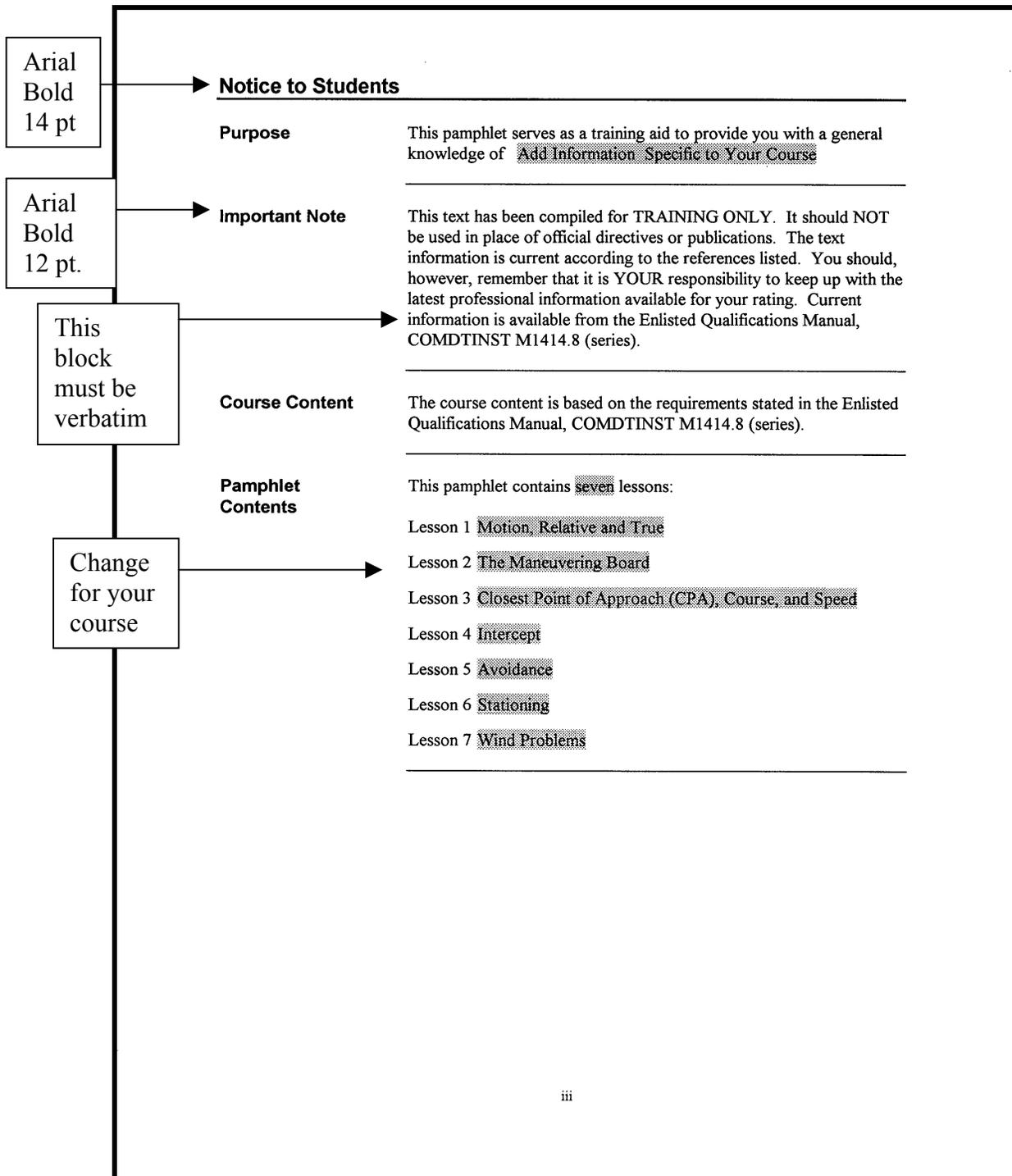
Pamphlet Format

Sample Acknowledgment/Reference Page



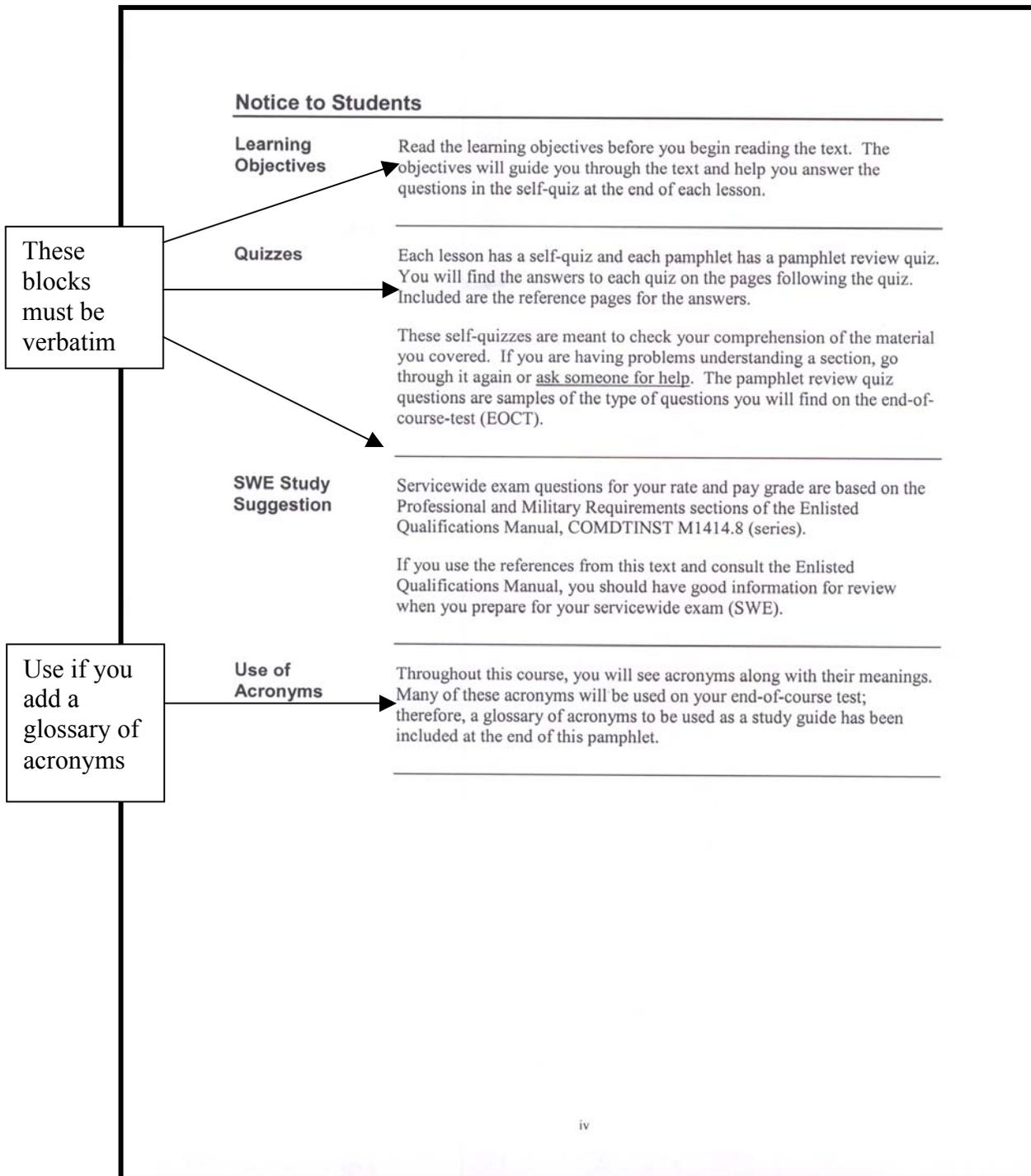
Pamphlet Format

Sample Notice to Student Page



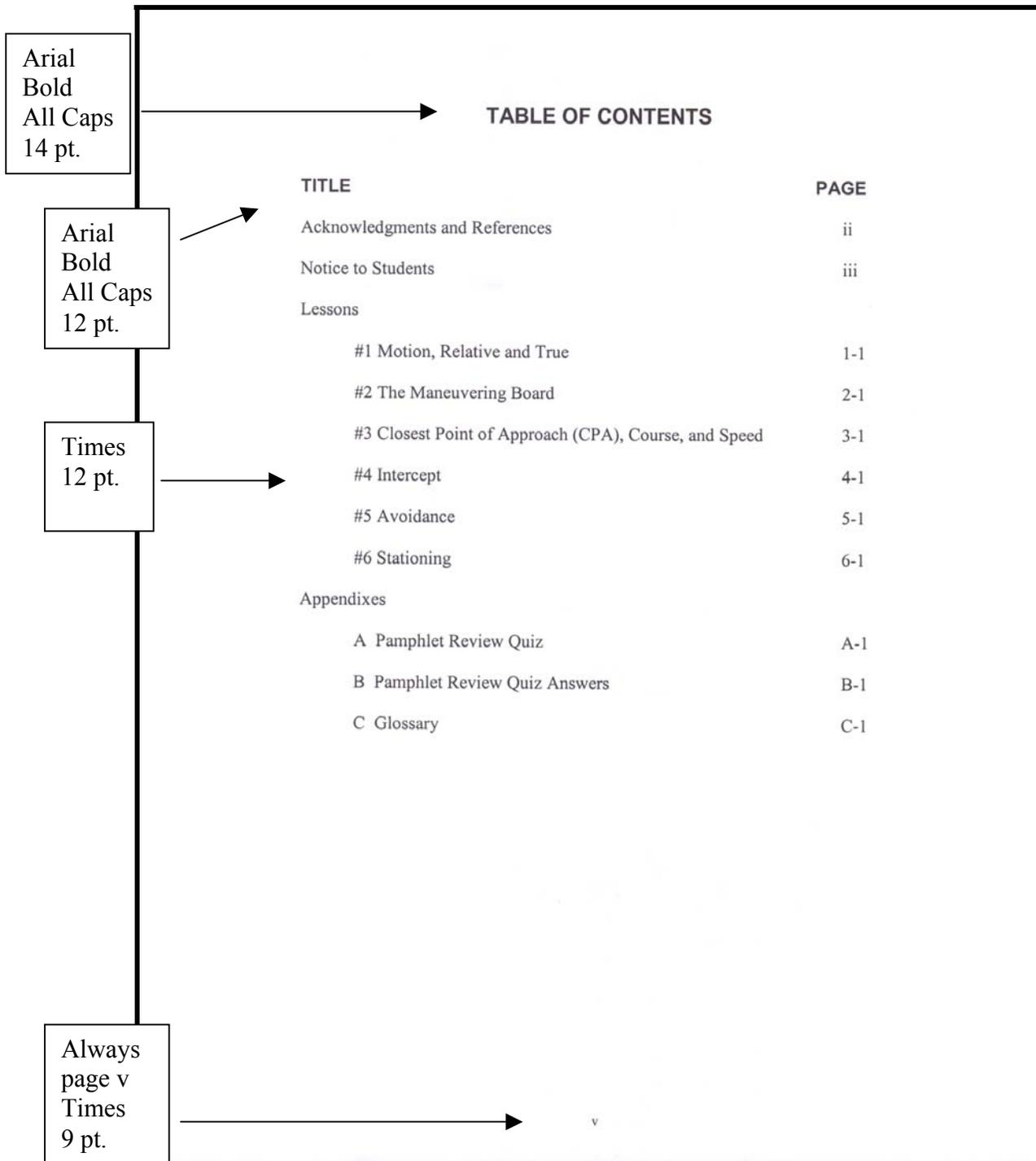
Pamphlet Format

Sample Notice to Student Page (Continued)



Pamphlet Format

Sample Table of Contents Page

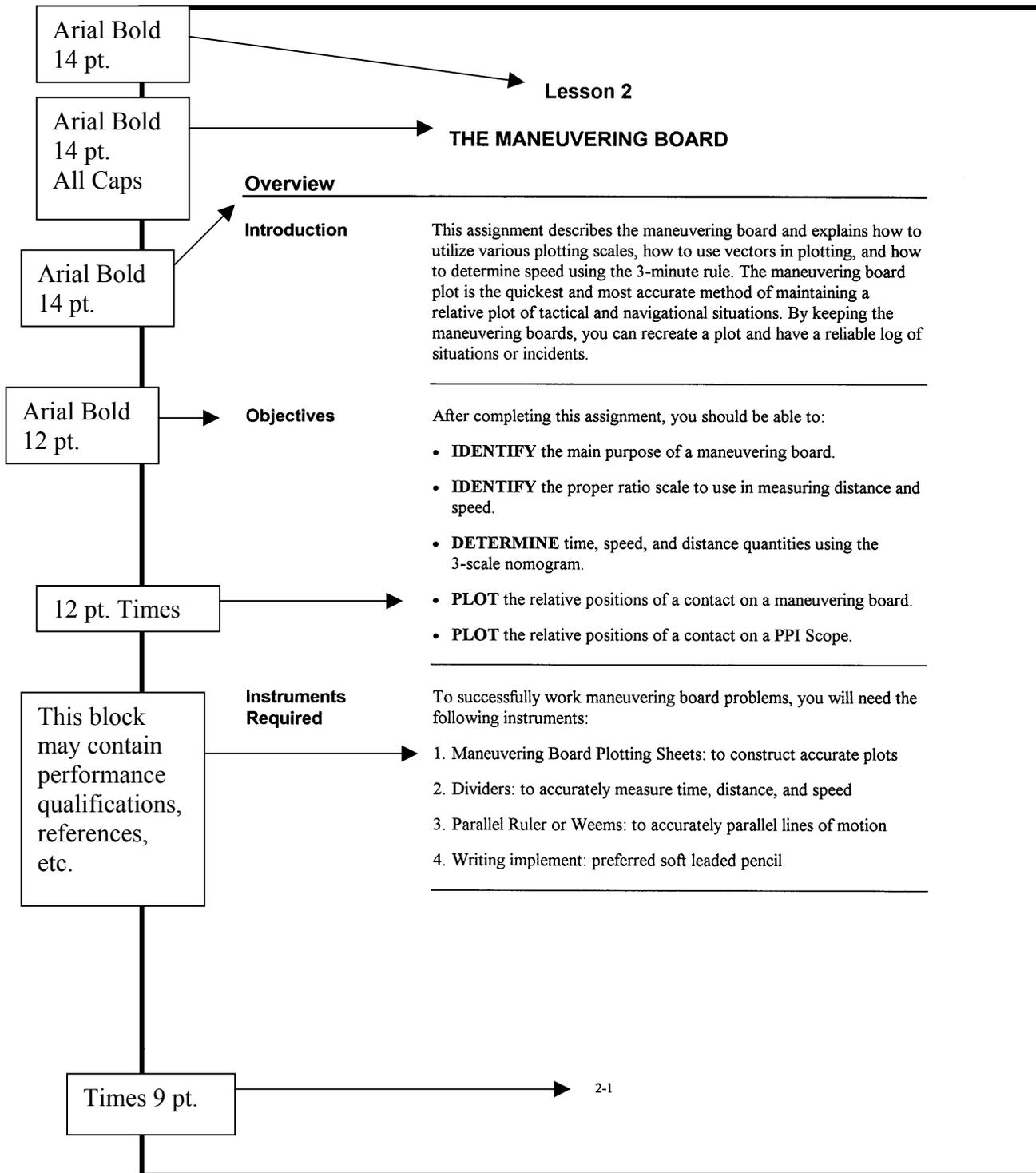


Pamphlet Format

Text Breakdown	<p>Courses are broken down into pamphlets; pamphlets into either units or lessons; units into lessons; and lessons into boldface divisions. These lesson headings and subheadings are standardized by the templates to achieve a professional appearance.</p> <p><u>Note:</u> Beginning in 2003, Performance Qualification Guides (PQGs) are being developed as accompanying pamphlets to nonresident correspondence courses. The PQG serves as a performance-based, systematic approach to direct the student in completing tasks directly related to their enlisted performance qualifications. A professional development supervisor (PDS) is appointed to mentor/train the student as he/she successfully demonstrates the tasks identified in the PQG.</p>
Text Format	<p>When developing your course, you should use the presentation that best helps you teach the text. You may use any one of the following formats:</p> <ul style="list-style-type: none"> • Structured writing format. (Samples on pages D-12 and D-13.) A Structured Writing Practice Guide is available at Training Center Yorktown or Training Center Petaluma. Also available is a structured writing template (SWT) that is a tool containing the formatting keystrokes and buttons to ensure uniform style of course material. For more information, read the Job Aid for Structured Writing Template (SWT). • Workbooks or study guides presented in the structured writing format. • Optional formats such as audio-visual slide tape programs and computer-assisted instruction. <p>In special cases, a text other than one developed at the training source may be selected as appropriate for nonresident training. If you use a commercial textbook, you must develop a workbook or study guide to accompany the text. The workbook/study guide should be organized by reading lessons. If the text does not contain adequate objectives and self-quiz items, you must supply them in the workbook. You also must write clear directions in any study guide which accompanies the commercial textbook.</p>
Lesson Title	<p>The lesson title is centered at the top of the page in the structured writing format.</p>
Lesson Number	<p>In the structured writing format, lesson numbering is optional.</p>

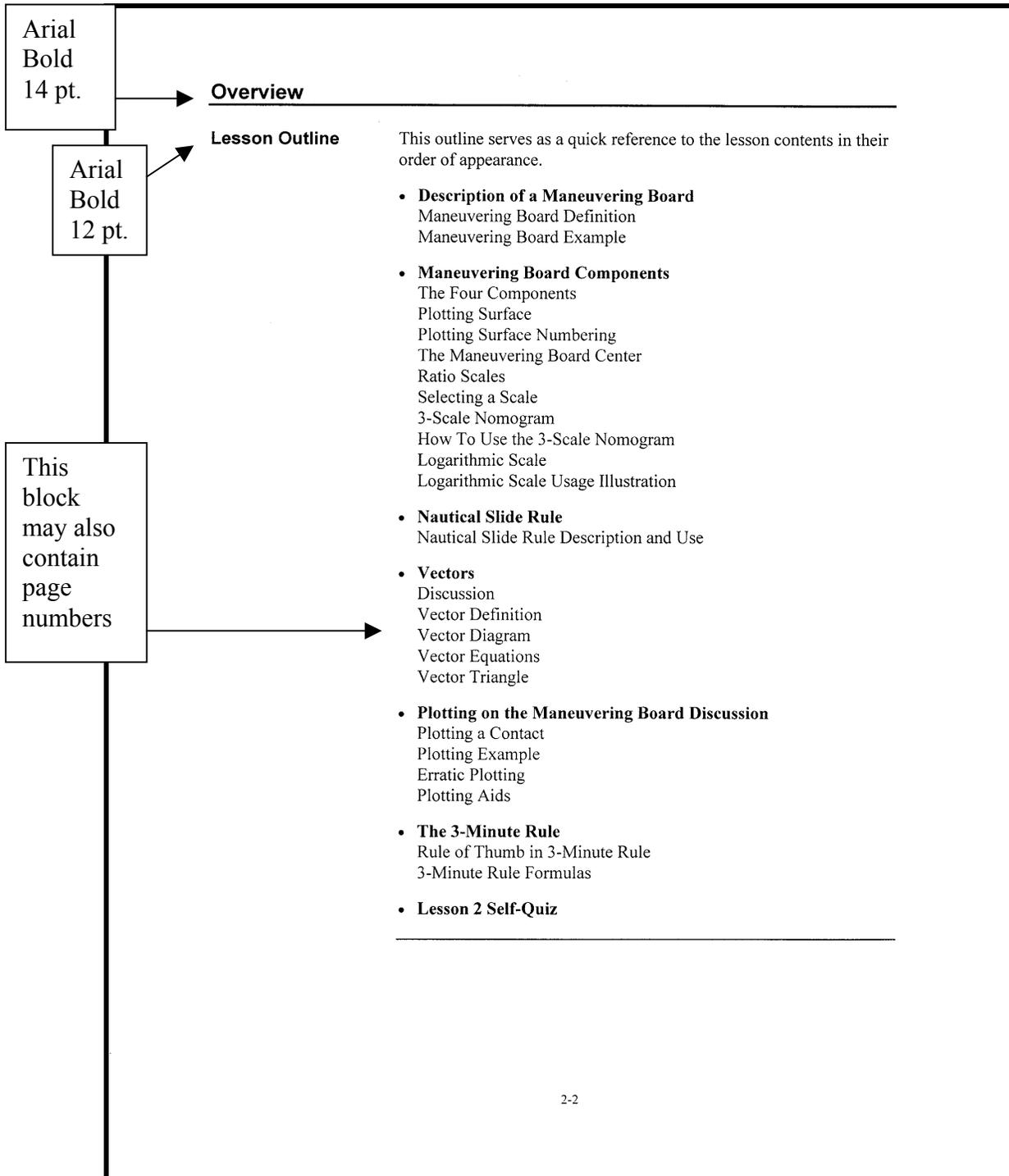
Pamphlet Format

Sample Structured writing Format



Pamphlet Format

Sample Structured writing Format Continued)



Pamphlet Format

Objectives	List the performance objectives as shown in the sample formats.
Figures	When using the structured writing format, use block labels to identify figures. As an exception, you may identify with a description below the illustration such as: Figure 1-1. A window installed with metal casing. (Suggested style is 10 pt./bold figure and its number/period/two spaces/uppercase first letter and lowercase remaining title or description/period.)
Tables	When using the structured writing format, use block labels to identify tables. Note: When preparing figures and tables for inclusion in a pamphlet, refer to the guidelines in the "Illustrations" section of this manual.
Page Numbers	The first page of each lesson must always begin on the right-hand page. The pages within the lessons will be numbered 1-1, 1-2, 1-3, etc.
Self-Quiz	A self-quiz, shown on page D-16, is required after every reading lesson. <u>Note:</u> Self-quizzes may also be called topic reviews or practical exercises.
Answers to Self-Quiz	For every self-quiz, you must include answers with page references to aid the student in locating the material in the text. The "answers to self-quiz" page, shown on page D-17, follows the self-quiz. If necessary, add a blank page after the self-quiz so the student cannot see the answers while completing the test. Refer to the "Self-Quiz" section in this manual for more detailed instructions.
Pamphlet Review Quiz	The pamphlet review quiz, shown on page D-18, is a required component designed to sample lesson objectives and to serve as practice for the end-of-course test. Label the pamphlet review quiz as Appendix A. Number the pages according to its appendix alphabetic designation. For example, Appendix A is numbered A-1, A-2, and so forth.
Pamphlet Review Quiz Answer Key	The pamphlet review quiz answer key with the page references, shown on page D-19, should be Appendix B immediately following the pamphlet review quiz.

Pamphlet Format

Glossary

If you choose to add a glossary, shown on page D-20, include it as Appendix C. Also, when you add a glossary of acronyms, add a paragraph to the Notice to Students as follows:

"Throughout this course, you will see acronyms along with their meanings. Many of these acronyms will be used on your end-of-course test; therefore, a glossary of acronyms to be used as a study guide has been included at the end of this pamphlet."

Request for Feedback

A request for feedback, shown on page D-21, should be included at the end of each pamphlet in the course. These suggestions and comments will help you when revising your course.

Pamphlet Format

Sample Self-Quiz

Arial
Bold
14 pt.

Lesson 1 Self-Quiz

Questions

Arial
Bold
12 pt.

1. List the three purposes for organizing a paint job.

1) _____

2) _____

3) _____

Times 12 pt

2. Recording the progress of a paint job is the responsibility of the ____.

A. first lieutenant
B. paint locker foreman
C. supervisor
D. deck worker

Times 12 pt

3. Match the paint in column A with its characteristics in column B. A paint may have more than one characteristic.

Column A	Column B
____ 1. Mare Island Epoxy	a. Fire retardant paint used on interior bulkheads overheads, and on machinery.
____ 2. Chlorinated Alkyd Resin	b. Paint containing a two-part kit. The two parts are mixed 1:1.
____ 3. Interior Gloss Alkyd	c. Paint is especially desirable on surfaces exposed to frequent scrubbing.
____ 4. Silicone Alkyd Enamel	d. Used on underwater bodies constructed of steel, wood, and fiberglass.
	e. Highly weather resistant.

2-9

Pamphlet Format

Sample Answers to Self-Quiz

Arial Bold 14 pt	→	Answers to Self-Quiz		
Arial Bold 12 pt	→	Question	Answer	Reference
		1	1) Promotes safety 2) Saves time and material 3) Workers know what is expected	1-1
		2	C	1-2
Times 12 pt.	→	3	1. b 2. a 3. c 4. e	1-3

2-11

Pamphlet Format

Sample Pamphlet Review Quiz

Arial
Bold
14 pt

Appendix A

PAMPHLET REVIEW QUIZ

Arial
Bold
12 pt

1. Movement can be measured in terms of ____.

- A. direction and distance
- B. distance and speed
- C. direction and speed
- D. speed and time

2. The movement that takes place when an object changes positions in relation to a fixed reference point is known as ____ movement.

- A. ground
- B. relative
- C. directional
- D. true or actual

3. The movement that takes place between two ships when one or both are moving is known as ____ movement.

- A. relative
- B. directional
- C. geographical
- D. true or actual

4. Which of the following is an example of relative motion?

- A. A train traveling from Key West, FL to Bangor, ME
- B. A speeding automobile passing a motorcycle
- C. A ship sailing around the world
- D. A person walking 5 miles

5. What is an imaginary line of direction across the water or land to an object such as a ship?

- A. Line of position
- B. Line of sight
- C. Bearing
- D. Angle

6. Relative bearings are measured clockwise from ____.

- A. ship's true direction
- B. ship's head
- C. imaginary north
- D. true north

7. What is the relative bearing of a contact that is broad on the starboard quarter of own ship?

- A. 225°R
- B. 190°R
- C. 135°R
- D. 090°R

8. Own ship's heading is 260°T. Your radar picks up a contact bearing 100°T. What is the relative bearing of the contact?

- A. 360°R
- B. 240°R
- C. 200°R
- D. 185°R

A-1

Pamphlet Format

Sample Pamphlet Review Quiz Answer Key

Arial
Bold
14 pt

▶ **Appendix B**

Arial
Bold
12 pt

▶ **PAMPHLET REVIEW QUIZ - ANSWER KEY**

	QUESTION	ANSWER	REFERENCE	QUESTION	ANSWER	REFERENCE
	1	D	1-3	20	A	2-8
	2	D	1-4	21	C	2-8
	2	B	1-4	22	C	2-8
	4	B	1-4	23	C	2-12
	5	C	1-8	24	B	2-14
	6	B	1-8	25	D	2-14
	7	C	1-10	26	C	2-15
	8	C	1-11	27	A	3-3
	9	D	1-11	28	C	3-5
	10	A	1-13	29	A	3-8
	11	D	1-13	30	C	3-14
	12	A	1-14	31	C	4-3
	13	A	1-15	32	B	4-3
	14	D	1-16	33	C	4-3
	15	C	1-16	34	C	4-7
	16	A	1-16	35	A	4-12
	17	B	2-3	36	A	4-17
	18	D	2-7	37	D	5-3
	19	B	2-7	38	A	5-3

B-1

Pamphlet Format

Sample Glossary

Arial Bold 14 pt.		
	➔	Appendix C
Arial Bold All Caps 14 pt.	➔	GLOSSARY
	<p>Aerodynamics</p> <p>Aeromagnetic</p> <p>Balanced</p> <p>Bass</p> <p>Common pool</p> <p>Decoding</p> <p>Electrical field intensity</p> <p>Electric tachometer</p> <p>Functional intensity</p> <p>Gyro</p> <p>Half tap</p> <p>Half wave</p> <p>Half-wave rectifier</p>	<p>The science of the motion of air and other gases.</p> <p>Pertaining to the magnetic field of the Earth as surveyed from the air.</p> <p>Electrically alike and symmetrical with respect to the ground.</p> <p>Sounds in the low audio-frequency range.</p> <p>A dedicated area of memory used as storage and shared by various processes.</p> <p>The process of obtaining intelligence from a signal code.</p> <p>A measure of the force exerted at a point by a unit charge at that point.</p> <p>A tachometer that uses voltage or electrical impulses.</p> <p>A diagram that shows the functional relationship among parts of a system.</p> <p>Abbreviation for gyroscope.</p> <p>A bridge that can be placed across conductors without disturbing their continuity.</p> <p>A wave with an electrical length of half a wavelength.</p> <p>A rectifier utilizing only one-half of each cycle to change alternating current into pulsating direct current.</p>
		C-1

Pamphlet Format

Sample Request for Feedback

Arial Bold 14 pt

Request for Feedback – Maneuvering Board

Suggestions and Corrections

Please note your suggestions, corrections, and comments below.

Page	Location on Page	What Correction is Needed

Arial Bold 12 pt.

Times 12 pt

Your Comments

If you were writing this pamphlet, what improvements would you make? What was good about it? What did you not like about it? Please be specific in your comments/suggestions.

To Contact You

Please provide the following so that we can contact you if needed.

Name	Unit	Phone
		()

Mail, Fax, or Call

Please mail, fax, or call your information to:

Commanding Officer (t-n)
U.S. Coast Guard
Training Center Yorktown
Yorktown VA 23690-5000
ATTN: RD Subject Matter Specialist

PHONE: (757) 856-2339
FAX: (757) 856-2242

Pamphlet Development Section

Overview

Pamphlet development involves several interrelated tasks. Those tasks include writing and illustrating the text, reviewing for technical accuracy, formatting tests, and conducting the formal review. A pamphlet may be comprised of one or more related units of instruction. Each unit is divided into lessons. Lessons are structured from the sequencing of both the terminal performance and enabling objectives.

Outline

This section includes the following:

- Writing the Text
 - Illustrations
 - Editing the Text
 - Camera-Ready Copy Submission
-

Procedure

The steps to follow to develop a course pamphlet are listed below.

Step	Action	Responsibility
1	Plan course strategy.	Subject Matter Specialist (SMS), Instructional Systems Specialist (ISS)
2	Group/sequence curriculum outline objectives.	SMS, ISS
3	Develop EOCT items. See test item bank development procedures.	SMS
4	Develop lesson objectives.	SMS
5	Review lesson objectives for consistency with curriculum outline objectives.	ISS
6	Research subject matter for each lesson objective.	SMS
7	Develop lesson self-quiz. See self-quiz development procedures.	SMS

Pamphlet Development

Procedure (Continued)

8	Develop lesson text in desired format.	SMS
9	Identify and add illustrations to text.	SMS
10	Review lesson text and illustrations for educational content and consistency with lesson objectives.	ISS
11	Make appropriate changes.	SMS
12	Conduct first edit.	Writer/Editor (W/E)
13	Make appropriate changes.	SMS
14	Conduct second edit.	W/E
15	Review content and make appropriate changes.	SMS
16	Repeat steps 4-15 for each subsequent lesson.	
17	Develop and add pamphlet review quiz and answer key. See pamphlet review quiz development procedures.	SMS
18	Prepare EOCT. See EOCT development procedures.	SMS
19	Add pamphlet cover, title page, etc.	SMS
20	Compile table of contents.	SMS
21	Determine reserve retirement points and add to curriculum outline cover page.	SMS
22	Conduct camera-ready copy edit.	W/E
23	Print the final copy, complete submissions forms, and mail to CGI.	SMS

Note: Depending on training source and staffing billets, the responsibilities for the ISS and/or W/E could be performed by other staff.

Writing the Text

Introduction

Plunging into the writing of an instructional pamphlet without some careful planning may be a good approach for a genius, but it won't work for most of us. Goals have to be set, limitations imposed, and the nature of the basic content determined.

Source Material

Before you begin to organize your course, you must gather facts and ideas from various sources. You are a specialist assigned to write in an area because you know the subject matter. Thus, your primary sources are your own knowledge and the resources of the Coast Guard. Other sources include:

- Existing Correspondence Courses. No doubt you have a professional library of your own, and existing correspondence courses may contain supplementary information. You can adapt such material to your purposes if it is appropriate.
 - Outside Sources. Even subject matter experts profit from consulting "outside" sources to keep themselves up-to-date and to get new ideas on how to present their information. You may find useful library resources where you work, as well as at the libraries of colleges, universities, and technical schools that are in the vicinity.
 - Other Services Correspondence Courses. You can also get copies of Army, Navy, Air Force, and Marine correspondence courses for reference material.
-

Factors Affecting Learning

There are many factors that affect learning. Six factors are discussed here.

- Motivation is considered the key to all learning. The student must want to learn if there is to be any learning of consequence.
 - Organization is the structured sequence of terms, facts, concepts, principles, procedures, and operations. Each element must be organized and presented in some structured sequence or pattern if it is to be learned easily.
 - Participation is a situation in which students learn by their own activity--mental and physical. You can increase the amount of participation by inserting questions throughout the text.
-

Writing the Text

Factors Affecting Learning (Continued)

- Confirmation (feedback) is the procedure by which students are told of their progress from time to time. Frequent self-quizzes, if correctly used, can help to sustain motivation. Normally, students become quite selective in learning. Students tend to avoid unsuccessful actions and shift their activity to other roads, which will lead to success. Selective feedback is most effective when students know why they are right or wrong. Feedback should be as immediate as possible. Delaying confirmation only interferes with the learning process.
 - Application. Students must be able to apply what they know to new situations. They must develop the ability to generalize and transfer new learning in order to retain it. The most important knowledge and skills are those that can be applied. The students must be able to transfer that knowledge to new tasks in new contexts.
 - Repetition reinforces confirmed actions and responses. It is very important for long-term retention of learning.
-

Teaching Through the Text

How do you create a course that will highly motivate and involve your students? Learning should be a "success experience" for the student, not a "frustrating experience." To ensure success, get a good match between the objectives of the course and the text materials that support the objectives. Practice comparing instructional materials with objectives and with your student's needs to determine where the materials are inadequate in accomplishing the objective.

The concept of writing course objectives and then creating the pamphlet to achieve these objectives is not new. Most big courses simply attempt to cover as much material as possible and hope to include all student needs. Sometimes the result is that the student knows the subject well but still cannot accomplish the original intent of the course.

The best way to develop an effective and efficient course is to present the student with only the subject matter that is needed to attain the course objectives.

Also, don't forget that your students do not know as much as you do; you are an expert in your field. Be careful not to lose them in technical mazes.

Writing the Text

Text Organization

Once you have selected text format, you then need to choose how to best present the material. The easiest way to organize the body of your material is to do it in stages. The following guidelines will help.

- Organize material using lesson objectives and distinguish between relevant and irrelevant supporting material.
- Determine the points you want to make. Words, ideas, or facts that are not essential to the understanding or acceptance of a specific objective can obscure and weaken it. To organize material, you should define, sift, and discard until only a clear objective and the ideas necessary to support it remain.
- Distinguish between the main and subordinate or supporting ideas. The main ideas are the basic explanations or arguments of the lesson objective. They are of equal importance to the objective and leaving one out unbalances the rest. The subordinate ideas are the facts, figures, or examples that support the main ideas. For example, the main ideas in describing an automobile might be the engine, transmission, chassis, and the body. Parts such as pistons or seats would be subordinate ideas.
- Group all related subordinate ideas together under the appropriate main ideas.

The next step is to arrange your main ideas in an order that leads the student systematically and logically to your conclusion. You want to select the method(s) that will present your subjects clearly and help the students satisfy the requirements of the lesson objectives. You can use one or more of the methods discussed below.

Go from the simple to the complex. Use this method when you have a series of topics that can be arranged in order of complexity (from the student's point of view).

Go from the known to the unknown. With this method of organizing your material, start with what your students know and build your lessons on that base. You can achieve this by relating job situations students may have experienced to the new material in the lesson.

Topical. This is probably the most common method used to organize course material. Use it to treat closely related subjects separately. With this method you should use parallel structure in your headings to show the relationship between subjects.

Writing the Text

Text Organization (Continued)

Order of Performance. Another method of organizing your material is introducing the steps in a process or procedure in the same order as they are performed. Backward chaining is a variation of this method in which the last step in the procedure is introduced first, then the next to last step along with the last step and so on back to the beginning. Each step is always learned in its correct sequence relative to those it precedes and follows. If you use this approach, you need to ensure that the steps ultimately are linked in their correct sequence.

Cause and Effect. Use this method to point out why an event took place, the effect of one event on another, or the relationships of a chain of events.

Contrast/Comparisons. Use this method to distinguish between two similar items or events. You can use it to point out how things that seem alike are different and how things that seem different are alike.

Definition. If you want your students to define a term, give them the definition first and then provide them with examples and non-examples, as appropriate.

Student-Centered Approach

The "ECI Guide for Authors" (Extension Course Institute) describes some general techniques for preparing your manuscript using a student-centered approach. These techniques are applicable to your course development method and are included in the following discussion. As you write, you should:

- Include essential text only.
- Provide details and examples.
- Help students understand what they read.
- Relate teaching material to job situations.
- Use graphics.
- Use analogies.
- Emphasize key information.
- Use reasonable text length.
- Use short, clear titles.
- Spell out titles of official publications.
- Create an interesting first assignment.
- Write for both men and women.
- Observe copyright laws and procedures.
- Manage text readability.

Writing the Text

Essential Text Only

Give your students all of the information they need to fulfill the objectives and complete the quizzes. This is the only information that the text should contain. Anything that does not contribute to the student's ability to achieve the objective does not belong in the text. You must take special care to avoid "nice-to-know" information.

Details & Examples

Whether you are teaching through a self-paced text or in a classroom, you must give your students the details and examples they need to understand the subject and apply the knowledge they gain. Before you begin to put together your text, gather the facts.

When writing a correspondence course, you should:

- Be brief and to the point.
- Give current information.
- Keep it simple, accurate, and relevant.
- Use examples to support your text to represent or amplify facts. Good examples are appropriate, brief, and interesting.

Giving examples without showing how to apply them can leave students in the dark. Always consider your audience; are they trainees, experts, or a combination of both?

Trainees. Suppose you are writing a course for trainees in oil geophysics (an imaginary rating). You write this:

Place the shot below the weathering so that ground roll will not affect recording of the reflection.

A student reads the sentence and has two questions: (1) What is weathering? (2) What is the relation of weathering to the recording? Perhaps a better way to write this would be:

Weathering roughly corresponds to the layer of earth between the surface and the ground-water table. Below this table, the rocks (depending on their permeability) are saturated with water. The slow earth waves that move horizontally through the weathering interfere with, and often obliterate, the faster waves that we are trying to record.

Writing the Text

Details & Examples (Continued)

Here, you defined a term that a beginner would not know and anticipated a question about the relation between weathering and recording that an alert student might be likely to think up. You eliminated a term "ground roll" that you did not need and that might be confusing.

Experts. If, on the other hand, your course is directed toward more experienced people, you could use the first version. Experienced people would probably know the terms and the problem you are describing. They would understand that you are reminding them of something important.

If you were writing a volume aimed at experts in oil geophysics, you could leave out any example. Perhaps--and this judgment would be up to you--you would not want to insult students by telling them the obvious.

Combination of Both. Sometimes you write a course directed at students who are on several levels of knowledge and competence. Coast Guard specialty courses, for example, are aimed at a varied audience. Here, it is best to aim your writing at a student with a reasonable level of knowledge and competence. If you do so, you will hit the inexperienced people most of the time, particularly if you are careful to define terms that might throw them.

Another thing you can do is to stop now and then and explain to your experienced students that the next section is written to define and introduce your subject to beginners. If the old pros know this material already, then they can skip over it. The first part of an assignment is a good place to do this.

Understanding What You Read

We all share one purpose: to produce texts that teach. Each sentence we write has one aim: to help students learn. We must adapt our personal writing style to make sure that the students understand what we write. You may need to translate complex regulations into easy-to-understand text segments that contain only the information essential to the student.

- Officialese. Almost everyone who works for the Government is exposed daily to "officialese." Directives, regulations, and daily bulletins are usually written in this strange language. Officialese is easy to recognize. It is written in the passive voice, uses the future tense, and issues orders.
-

Writing the Text

Understanding What You Read (Continued)

Example: "It has been observed that accidents increase during holiday periods. Therefore, personnel traveling during such periods will exercise the necessary caution required in order to prevent such accidents."

Nobody in particular has done the observing; everybody in general is ordered to be cautious. If you are used to officialese, you have already translated this example into something like:

"If you're driving anywhere over the holidays, be especially careful."

But why should you have to translate at all? A text is for teaching. Don't slow your reader down by using a formal, technical, impersonal style. Your text should speak simply and directly and avoid needless jargon.

- Word Usage. Use words your students can understand. Write simply. Short, familiar words will improve the quality of your writing. Avoid the following overused words and phrases:

Instead of this:

Accomplish
Afford an opportunity
Accordingly
Advantageous
Disseminate
Due to the fact that
During the periods when
Ensure that
Finalize
In lieu thereof
In regard to
In the event of
In view of
Majority
Not later than
Subsequent
Transpire
Ultimate

Try:

Complete, do
Allow, let
So, therefore
Helpful
Issue, get out, circulate
Because, since, hence
When
Make sure, see that
Complete, finish, include
Instead
About, concerning
If
Since
Most
By
Later, after, next
Occur
Final

- Sentence and Paragraph Structure. As you translate regulations, remember that the only true measure of readability is clarity. Sentence length, as well as word length, affects the students' ability to understand. Short paragraphs help the general appearance of the page and give the students a breather.
-

Writing the Text

Understanding What You Read (Continued)

- **Transitions.** To help your students associate material presented previously with upcoming material, use transitions. They help your students follow your line of thought. The following example illustrates how you can use a transitional paragraph to tie in previous material and to point forward to what is coming.

Example: As we have just explained, the echo you hear when you shout at a cliff face is caused by a velocity differential. The cliff rock may have a velocity of 15,000 feet per second, while the air’s velocity is about 1,100 feet per second. The application to earth seismology may seem obvious. However, before we go on to discuss this application, let us first list the various kinds of shock waves that can be propagated in rocks.

Use the following list as a guide to transitional words and phrases.

To add ideas	To contrast ideas	To show time
again also another besides first, second next, last finally in addition moreover furthermore now, however what’s more	but yet nevertheless however still conversely on the one hand instead of neither of these to the contrary on the contrary rather than much less than in contrast otherwise nor	immediately presently meantime afterward next as of today this year a little later then last year now finally
To compare ideas		To show results
like just as in the same way similarly likewise		therefore as a result thus for this reason on that account so consequently hence

Writing the Text

Understanding What You Read (Continued)

Using a nonexample might also be helpful in illustrating the use of transitions. Pointing verbally to what you have said and then to what you intend to say next does not make a transition. Once in a while you get text that is littered with one-sentence transitions of this type.

Nonexample: Now that we have discussed the adjustment of the range computer, let's discuss the adjustment of the range servo.

Such transitional efforts are called the "now-let's" plague. The use of "now" and "let's" in the nonexample illustrates "tags" rather than "transitions." Neither the "now" nor the "let's" element contains enough substance to show the students the relationship between the parts of a discussion. These words do not provide a "thought bridge," only a short rope that leaves the student hanging in a crevasse. Fill out the nonexample so that the students are reminded of what they have learned and will be guided in a new direction.

Example: The adjustment of the range computer establishes only the accuracy of the range information furnished to the range servo by the radar set. To complete the range calibration procedure, we must make the range-zero and slope adjustment of the range-servo unit. This adjustment determines the accuracy of the range information furnished the A-4 sight by the range-servo unit.

Relating Teaching Material to Job Situations

Set up a realistic teaching situation by addressing the students directly when you discuss tasks that they must do. Most people find procedures stated with active verbs easier to remember than those that use passive verbs.

- One trouble with passive construction is that it hides the doer of the action. At best, it makes for indirect and wordy writing; and at worst, it can be completely ambiguous.

Example: The fuel level **should be checked** each morning at the motor pool by the driver.

If the student is the driver, state simply:

Check the fuel level each morning at the motor pool.

Writing the Text

Relating Teaching Material to Job Situations (Continued)

This direct address to the reader is simple, short, and clear. What more can you ask? In any event, identify the doer.

The **driver checks** the fuel level each morning at the motor pool.

- Here is another example of procedural instructions that, as presently written, may or may not apply to the students.

Example: Once the popping pressure **is adjusted** and the relief valve **is closed**, the adjusting screw **is locked** in place with the safety nut, as shown in figure 3-2.

If your students must do the adjusting, say so.

Once **you have adjusted** the popping pressure and closed the relief valve, lock the adjusting screw in place with the safety nut, as shown in figure 3-2.

When the students must be able to do the task, make them the center of the action. When the students' role is secondary, specify their responsibilities. When the material you are giving the students is merely background information, tell them so.

Even when you are presenting general information, explaining principles, or discussing theories, remember that you are writing for individuals. Address your students and make them feel that you are talking to them. Also, when you write in this direct manner, you probably will write shorter, clearer sentences. But don't feel compelled to get a "you" in every sentence. Address the student when it is natural.

Using Graphics

Part of your job as a course developer is to learn what you should illustrate graphically and how it should be illustrated. You can probably think of a hundred ways in which you can use illustrations to improve your teaching. Instructions for illustrating your text are provided in the section "Illustrations." Some examples you can use include:

- Schematics. You may use schematics to explain complicated, electrical circuits.
-

Writing the Text

Using Graphics (Continued)

- Forms. Many courses have various forms, either completed as samples or to be completed by students in exercises.
 - Tables and Charts. You may summarize long segments of text or even replace text segments by using tables and charts.
 - Line Drawings. You may use a foldout or line drawing of a piece of equipment and then have an exploded view or cutaway drawing of its subelements.
-

Using Analogies

By now, you know that some ways of presenting your course materials are more effective than others in terms of desired learning results. An analogy can sometimes help students comprehend an otherwise difficult-to-understand concept. An analogy is an extended comparison.

Example #1: What happens when a seismic shock wave is recorded is extremely complicated. Roughly, it is similar to the reflection of a sound wave from a cliff face. When you shout at a cliff, the sound comes back to you because the rock's shock-wave velocity is greater than that of the air. This suggests that, in the earth, seismic waves reflect from an interface, say, of a shale and a limestone, where the limestone's velocity is higher than the shale's.

Example #2: Imagine a bathtub filled with irregular piles of sand. Now, run water into the tub slowly. Notice how the water level rises --filling the depressions and moving up the "valleys." Turn off the water. If you were to "draw" a continuous line at the water level, you would have a contour line that could be shown graphically on a contour map. Now, if you were to run in another inch of water and "draw" another line, you would have a second contour on the map. Your contour interval would be 1 inch. Contour maps are meant to show you the form and shape of the Earth's surface.

Writing the Text

Key Information

To emphasize key information, you should:

- Use boldface headings for emphasis.
 - Use bullets to flag a few short statements or to announce topics you plan to discuss in a lesson. Use a different bullet to display subordinate text elements.
 - Talk about one point at a time. Present the essential information clearly; then, go on to the next point. Do not overwhelm the students with printed text for a few key points.
 - Break up a long passage of solid text by making a list of the main ideas. A list gives some white space on the page and also helps the students to pick out the important ideas more easily. Do not overdo listing. Most lists should have no more than seven elements, and seldom should two lists be on the same page.
-

Text Length

One of the purposes of lesson objectives is to tighten text development. If properly defined, the objectives--as well as specifying the nature of the exercises--control both the content and length of the text that support them. A well-developed lesson should not exceed 7 to 10 manuscript pages. Conversely, don't make your segments choppy. Develop ideas fully without unnecessary division of material.

- Each pamphlet should be complete in itself, the length (within limitations) to be determined by its subject. From the student's point of view, the ideal length of a correspondence course pamphlet is 75 to 100 pages in the printed form. Try for the ideal limit and consider anything over 150 pages as too long.
 - Special emphasis should be placed on shortening courses of more than 6 pamphlets or over 600 pages. The best performance results have been reported for the short, one-to-three volume courses.
 - If a pamphlet is so long that it cannot be adequately covered in 75 to 150 printed pages, consider breaking it down into two or more pamphlets, with additional pamphlet numbers assigned as required by the split.
-

Writing the Text

Short, Clear Titles

A title for a lesson assignment should clearly state what is in the lesson. If possible, it should also be interesting; a short title is better than a long, involved one. The title for this section, "Writing the Text," is typographically attractive and hopefully more interesting to you than "Important Considerations in Developing Materials for Correspondence Courses."

Spell Out Titles

The first time you mention a publication or form, give the complete title and the identifying number as it appears in current indexes. You may give a title more than once if you need to. Also, spell out acronyms the first time you use them in the text.

Example #1: Directives, Publications, and Reports Index, COMDTNOTE 5600

Example #2: Search and Rescue (SAR)

First Lesson

The first lesson is always critical since it is the first material the students see. It typically introduces the course and sets the tone for future study. The techniques for creating a highly interesting and motivational first lesson can be applied to the entire course. Here are some questions to ask yourself concerning your first lesson.

- Is the text under 20 pages? (A length of 7 to 10 pages is ideal.)
 - Is it properly illustrated?
 - Is there a brief restatement of the benefits of the course?
 - Is it generally nontechnical and inspiring?
 - Does it contain a deliberately easy self-quiz or review exercise? (Student gains confidence.)
 - Is there a clear transition leading to the next lesson?
-

Writing the Text

Avoiding Sex Bias

Until recently, most writing used the masculine pronouns "he," "him," and "his" generically to denote both women and men. There was also a tendency to stereotype jobs--all electricians were men and all nurses women. In the past few years, this has changed considerably. The technician who comes to change your fluorescent tubes may be a woman. The nurse who takes your pulse at the clinic may be a man. Most ratings today include both males and females.

For that reason, we should address our instruction to both sexes. The Coast Guard Directives System, COMDTINST M5215.6 (series), requires that we use sex-neutral language when possible. It offers several good tips on how to do so. The following guidelines are taken from that instruction and apply to the preparation of all new courses and to revisions of existing courses:

- Do not typecast. Ability to fill a job and competency in that job are not a matter of gender. Men and women should be even-handedly portrayed as lawyers, secretaries, committee members, executives, homemakers, etc.

Avoid

businessman
mailman
policeman

Use

business executive
mail carrier, letter carrier
police officer

- Avoid implications that any position or role is more "fitting" for either men or women.
- Do not make assumptions. Never assume the sex of an unknown person.
- Never use "he" or "she" to lump men and women together. Avoid the use of the pronouns (he/she, him/her, his/hers) when referring to an unknown or hypothetical person or humanity in general. Avoid gender specific words when there is an alternative term in common use or when rewording will remove the gender aspect.

Avoid

Mankind

Use

People, persons, human kind,
humanity, human beings

Writing the Text

Avoiding Sex Bias (Continued)

Avoid

best man for the job
man-made
manpower

man-hours
manning charts
bachelors

The average American can no longer fill out his tax return.

- Replace occupational terms ending in “man” with terms, in common use, that include members of either sex.

Avoid

congressman
serviceman
crewman

Use

best person (candidate) for the job
artificial, synthetic
workers, workforce, labor force,
human resources

staff hours
staffing charts
single members, single persons,
singles

Most Americans can no longer fill out their own tax returns.

Or

The average American can no longer fill out a tax return.

Use

member of congress or
representative
service member
crewmember

- Similarly, use gender-specific words associated solely with women.

Avoid

police matron
coed
authoress
stewardess

Use

police officer
student
author
flight attendant

Writing the Text

Avoiding Sex Bias (Continued)

- Avoid the implication that there are nontraditional roles for men or women or that people filling certain roles are exceptions.

Avoid

lady economist
lady boss
woman lawyer
male nurse
male secretary

Use

economist
boss, supervisor
lawyer
nurse
secretary

- Similarly, do not link gender specific pronouns with certain work or occupations with the implication that the worker is always or usually female or male.

Avoid:

The average worker with a wife and two children has lost 13 percent of his income to inflation.

Use:

The average family of four . . .
or

The average worker with three dependents . . .

Avoid:

When the consumer goes to the grocery store, she will find . . .

Use:

When consumers go to the grocery store, they will find . . .

- Where no gender-free term has yet achieved widespread acceptance, use terms that accurately identify the sex of the person referred to.

Examples:

chairman	chairwoman
spokesman	spokeswoman

- Where neither a gender-free term nor any term accurately designating gender is yet in common use, continue to use gender specific terms, even where not literally accurate.

Examples:

Yeoman Third Class Mary Smith
Seaman Apprentice Jane Smith

Writing the Text

Avoiding Sex Bias (Continued)

If you use photos and illustrations, follow these guidelines: Show a variety of occupations and dress for men and women. An occupation or hobby should not be shown as either "masculine" or "feminine" and should not reflect on anyone's masculinity or femininity.

Copyright Laws

You must get permission in writing from the owner of the copyright, author, or publisher when you:

- Use parts of copyrighted publications, whether text or illustrations.
- Quote any passage of more than one or two sentences from copyrighted materials.
- Rely on copyrighted publications as your main source, even though you paraphrase.

Exception: Books, which are published by the U.S. Government, are in the public domain and may not be copyrighted. However, if the publication from which you borrow contains copyrighted material, you are the "second borrower" and must get permission from the copyright owner.

When you request permission to use copyrighted material, inform the owner that the material will be published by the Coast Guard for use by Coast Guard personnel. Request permission to use copyrighted material about specific subject matter in a training course for Coast Guard personnel. A sample letter requesting copyright releases is provided on the following page.

When permission is granted, the copyright release will be placed in the permanent files of the training source. Copies of the letter will be kept in the training source subject matter specialist's files and with the camera-ready copy (CRC) of the pamphlet in which the material will be used.

If you quote from copyrighted sources, prepare an acknowledgment page to be placed in the front of the pamphlet. If the copyright owner specifies the form of the acknowledgment or credit lines, set up your credits as requested.

Writing the Text

Text

Readability

The best-designed course will be wasted if the student is unable to read it easily. If your students are able to read easily, they will be more likely to finish the course and pass the end-of-course test. To write a manuscript that can be easily read, you must know what affects readability.

Reading ease depends on the writer's style and the design of the printed page. The main factors to consider are the style of the typeface, the ratio of space between words and space between lines, and column width (length of each line in print).

A writer's style is more difficult to control, but is far more important than the printing style. It is essential that all writers know the principles of clear writing and that they use them.

Readability Statistics

It is always a good idea to check the readability level of your text. In Microsoft Word, readability statistics are displayed after you run a grammar check.

A manual readability formula that is easy to use is the Fog Index. This formula is reliable and may be used to determine the reading level of your text materials. See the procedure and example on the following pages to apply the Fog Index.

Writing the Text

Fog Index Procedure

The steps for determining the Fog Index of a narrative text are listed below:

Step	Action						
1	Select a sample passage of approximately 100 words.						
2	Assign a value of 1 to all one- and two-syllable words.						
3	Assign a value of 3 to all remaining words.						
4	Determine Fog Index by adding the values.						
5	Divide the Fog Index by the number of sentences						
6	<table border="1"> <thead> <tr> <th>IF the average Fog Index is . . .</th> <th>THEN to obtain the grade level, you should . . .</th> </tr> </thead> <tbody> <tr> <td>over 20</td> <td>divide by 2</td> </tr> <tr> <td>under 20</td> <td>subtract 2, then divide by 2</td> </tr> </tbody> </table>	IF the average Fog Index is . . .	THEN to obtain the grade level, you should . . .	over 20	divide by 2	under 20	subtract 2, then divide by 2
IF the average Fog Index is . . .	THEN to obtain the grade level, you should . . .						
over 20	divide by 2						
under 20	subtract 2, then divide by 2						

Writing the Text

Applying the Fog Index

1. Select a sample passage of approximately 100 words:

3

To avoid what he called the “swindles and perversions” of language, George Orwell

3

recommended six rules for writing right:

3 3

1. *Never use a metaphor, simile, or other figure of speech which you are used to seeing in print.*
2. *Never use a long word where a short one will do.*
3. *If it is possible to cut a word out, cut it out.*
4. *Never use a foreign phrase, a scientific word, or a jargon word if you can think of an everyday equivalent.*

3

Break any of these rules sooner than say anything outright barbarous. (101)

2. Assign a value of 1 to all one- and two-syllable words. 92
 3. Assign a value of 3 to all remaining words. 27
 4. Determine Fog Index by adding the values. 119
 5. Divide the Fog Index (119) by the number of sentences (7). 17
 6. Since the average Fog Index is under 20, subtract 2 then divide by 2 to obtain grade level. (If the average Fog Index is over 20, divide by 2 to obtain grade level.) 7.5
-

Writing the Text

Increasing Course Completion Rates

Assume that you have achieved a first-rate opening assignment, followed by subsequent assignments, which meet most of the characteristics on the checklist described earlier in this section. What can you do to achieve high graduation rates?

Keep it short. There is nothing less motivating to students than realizing there are 15 books to read in the course. Anything that you do to reduce their study time, while not compromising quality or learning effectiveness, will help to get them started faster and finished sooner. By eliminating unnecessary assignments and keeping the remaining assignments short and to the point, you not only will get more students to finish sooner, but also you will reduce costs.

Nonresident training is, after all, independent study. Remember--do not give the students more than they need to know to achieve the stated course objectives.

Illustrations

Illustrating Your Course

Illustrations greatly enhance the learning experience of the student by providing a visual presentation of text material. Good illustrations make difficult concepts easier to understand and, in many cases, allow the student to grasp in a single glance what would take pages of written material to explain.

The creation of an illustration is a very important aspect of course development. The SMS must determine the objective of each illustration. The SMS may want to portray a situation that is difficult to describe in words or may want to clarify the relationship between items. Whatever the objective, the SMS must decide the type of illustration to use, the points to emphasize, the amount of detail required, and the size of the illustration.

Sources for Illustrations

After the SMS decides what the illustration should show and before creating a new illustration, the SMS should check other sources where the illustration may be available. Possible sources are:

- Other SMSs
- CD-ROMs containing Clip Art and Photographs
- Clip Art
- Computer Graphic Library
- Internet
- Naval or Other Publications
- Technical Manuals

The original source may have a camera-ready illustration that the source will supply on request or for a slight fee. With computer technology, poor illustrations can be scanned and cleaned-up. Remember, any lack of clarity in an original illustration will become worse when it is printed.

Copyright

Illustrations in print are protected by copyright just as any other printed materials. The SMS should check to determine whether the material is protected and obtain copyright permission. Refer back to the information on copyright laws in this section for procedures to follow in obtaining permission to use copyrighted material.

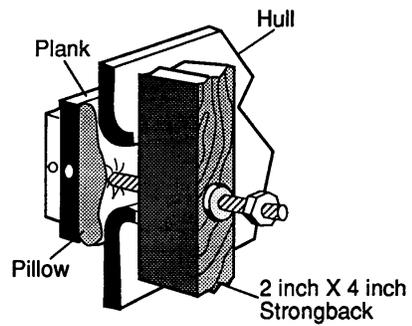
Illustrations

Line Drawings

A line drawing is any illustration made through the skills of an artist or by computer. Line drawings must:

- ⇒ Be sharp and clear.
- ⇒ Contain crisp black lines on a clean, white surface.

Example:



Illustrations

Illustration Captions

Block labels are used to identify illustrations in the structured writing format.

Text Reference to Illustrations

Illustrations become part of the text in a structured writing format. If referencing an illustration on another page, identify the illustration by its block label or page number.

When illustrating instructional text, remember these guidelines:

- Use clear, concise illustrations that concentrate on only the essential parts.
- Ensure consistency in technique.
- Show the correct relationship of tools to hands (or other portions of the body) and parts.
- Make sure the perspective or point of emphasis you choose is the clearest one possible to show movement, and remove any detail that is not essential to the instructional meaning. Use blow-ups or inserts to show important details from larger parts or systems.
- Label only the parts that you want to draw the learner's attention to, but include enough information on the location of particular parts. Mention each illustration in the text before it appears in its illustrated format.
- Place illustrations directly below or next to the textual description of the illustration.

If you use copyrighted material, be sure to get written permission of the copyright holder.

Editing the Text

Introduction

Perfect manuscripts do not just happen; they are the result of many hours of editing. Error-free manuscripts assure students that time, effort, and care have gone into the preparation of the course. Students are likely to spend more time and devote more concentration on a course that has few typographical errors. The writer/editor conducts three separate edits.

- First edit
 - Second edit
 - Camera-ready edit
-

First Edit

The first edit is a thorough edit conducted on each lesson as the lesson is developed. The writer/editor conducts the edit using the editing symbols listed on the following page and discusses the revisions with the SMS. The writer/editor completes the first half of the first/second edit checklist.

Second Edit

In the second edit, the writer/editor rereads the entire lesson, paying particular attention to changes made by the SMS, and marks any additional editing changes. When necessary, the writer/editor again discusses the revisions with the SMS. The writer/editor completes the second half of the first/second edit checklist.

Camera-Ready Edit

The writer/editor conducts the camera-ready edit after the SMS has completed the entire pamphlet. The SMS should ensure that all of the required pages are inserted as well as the pamphlet review quiz, for this should be the last review before submission to CGI for printing. The writer/editor edits all material in addition to the lessons (i.e., cover page, table of contents, appendixes, title page, notice to students, acknowledgments, and references) and completes the camera-ready edit checklist.

Editing the Text

Editing Symbols

Writer/editors use the following editing symbols to edit lessons. Everyone involved in the course development process should become familiar with these symbols, as you will see them often.

⊙	Insert period	≡	Caps--used in text
↗	Insert comma	<i>l.c.</i>	Lowercase--used in margin
:	Insert colon	//	Align vertically
;	Insert semicolon	<i>g</i>	Delete
?	Insert question mark	<i>g</i>	Delete and close up
!	Insert exclamation mark	<i>w.f.</i>	Wrong font
=/	Insert hyphen	⊂	Close up
↘	Insert apostrophe]	Move right
“ ”	Insert quotation marks	[Move left
#	Insert space	↗	Move up
✓	Superior	↘	Move down
∧	Inferior	...	Let it stand--used in text
()	Parentheses	<i>stat.</i>	Let it stand--used in margin
[]	Brackets	<i>run over</i>	Carry over to next line
¶	Paragraph	<i>run back</i>	Carry back to preceding line
<i>no</i> ¶	No paragraph	~~~~~	Boldface--used in text
<i>~</i>	Transpose--used in text	<i>h.f.</i>	Boldface--used in margin
<i>sp</i>	Spell out	<i>—</i>	Italic--used in text
/	Lowercase a letter (make it a small letter)	^	Caret--Used to mark position of error where material needs to be added

Editing the Text

Roles and Responsibilities

The roles and responsibilities of the SMS and the writer/editor are identified below.

SMS Responsibilities

The SMS responsibilities are to:

- Obtain copyright permission.
 - Spell check the lesson.
 - Number all of the pages.
 - Include and identify all illustrations within the text.
 - Ask another SMS or someone in the resident school to read the completed lesson. An expert in the field who has not developed the material may be able to point out errors the SMS missed.
 - Provide the writer/editor with a hard copy of a complete lesson that contains the following:
 - ⇒ Lesson objectives
 - ⇒ Text
 - ⇒ Self-quiz
 - ⇒ Answer key
 - Make corrections to the lesson after each edit, checking every correction to ensure that it was made properly and that making the correction did not cause a new error.
 - Submit the lesson, as well as the edited (marked-up) copy, to the writer/editor for the second edit.
 - Provide a hard copy of the entire pamphlet to the writer/editor for camera-ready review.
-

Editing the Text

Writer/Editor Responsibilities

The writer/editor responsibilities are to:

- Conduct the first edit of each lesson using the editing symbols.
 - Rewrite and reorganize the lesson as necessary.
 - Discuss the changes with the SMS.
 - Review the changes made by the SMS.
 - Conduct the second edit.
 - Complete the first/second edit checklist.
 - Conduct the camera-ready edit.
 - Complete the camera-ready edit checklist.
-

Editing the Text

First/Second Edit Checklist

The first/second edit checklist includes the following:

EDIT CHECKLIST		1st	2nd
TEXT	Spacing is consistent between titles, subtitles, bullets, etc.		
	Format agrees with standardized guidelines.		
	Organization, abbreviations, and punctuation are correct and consistent.		
	Sexist language is removed.		
	Lesson is grammatically correct.		
	Pages are numbered consecutively by lesson.		
ILLUSTRATIONS	Quality of illustrations is acceptable.		
	Placement of illustrations is acceptable.		
SELF-QUIZ	The lesson has a self-quiz.		
	Questions are in the same order as text material.		
	Items are consecutively numbered.		
	End of stem punctuation is correct.		
	Multiple-choice items have ABCD.		
	Multiple-choice blanks are five underlines.		
	Reference page numbering is checked.		
	All answers are provided, but are not visible while reading questions.		

Editing the Text

Camera-Ready Copy Checklist

The camera-ready copy checklist includes the following:

CAMERA-READY COPY CHECKLIST		
REQUIRED PAGES	Cover page	
	Title page	
	Acknowledgments (if needed)	
	Notice to Students	
	Table of Contents	
	References	
	Blank pages	
	Request for Feedback	
SELF-QUIZZES	Reference page numbering is rechecked.	
PAMPHLET REVIEW QUIZ	Question numbering is checked.	
	Multiple-choice items have ABCD.	
	End of stem punctuation is correct.	
	Reference page numbering is checked.	
TEXT	Page numbering is correct.	
	Blank pages are added if necessary.	
APPENDIXES	Page numbering is correct.	
	Page numbering is correct.	
	Required pages are listed.	
	Content titles are consistent with text.	

Camera-Ready Copy Submission

Camera-Ready Copy

The final step in producing courses is printing the pamphlets. To ensure the best quality printing, CGI must provide the printing source the best quality pages. These pages, called camera-ready copy (CRC), are produced by the SMSs. All camera-ready copy pamphlet material must be printed on a laser quality printer. The laser quality printer is equipped to give the darkest impression possible.

Note: Check with CGI prior to submitting CRC for latest instructions. Electronic transmittal may be an alternative method.

Letter to the Institute

The SMS submits camera-ready copy of new or revised pamphlets or courses by letter to CGI. The letter will contain at least the following information:

- Name of each pamphlet (component) clearly identified by pamphlet, course, and course code.
 - A list for each pamphlet of photos and illustrations that require enlargement/reduction. Each photo/illustration to be enlarged/reduced must be tagged to show figure, page, pamphlet number, and percentage of enlargement or reduction. Each photo/illustration should be cropped, as required.
 - Any factors that would affect the reorder quantity, such as expected new qualifications or massive reenrollments.
-

Enclosures to Letter

In addition, the letter will contain the following enclosures:

- Course and Inventory Control Sheet - Create/Modify Course (CGI-2834) or Course and Inventory Control Sheet - Delete Course (CGI-2834a). See samples with instructions on the next pages.
 - Camera-ready copy of each pamphlet. The entire pamphlet CRC is not required to be sent when individual CRC pages are submitted to replace pages existing in current pamphlets.
 - Previous edition of pamphlet, when applicable. If you are submitting a pamphlet revision, provide a copy of the old pamphlet (with the pages to be revised X'd out) to CGI. This X'd out pamphlet is to be sent by the SMS with the CRC of the revised pages.
-

Print Quantity

Initial print and reprint levels will be determined by CGI after consultation with the training source, as necessary.

Camera-Ready Copy Submission

Course and Inventory Control Sheet - Create/Modify Course (instructions)

INSTRUCTIONS FOR THE PREPARATION AND USE OF THE COURSE AND INVENTORY CONTROL SHEET - CREATE/MODIFY COURSE (CGI-2834)

The training source should complete all appropriate bold face blocks on CGI-2834 as needed for processing. CGI should complete all appropriate non-bold face blocks on CGI-2834 as needed for processing.

1. **Course Code.** Enter the 4-digit course code for this new course/edition. If it is a new course code, check with pro-1 for code numbers.
2. **Course Edition.** Enter the edition for this new course/edition (from pro-1) (Max 2 digits)..
3. **Ace Identifier.** Enter the ACE Identifier number (Max 10 characters).
4. **Short Title.** Enter the short title for this new course/edition, e.g., YN7, MRN-E5 (Max 6 characters).
5. **Long Title.** Enter the long title of the new course/edition being created (Max. 69 characters).
6. **Description.** Enter a description of the course/edition (Max 350 characters).
7. **Edition Date.** Enter the intended date the new course/edition begins.
8. **Passing Score.** Enter the passing score for the new course/edition (Max 3 digits).
9. **Reserve Points.** Enter the number of points a Reserve may earn by completing this course. Refer to the Course Development Manual for instructions to compute reserve retirement points (from curriculum outline) (Max 9 digits).
10. **Course Duration.** Enter the maximum time in months the student will have to complete this new course/edition (Max 6 characters).
11. **Security Class.** Enter "U" if this new course/edition is unclassified, "C" if it is confidential, and "S" if it is secret.
12. **Status Code.** If this is a new course, enter "N". If this course is going obsolete, enter "O". If this course is active, enter "A".
13. **Billet Code.** Enter the responsible rate for this course/edition (Max. 6 characters).
14. **Branch.** Enter the branch responsible for this course/edition (1 character).
15. **Course Limiter.** If everyone can enroll in this new course/edition, leave blank. If you would like to allow only Auxiliarists to enroll, enter "XONLY". If you would like to limit Auxiliarists from enrolling, enter "XNO". All classified courses should be marked "XNO".
16. **Component Code.** Enter the 6-character component number that will be part of this new course/edition. Contact the CG Institute(pro-1) for assignment of a component number.
17. **PS(Print Source).** Enter 2-character print source.
18. **DS(Document Size).** Enter 2-character document size.
19. **CW(Component Weight).** Enter 2-digit component weight.
20. **Component Name.** Enter the component name, a maximum of 39 characters.
21. **Price.** Enter price to produce 1 component (Max 7 digits).
22. **NSN(National Stock Number).** Enter National Stock Number (Max 15 characters).
23. **Publish Date.** Enter the date the component was first published.
24. **QTYS(Quantity Stocked).** Enter total quantity stocked at Institute (Max 5 digits).
25. **QOH(Quantity On Hand).** Enter current quantity on hand (Max 5 digits).
26. **Low Limit.** Enter low limit. If inventory drops below this amount pro will be warned on an error report (Max 5 digits).
27. **RE/L(Re-order level).** Enter amount of components to be ordered with each re-order (Max 5 digits).
28. **BCN(Billet Control Number).** Enter the responsible rate (Max 6 characters).
29. **TC(Type Code).** Enter component type code. "CH" = Chart "CP" = Commercial Publication "DD" = Department of Defense Pub. "DV" = Dividers "FS" = Frequency Scale "HB" = Handbook "MB" = Maneuvering Board "MP" = Manual Publication "N" = Notice to Students "PG" = Pocket Guide "PH" = Pamphlet "PS" = Plotting Sheets "TA" = Triangle "TB" = Test Booklet and "VT" = Video Tape.
30. **SC (Security Class).** Enter "U" if the component is unclassified, "C" if it is confidential and "S" if it is secret..
31. **Order Date.** Enter last order date.
32. **E (Expendable Materials).** Enter X the component is expendable, enter "N" if the component is non-expendable.
33. **QPC (Quantity Per Course).** Enter the number of components (for that component code) that will be issued with this course. This can be from 01 to 99.

Camera-Ready Copy Submission

Course and Inventory Control Sheet - Delete Course (instructions)

**INSTRUCTIONS FOR THE PREPARATION AND USE OF THE
COURSE AND INVENTORY CONTROL SHEET - DELETE COURSE (CGI-2834a)**

The training source should complete all appropriate bold face blocks on CGI-2834 as needed for processing. CGI should complete all appropriate non-bold face blocks on CGI-2834 as needed for processing.

1. **Course Code.** Enter the 4-digit course code for this new course/edition. If it is a new course code, check with pro-1 for code numbers.
2. **Course Edition.** Enter the edition for this new course/edition (from pro-1) (Max 2 digits).
3. **Obsolete Date.** Enter the obsolete date. No course materials or tests will be sent after this date. All completed EOCTs will be rejected and NOT graded by CGI if administered after this date.
4. **Replacement Edition.** Enter the replacement edition for this new course/edition (from pro-1) (Max 2 digits).
5. **Component Code.** Enter the 6-character component number that will be deleted from this course/edition.
6. **Delete From Course.** Enter "Y" to delete this component from this course edition.
7. **Delete From Inventory.** Enter "Y" to delete this component from inventory. This will COMPLETELY remove this component from the system at CGI.
8. **Remarks.** Use as needed.

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Appendix E

TEST ITEM DEVELOPMENT

Test Item Development

Overview Performance-based, criterion-referenced testing requires students to demonstrate only the performance of objectives. Therefore, they are tested only on what they need to know to perform their job. Write test items so they relate directly to the performance objectives to ensure students display the same type of performance as in the objectives. Test items for servicewide examinations (SWE) are developed from enlisted performance qualifications independent of course development.

Outline The three areas involved with the development of test items include:

- Matching Test Items to Objectives
- Test Item Format
- Test Item-Writing Principles

Procedure Test items should be written and approved before they are used on an end-of-course test (EOCT) or SWE. The steps are listed below.

Step	Action	Responsibility
1	Review quals/JPRs/objectives and references depending on the exam.	Subject Matter Specialist (SMS) or E-9 for SWE items.
2	Develop new items or revise old items and enter into the test item database (add illustrations if necessary).	SMS
3	For an EOCT item, have another SMS review item. If an SWE item, only the appropriate E-9 for the rating should have access to the item.	SMS
4	Review for educational content and for consistency with quals/JPRs/objectives.	Instructional Systems Specialist (ISS)
5	Make appropriate changes.	SMS
6	Conduct first edit.	Writer/Editor (W/E)
7	Make appropriate changes.	SMS
8	Enter approval and/or revision date to new and revised items.	SMS

Note: Depending on training source and staff billets, the above responsibilities for the ISS and/or W/E could be performed by other staff.

Test Item Development

Breakdown of Responsibilities

The responsibility for developing test items for self-quizzes/topic reviews, pamphlet review quizzes, and EOCTs is shared among the subject matter specialist, the instructional systems specialist, and the writer-editor. For SWE questions, the responsibility is shared among the appropriate E-9 for the rating, the instructional systems specialist, and the writer editor. A breakdown of the responsibilities during the review phase of test item development is outlined below.

Subject Matter Specialist (SMS) or appropriate E-9 for the rating:

- Reviews each test item for content, currency, accuracy, validity, and single correct response.

Instructional Systems Specialist (ISS):

- Test Items - Reviews each new test item for consistency with quals, JPRs, and objectives and for educational content; reviews items with answers for clarity, relevance, ambiguity, cueing, appropriateness of illustrations, and order and validity of distractors.

Writer/Editor (W/E):

- Corrects spelling, punctuation, capitalization, grammatical structure, sexist language, clarity, active voice, and positive statement.
- EOCT and SWE Review – Reviews each test for cueing, question sequencing, answer patterns, and item repetition or similarity.

Note: Depending on training source and staff billets, the above responsibilities for the ISS and/or W/E could be performed by other staff.

Test Item Database

Test items for EOCT and SWE are developed and stored in a test item database. Each item must be reviewed and approved by the SMS or E-9 for the rating, ISS, and W/E before used on a test.

Note: The Course Writers Database (CWDB) will be phased out and replaced by a new database called Gemini Test Item Database (TID). [Appendix F](#) to this SOP is a job aid on how to use this new database.

Matching Test Items to Objectives

Introduction

As discussed previously, tests developed for your course are performance-based, criterion-referenced tests. What this means is the test items must match your performance objectives. The decision table below will help you identify by test which objectives to base your item on.

IF you are developing the . . .	THEN your test item must match the . . .
self-quiz/topic review	lesson objective.
pamphlet review quiz	lesson objective.
EOCT	performance objective (TPOs and EOs).
SWE*	Enlisted Performance Qualifications.

* The SWE is not a criterion-referenced test; it is a norm-referenced test. The development of test items for the SWE is based on the Enlisted Performance Qualifications outlined for each rate in the Enlisted Qualifications Manual, COMDTINST M1414.8 (series).

Matching Test Items to Objectives

Test Item Matching

You construct your test item to match the action verb called for in the performance objective. The following chart will help you determine which type of question will match a particular action verb.

IF you use this verb in the objective . . .	THEN use this type of item on your test . . .			
	SHORT ANSWER	MATCHING	MULTIPLE CHOICE	PERFORMANCE
APPLY	X		X	X
CALCULATE	X		X	X
CLASSIFY		X	X	
COMPUTE	X		X	X
CONVERT	X		X	X
DEFINE	X	X		
DEMONSTRATE	X		X	X
DETERMINE	X		X	X
DESCRIBE	X			
DISCRIMINATE		X	X	
IDENTIFY	X	X	X	X
LABEL	X	X		
LIST	X			
MATCH		X		
SELECT	X	X	X	X
SOLVE			X	X
STATE	X			
SUMMARIZE	X			
TROUBLESHOOT	X		X	X

Matching Test Items to Objectives

Development Process

A performance objective identifies the job performance you want your student to achieve at the end of a lesson, a pamphlet, or a course. How you measure that achievement depends on the design of your test items. The following chart shows the process of developing test items from performance objectives, starting with the enlisted performance qualification and ending with the pamphlet review quiz test item. When you develop test items, remember to write the performance objective first. Then write test item(s) to match that objective. This process is completed BEFORE you develop the test or write the course.

The servicewide exam items are based on the performance qualifications and are written independent of course development. The SWE items cover tasks, skills, and knowledge needed to perform the enlisted performance qualifications.

COMPONENT	EXAMPLE
Enlisted Performance Qualification (EPQ)	BM EPQ D4.01 MAINTAIN cutter and/or small boat surfaces to include hull, underwater body, decks, and all related fittings and equipment (interior/exterior) IAW Coatings and Color Manual, COMDTINST M10360.3 (series) and Boat Operators Handbook.
Performance Objectives	<p>Terminal Performance Objective (TPO): Generally the EPQ becomes the TPO. However, if the EPQ does not contain a performance, conditions, and/or standards, you should write the TPO using the design principles of a good performance objective.</p> <p><u>Note:</u> Not all EPQs are written with condition statements (as in the EPQ above).</p> <p><u>Example</u> Given surface condition, technical publications, and appropriate tools and materials, MAINTAIN cutter and/or small boat surfaces to include hull, underwater body, decks, and all related fittings and equipment (interior/exterior) in accordance with Coatings and Color Manual, COMDTINST M10260.3 (series) and Boat Operators Handbook.</p>

Matching Test Items to Objectives

Development Process (Continued)

COMPONENT	EXAMPLE
Performance Objectives, continued	<p>Enabling Objective (EO): EOs are task steps (or groups of task steps) that support the TPO. EOs are identified during the task analysis.</p> <p><u>Example</u> Given metallic and masonry surfaces that contain rust, mill, scale, and oil paint, SELECT the appropriate power tool to use to remove rust in accordance with COMDTINST M10360.3 (series).</p>
SWE or EOCT Item	<p><u>Example #1</u> You are burning paint off a wooden surface. After blistering the paint, you should start scraping _____. A. after the blisters break B. while the paint is hot and soft C. after cracks appear in the cooled paint D. when the paint cools and becomes brittle</p> <p><u>Example #2</u> When painting an exterior surface, which paint should you select to produce a nonporous, hard, durable chemical-resistant surface? A. Mare Island Epoxy B. Silicone Alkyd Enamel C. Interior Enamel Undercoat D. Exterior Gloss Resin Enamel</p> <p><u>Example #3</u> What power tool should you use to remove rust from a large metallic area? A. Sander B. Grinder C. Wire brush D. Rotary or needle scaler</p>

Matching Test Items to Objectives

Development Process (Continued)

COMPONENT	EXAMPLE
Lesson Objective(s)	<p>Lesson objectives guide you through the text and help you answer the self-quiz at the end of each lesson.</p> <p><u>Example #1</u> IDENTIFY the type of blast cleaning used to prepare the surface for coatings that must withstand exposure to very corrosive atmospheres.</p> <p><u>Example #2</u> IDENTIFY the power tool used to remove rust, mill scale, and oil paint from large metallic and masonry areas.</p>
Self-quiz Item(s)/Topic Review Item(s)	<p><u>Example #1</u> Which type of blast cleaning should you use to prepare the surface for coatings that must withstand exposure to very corrosive atmospheres?</p> <p><u>Example #2</u> The power tool used to remove rust, mill, scale, and oil paint from large metallic and masonry areas is _____.</p>
Pamphlet Review Quiz	<p><u>Example</u> The paint used as a primer/sealer or finish coat on exterior concrete and masonry is _____.</p> <p>A. Mare Island Epoxy B. Exterior Acrylic Emulsion C. Chlorinated Alkyd Resin Enamel D. Interior/Exterior Gloss Alkyd Resin Enamel</p> <p><u>Note:</u> When designing your review quiz, you are sampling your lesson objectives. You can develop your review quiz items by converting your self-quiz items to multiple-choice format.</p>

Test Item Format

Introduction

In nonresident training, test items are developed for self-quizzes, pamphlet review quizzes, end-of-course tests, and servicewide exams. The test items in the self-quizzes are formatted to directly correspond to the lesson objectives. Test items for the other three tests are written in the four-response, multiple-choice format.

Test Item Types

The four basic types of test items you will use are:

- Short answer
- Matching
- Multiple choice
- Performance

True/false test items and items requiring the student to circle information are not to be used.

Table

The following table identifies which test item format you may use on the tests you develop.

Test	Test Item Format
Self-Quiz/Topic Review	Short answer Matching Multiple choice Performance
Pamphlet Review Quiz	Multiple choice
EOCT	Multiple choice
SWE	Multiple choice

Test Item Format

Characteristics The characteristics for each type of test item are shown below.

Test Item Type	Characteristics
Short Answer	<ul style="list-style-type: none"> • Requires brief response. • Used to test simple recall. • Requires student to supply answer.
Matching	<ul style="list-style-type: none"> • Requires student to select a response. • Tests student's ability to identify or recognize objects, words, or ideas.
Multiple Choice	<ul style="list-style-type: none"> • Requires student to select a response. • Tests student's ability to identify or recognize objects, words, or ideas. • Tests student's ability to apply concepts, principles, procedures, or processes.
Performance	<ul style="list-style-type: none"> • May be written as short answer, multiple choice, or performance. • Requires student to apply rules or procedures in writing or by performing. • Tests student's ability to problem solve a situation/product requiring use of several rules.

Test Item Format

Short-Answer Construction

Short-answer items include completion, list, and explanation. Use short-answer items when you want the student to recall facts, basic ideas, or principles, or to make simple applications. Short-answer items are constructed based on the following guidelines:

- Completion Items. Completion items can be used for who, what, when, where, and why type of verbal association. They eliminate guess work and save time. Some guidelines for writing completion items are:
 - ⇒ Give the student all of the required information that will lead to the correct response before the blank.
 - ⇒ Make sure there is only one correct answer.
 - ⇒ Place the blank at or near the end of the statement.

Example:

In an internal combustion engine, the straight-line motion of the pistons is converted into the circular motion of the drive shaft by the _____.

- List Items. List items require the student to write out the answers. Answers for list items should:
 - ⇒ Be brief responses (a few words or phrases).
 - ⇒ Require no more than six to eight items to be listed.

Example:

List the three equations derived from Ohm's Law.

- 1.
- 2.
- 3.

Note: You may use a., b., c., etc., in place of numbers.

Test Item Format

Short-Answer Construction (Continued)

- Explanation Items. Explanation items relate very closely to completion items. The length of the required response is the obvious difference, but explanation items can be made more demanding. The student is required to furnish a response and to spell it out. Good explanation items demand the student's best thinking. Some guidelines for writing explanation items are:

⇒ Make sure the student understands what kind of discussion you want.

⇒ Limit answers to only a few phrases or sentences.

Example:

What is the primary purpose of each of the following blocks in the transmitter?

Modulator _____

Microphone _____

Antenna _____

Oscillator _____

- Short-Answer Item Using Illustrations. Graphic items can present the "given" element in a figure and require a graphic or essay response, or a combination of both, or they can present the "given" element verbally and require a graphic response. Many technical courses combine the graphic and problem items effectively. With some minor changes, these simple quiz items can become more complex multiple-choice items for use on the EOCT.
-

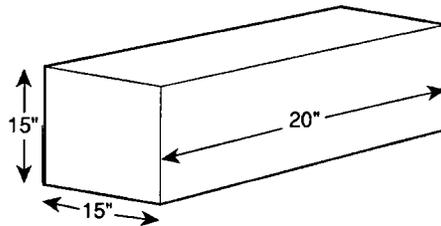
Test Item Format

Short-Answer Construction (Continued)

The next two examples show short-answer items using graphics.

Example #1:

Study the diagram below and write your answer to each question in the appropriate blank.

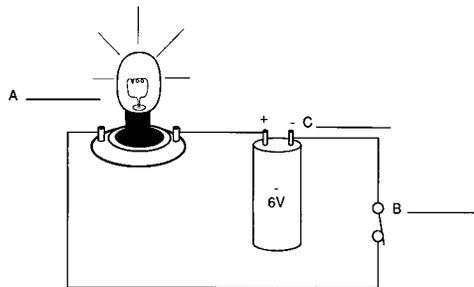


_____ 1. What is the horizontal distance?

_____ 2. What is the volume?

Example #2:

Using the diagram below of a simple electrical circuit, label each component shown.



Test Item Format

Short-Answer Construction (Continued)

- Short-Answer Item Requiring Application of Knowledge.

Example:

The S. G. governor was just put on the engine.
The governor drain has always worked properly in the past but now the governor is overflowing.

What is the MOST probable cause of the problem?

What corrective action should you take?

Matching Construction

Properly constructed matching items can make the student reflect, discriminate, interpret, organize, and classify. You should also build your matching items around a related body of facts or ideas. Construct matching items based on the following guidelines:

- Write directions to include:
 - ⇒ Content of each column.
 - ⇒ How many times the answer entries may be used.
 - List nothing in either column that is not relevant to the subject; do not include out-of-place entries.
 - Include more entries in the answer column than in the question column.
 - Place the column containing the longer entries on the right side of the page.
 - Arrange entries in logical order (e.g., alphabetically, chronologically).
-

Test Item Format

**Matching
Construction
(Continued)**

Example #1:

Match the electrical symbols in column B with the appropriate name of the symbol listed in column A. Use each symbol only once.

Column A

- _____ 1. Antenna
- _____ 2. Battery
- _____ 3. Fuse
- _____ 4. Inductance
- _____ 5. Resistance
- _____ 6. S P Switch

Column B

- a. 
- b. 
- c. 
- d. 
- e. 
- f. 
- g. 
- h. 

(Question Column)

(Answer Column)

Example #2:

Match each transmitter component listed in column A with its purpose from column B. Use each letter only once.

Column A

- _____ 1. Modulator
- _____ 2. Microphone
- _____ 3. Antenna

Column B

- a. Assigns RF carrier wave.
- b. Impresses intelligence on RF carrier wave.
- c. Amplifies RF signal.
- d. Radiates energy into space.
- e. Converts sound to electrical energy.

Test Item Format

Matching Construction (Continued)

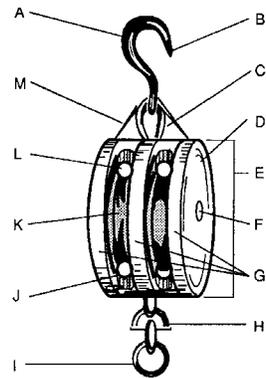
Example #3:

Using the diagram of the snatch hook shown in column B, match each of the components listed in column A to its appropriate location on the diagram. Each letter may be used only once.

Column A

- _____ 1. Becket
 _____ 2. Breech
 _____ 3. Check
 _____ 4. Face
 _____ 5. Hook
 _____ 6. Pin
 _____ 7. Sheave
 _____ 8. Shell
 _____ 9. Swallow
 _____ 10. Thimble

Column B



Multiple-Choice Construction

Multiple-choice test items must comply with the section on test item-writing principles in this manual. Construct multiple-choice items based on the following guidelines:

- Provide one correct answer and three distractors.
 - Use distractors that are plausible.
 - Place blank at or near the end of the question.
 - Make the blank five underlines (i.e., _____).
 - Arrange numeric distractors either in ascending or descending order.
 - Arrange distractors by length if using multiple-line distractors.
 - Make the alternatives as nearly equal in length as possible.
 - Ensure there is only ONE correct answer.
 - Ensure the stem is free of irrelevant material.
-

Test Item Format

Multiple-Choice Construction (Continued)

When you are constructing multiple-choice test items, AVOID the following:

- Wording that serves as clues (i.e., "a" or "an" before the blank)
- Changes in parts of speech.
- Mixing singular and plural.
- Using "none of the above" or "all of the above."
- Repetition in wording of responses.

The multiple-choice test item format can be constructed using one or a combination of the following types:

- Recognition Item. Use a direct question or incomplete statement to determine the student's ability to recognize facts, concepts, procedures, processes, and principles.

Example #1:

Which is the correct formula for Ohm's law?

- A. $R = I/E$
- B. $I = ER$
- C. $E = R/I$
- D. $I = E/R$

Example #2:

The formula for Ohm's law is _____.

- A. $R = I/E$
 - B. $I = ER$
 - C. $E = R/I$
 - D. $I = E/R$
-

Test Item Format

Multiple-Choice Construction (Continued)

- Situation Item. Present the information on which the test item is based in the form of an actual or hypothetical set of circumstances. Items of this type can be simple or complex and can be used for one or more problems. Situation items are extremely useful in testing the student's ability to apply information from the text.

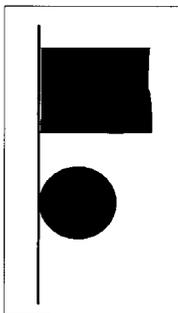
Example:

After working outside in sub-zero temperatures, your hands are beginning to feel stiff and numb. You notice that the skin on your hands is very white. How should you treat your hands?

- A. Warm your hands with a heat lamp
 - B. Immerse your hands in warm water
 - C. Place your hands over a hot stove or fire
 - D. Rub your hands together until the feeling returns
- Item Using an Illustration. An illustration is the "given" element used with any of the previous types of multiple-choice test items.

Example:

The signal shown below indicates _____.



- A. diving operations
 - B. survey operations
 - C. a vessel in distress
 - D. an unknown medical emergency
-

Test Item Format

Performance Construction

Performance items are functional. To solve them, the student must understand principles and be able to apply them. Math problems, in particular, force the student to perform operations accurately and in a definite sequence. Most math problems, other than those limited to simple arithmetic, fall in the category of formula and equation problems. You need to specify what operations the student must perform, give the necessary data to work the problem, and ask the student to solve for the unknown value(s). The formula sets up the broad outline of the problem.

Construct performance test items based on the following rules:

- Use the rules for the test item format that you choose. Provide clear, complete directions.
- Identify criteria for test items requiring response within given parameters.
- Make sure the explanation portion of each test item contains only a few short phrases or sentences in order to minimize confusion.

Example #1:

Using the formula for solving time, speed, and distance problems, solve for the unknown values.

TIME	SPEED	DISTANCE
a. _____	14 kts	147 NM
b. 12 min	_____	.6 NM
c. 73.5 hrs	16 kts	_____

Example #2:

Your ship is on course 320°T, speed 15 knots. Your radar operator is tracking contact "K" on course 080°T, speed 8 knots. At time 1412, the contact bears 300°T, 18,000 yards from your unit. You are ordered to alter course in 6 minutes that will bring contact "K" no closer than 3 miles. What is the avoidance course?

- A. 355°T
- B. 350°T
- C. 180°T
- D. 175°T

Test Item Format

Performance Construction (Continued)

Example #3:

During lite-offs, the ECU does not respond to normal power and indicates the alternate source of power. After troubleshooting, you find the trouble to be in the power converter. The connection from fuse F1 to TB1 is loose due to vibration. You should _____.

- A. replace fuse F1
- B. replace the power converter
- C. retighten shock mounts
- D. retighten loose connection

Example #4:

Upon completion of the operational check of the VHF-FM, the following indicators were observed:

1. VHF-FM has proper transmit and receive capability in all modes.
2. VHF-FM will properly tune to selected frequencies.
3. When activating CCO toggle switch to control squelch, no change in operation is noted.

Does a malfunction exist?

If no, stop.

If yes, answer 1 and 2.

1. What indication leads to this conclusion?

2. List all probable causes.

Test Item-Writing Principles

Stem Format

The format of the stem of a test item is developed using one of the following formats:

- Declarative Format. In the declarative stem, ask for only one piece of information. Use one blank to represent the missing information. Make the blank five underlines for multiple-choice questions (but blank may be longer on self-quizzes for fill-in the blank test items). Place the blank as near the end of the sentence as possible to avoid confusion and necessitate excessive rereading of the stem.

Examples:

Poor: The _____ must be used when aligning _____ bearings.

Better: When aligning shaft bearings, you must use a _____.

Poor: The _____ mixes fuel and air in a gasoline engine.

Better: In a gasoline engine, the fuel and air are mixed by the _____.

- Interrogative Format. Ask only one question, and begin the main clause with an interrogative word (e.g., who, which, what, how, when, why).

Examples:

Poor: What is the primary color and rated capacity of a CO₂ cylinder?

Better: What is the primary color of a CO₂ cylinder

Principles for Writing the Stem

The principles for writing the stem for a test item are provided below.

- Completeness. Write the stem so that its meaning is immediately clear without reading the responses. Include as much information as possible in the stem so that the alternatives are brief and nonrepetitive and lead to a single, correct answer listed in the response.
-

Test Item-Writing Principles

Principles for Writing the Stem (Continued)

Examples:

Poor: When lube oil leaves an engine sump, what does it do?

Better: When lube oil leaves an engine sump, it FIRST passes through a _____.

Poor: A blower or supercharger _____.

Better: A blower or supercharger is installed on some diesel engines to increase _____.

- Extraneous Information. Leave out all unnecessary information.

Examples:

Poor: Coast Guard Regulations provide that a leading petty officer must be detailed as master-at-arms. A senior petty officer is assigned this duty by the _____.

Better: Who assigns the master-at-arms duty to a senior petty officer?

- Exclusive Information. Include information in the stem which will set limits for the correct response (for example, first, maximum, minimum, least).

Examples:

Poor: The Mk 58 marine location marker will burn for _____ minutes.

Better: The Mk 58 marine location marker will burn for a MAXIMUM of _____ minutes.

Test Item-Writing Principles

Principles for Writing the Stem (Continued)

- Qualifying Information. Place qualifying information in the first part of the stem as a phrase, dependent clause, or a separate sentence. Eliminate qualifying information and modifiers that are vague or ambiguous.

Examples:

Poor: What should you do FIRST after you remove a potentially dangerous prisoner from a crowded building?

Better: After you remove a potentially dangerous prisoner from a crowded building, what should you do FIRST?

- Positive Items. Write positive test items, unless the negative form is more appropriate for safety, critical decision, or exception items.

Examples:

Poor: Which function is not a function of lube oil?

Better: The four MAIN functions of lube oil are to lubricate, clean, seal, and _____.

Safety: While using a welding torch, you should NEVER wear which material?

Critical Decision: When marking the parts of a gas turbine engine, you should NEVER use _____.

Exception: The copies of PMIS documents are distributed as indicated on each copy EXCEPT when directed otherwise by _____.

- Comparisons. Do not omit words needed to complete comparisons.

Examples:

Poor: One advantage of channel-lock pliers is that they _____.

Better: One advantage of channel-lock pliers over waterpump pliers is that channel-lock pliers _____.

Test Item-Writing Principles

Principles for Writing the Response

The principles for writing the responses to test items are provided below:

- Plausibility. All distractors must be plausible (logical).

Examples:

Poor:

- A. Commandant
- B. District commander
- C. Commanding officer
- D. Mayor

Better:

- A. Commandant
- B. MLC commander
- C. District commander
- D. Commanding officer

- Distinct Choices. Provide clear and distinct choices.

Examples: The front of the ship is referred to as the _____.

Poor:

- A. bow
- B. bough
- C. brow
- D. beam

Better:

- A. bow
- B. stern
- C. port
- D. starboard

- Parallelism. All responses must be parallel in grammar, form, and intent.

⇒ Grammar Examples:

Poor: The MAIN purpose for including crewmembers in a search briefing is _____.

- A. to improve morale
- B. improving lookout performance
- C. to clarify duties
- D. clarify departure time

Better: The MAIN purpose for including crewmembers in a search briefing is to _____.

- A. improve morale
- B. improve lookout performance
- C. clarify objectives
- D. clarify the departure time

Test Item-Writing Principles

Principles for Writing the Response (Continued)

⇒ Form (length) Examples:

Poor:

- A. In the chest
- B. In the kidney
- C. In the sella turcica of the sphenoid bone
- D. Under the arm

Better:

- A. In the chest
- B. In the kidney
- C. Near the brain
- D. Under the arm

⇒ Intent (primary point) Examples:

Poor: Which of the following statements concerning Servicemen's Group Life Insurance is correct?

- A. Married members who have never filed a beneficiary designation must do so to protect beneficiaries
- B. Reserve members on 2 weeks' active duty for training are automatically covered under SGLI unless they request otherwise
- C. Members canceling their coverage under SGLI must provide evidence of good health before being reinstated
- D. Claims for death benefits under SGLI will be paid by the Veterans' Administration

Better: To qualify for Servicemen's Group Life Insurance, Reservists must be on active duty for AT LEAST _____ days.

- A. 2
 - B. 14
 - C. 30
 - D. 60
-

Test Item-Writing Principles

Principles for Writing the Response (Continued)

- Extraneous Information. Leave out unnecessary information. Eliminate complex lists and sequence of steps.

Examples:

Poor: This refrigerant absorbs heat in the _____.

- A. evaporator in an R-12 system
- B. condenser in a boiler
- C. compressor in an R-12 system
- D. compressor in a turbine

Better: In an R-12 refrigeration system, the refrigerant absorbs heat in the _____.

- A. cooler
- B. condense r
- C. evaporator
- D. compressor

- Redundant Phrasing Responses. Omit all redundant phrasing.

Examples: Responsibility for a ship rests with the _____.

Poor:

- A. CO
- B. commanding officer
- C. "old man"
- D. senior officer

Better:

- A. commanding officer
- B. executive officer
- C. navigation officer
- D. engineer officer

- Overlapping Responses. Omit all overlapping ranges.

Examples:

Poor:

- A. 12 to 16
- B. 14 to 20
- C. 16 to 18
- D. 19 to 22

Better:

- A. 12 to 15
 - B. 16 to 19
 - C. 20 to 24
 - D. 25 to 29
-

Test Item-Writing Principles

Principles for Writing the Response (Continued)

- Order of Responses. Arrange responses in logical order.
 - ⇒ Group common elements together.
 - ⇒ Use response D to indicate a negative response, such as "Never." The use of "None of the above" or "All of the above" is discouraged.
 - ⇒ Arrange numerical responses or chain of command positions/places in ascending or descending order.
 - ⇒ Arrange distractors by length if using multiple-line distractors.

Examples:

Poor:

- A. 157.05 MHz
- B. 2182 kHz
- C. 157.1 MHz
- D. 2670 kHz

Better:

- A. 157.05 MHz
- B. 157.1 MHz
- C. 2182 kHz
- D. 2760 kHz

- Double Lists. Do not use double lists.

Examples:

Poor: The brake linings of a segmented rotor brake are attached to which of the following?

- | | |
|---------------------------|----------------|
| 1. Rotor segment | A. 1 and 5 |
| 2. Stator plate | B. 2 and 4 |
| 3. Backing plate | C. 1, 3, and 4 |
| 4. Pressure plate | D. 2, 3, and 5 |
| 5. Auxiliary stator plate | |

Better: The brake linings of a segmented rotor brake are attached to the _____ plate.

- A. keeper
 - B. pressure
 - C. stator
 - D. backing
-

Test Item-Writing Principles

Style and Punctuation

The principles for style and punctuation used in writing test items are provided below.

- Final Punctuation. Do not use a period after the last word in each response.

Example:

- A. Seal the compartment
- B. Secure the pump
- C. Add an educator
- D. Add a second pump

- Quotation Marks. Use quotation marks to set off commands and examples of word use.

Examples:

1. To acknowledge the receipt of a message on a sound-powered telephone, you should say "_____."

- A. AFFIRMATIVE
- B. AYE, AYE
- C. ROGER
- D. ON THE LINES

2. What does the abbreviation "psi" represent?

- Abbreviations. Use only standard, widely accepted abbreviations. See Chapter 9 of the Government Printing Office Style Manual.

Examples:

CO, commanding officer
kW, kilowatt
lat., latitude
Loran, long-range navigation
NOAA, National Oceanic and Atmospheric Administration

Test Item-Writing Principles

Style and Punctuation (Continued)

- Capitalization in Responses. Capitalize the first letter of each response to a stem that asks a question.

Example: After crash landing, what should you do FIRST?

- A. Check the injuries
- B. Determine your position
- C. Set-up a temporary shelter
- D. Operate the emergency radio

Exception: Which symbol represents the engineering division at a district office?

- A. e
- B. ene
- C. E
- D. ENE

- Capitalization of Titles. Capitalize titles only if they are used as part of a person's name and immediately precede or follow that person's name. Exceptions in the Coast Guard chain of command are the Commandant, the Secretary of Homeland Security, and the President.

Example: On a Coast Guard vessel, the person responsible for the deck force is the _____.

- A. first lieutenant
- B. engineer officer
- C. operations officer
- D. communications officer

Other Correct Examples:

J. A. DOE, Captain, U.S. Coast Guard
Captain J. A. DOE was also . . .
called J. A. DOE, the captain of the vessel, . . .
when speaking with the Commandant . . .

Test Item-Writing Principles

Style and Punctuation (Continued)

- **Data.** Use "table form" to present four or more pieces of information in the stem.

Example: Using the following information, compute the total days' leave a member would use if hospitalized while on leave.

1639	29 June	Departed on leave
1700	3 July	Admitted to hospital (CO notified)
1000	11 July	Released to resume leave
0800	18 July	Readmitted to hospital for evaluation
1600	22 July	Released to resume leave
0900	4 Aug	Returned to unit

- **Repetitive Phrasing.** If the same word or phrase is used in all four responses, move it to the stem. However, do not separate numeric responses from symbols and abbreviations.

Examples:

Poor: When making an ordinary eye splice in fiber line, you should take a MINIMUM of _____.

- two rounds of tucks
- three rounds of tucks
- four rounds of tucks
- five rounds of tucks

Better: When making an ordinary eye splice in fiber line, you should take a MINIMUM of _____ rounds of tucks.

- two
- three
- four
- five

Exception:

- 500 psi
- 600 psi
- 700 psi
- 800 psi

Test Item-Writing Principles

Style and Punctuation (Continued)

- Units of Measure. Convert all responses to the same unit of measure unless the result is an abnormal use of the units.

Examples:

Poor:

- A. 1 day
- B. 15 days
- C. 1 month
- D. 3 months

Better:

- A. 1 day
- B. 15 days
- C. 30 days
- D. 90 days

Exceptions:

- A. 157.05 MHz
- B. 157.1 MHz
- C. 2181 kHz
- D. 2670 kHz

- A. 1 month
- B. 2 months
- C. 1 year
- D. 2 years

- Symbols. Use standard symbols with a number.

Examples:

Poor:

- A. 45 degrees
- B. 60 degrees
- C. 90 degrees
- D. 120 degrees

Better:

- A. 45°
- B. 60°
- C. 90°
- D. 120°

- Publications and Forms. When you use both the name and number of a publication or form, use the name first followed by the number.

⇒ Publications Examples.

Enlisted Qualifications Manual, COMDTINST M1414.8 (series)
Directives System, COMDTINST M5215.6 (series)

⇒ Forms Examples.

Enlisted Service Record (CG-3300)
Statement of Understanding (CG-3301A)

Test Item-Writing Principles

Grammar

Grammar may be defined as a system of rules for the use of language, or as a study of what is preferred and what is to be avoided in effective speech and writing. To be effective, we must achieve clarity of expression. We need to know how to present ideas forcefully, without confusion or unnecessary words, by choosing language suited to our purpose. The principles for grammar are outlined below.

- Active Voice. Use active voice whenever the source of action can be identified. Your stem will have a subject or doer of the action, a verb (the action or task), and an object of that action.

Examples:

Poor: When a transmission is ending and no answer is expected, what proword should be used?

Better: When you are ending a transmission and expect no answer, what proword should you use?

- Passive Voice. Use passive voice if you have a good reason to avoid saying who or what has done the verb's action. This situation may occur when the doer is unknown, unimportant, obvious, or better left unsaid. Write passively also if the receiver of the action is more important than the source of the action.

Examples:

Poor: Aboard ship, everyone calls ammunition stowage spaces "_____."

Better: Aboard ship, ammunition stowage spaces are called _____.

Test Item-Writing Principles

Grammar (Continued)

- Agreement. Make each response grammatically consistent with the stem, i.e., use "a/an" if one or more distractors begins with a vowel.

Examples:

Poor: The commanding officer of a WMEC is normally a _____.

- A. chief petty officer
- B. ensign
- C. lieutenant (junior grade)
- D. commander

Better: The commanding officer of a WMEC is normally a/an _____.

- A. chief petty officer
- B. ensign
- C. lieutenant (junior grade)
- D. commander

- Dangling Modifiers. A dangling modifier is a phrase or clause that is attached either to no word in a sentence or to the wrong word. Avoid dangling modifiers (phrases or clauses).

Examples:

Poor: **Needing to be calibrated**, the watch stander should notify _____.

Better: When the pressure gage needs to be calibrated, the watch stander should notify the _____.

- Present Tense. In most cases, the use of the present tense for the main verb is more appropriate.

Examples:

Poor: What **caused** the plates of a battery to disintegrate more quickly than normal?

Better: What **causes** the plates of a battery to disintegrate more quickly than normal?

Test Item-Writing Principles

Word Use

Five principles on the use of certain words are listed below.

- Concise Wording. Use short, concise words whenever possible.

Examples:

Poor:

- A. investigate the condition of the pistons
- B. investigate the condition of the carburetor
- C. disencumber the intake valves
- D. disencumber the exhaust valve

Better:

- A. check the pistons
- B. check the carburetor
- C. clean the intake valves
- D. clean the exhaust valves

- Slang. Use proper terms rather than slang expressions.

Examples:

Poor: In an R-12 refrigeration system, what admits the R-12 into the **evap**?

Better: In an R-12 refrigeration system, what admits the R-12 into the **evaporator**?

- Should/Must/Would. Use "should" to express a preferred action; use "must" to express a required action; avoid the use of "would."

Examples:

Poor: Where **do** you record the proof-load test date on a Stokes litter?

Better: Where **should** you record the proof-load test date on a Stokes litter?

Poor: Which substance **would** you use to fight a class A fire?

Better: Which substance **should** you use to fight a class A fire?

Test Item-Writing Principles

Word Use (Continued)

- Explicit Words. Use explicit, precise words rather than vague, general, or ambiguous words.

Examples:

Poor: In which publication do you find correspondence information?

Better: What CG publication or directive contains detailed procedures for preparing a rapidraft letter?

- Consistency. Be consistent in spelling.

Example:

harbor/harbour

Rule: Always check any style manual your command may have (e.g. Training Center Yorktown Style Manual), then the GPO Style Manual, and finally, check your dictionary.

Numbers

Six principles on use of numbers in the stem and responses are listed below. You will find more rules for using numbers in the GPO Style Manual.

- Spelling. Use figures for all numbers 10 or above. Spell the numbers zero through nine when they are not units of measure or time.

Examples:

- | | |
|----------|-----------|
| A. One | A. 1 ohm |
| B. Two | B. 2 ohms |
| C. Three | C. 3 ohms |
| D. Four | D. 4 ohms |

If numbers above and below 10 are mixed, use figures for all of them.

- | |
|-------|
| A. 1 |
| B. 10 |
| C. 11 |
| D. 30 |
-

Test Item-Writing Principles

Numbers (Continued)

- Order of Responses. Arrange numeric responses in either ascending or descending order.

Examples:

- | | |
|--------|----------|
| A. 100 | A. 4,000 |
| B. 200 | B. 3,000 |
| C. 300 | C. 2,000 |
| D. 400 | D. 1,000 |

- Fractions. Use figures to write fractions when used with units of measure. Use the following form: whole number, space, numerator, slant, denominator.

Example:

When securing an 8-inch towing hawser, you should use a MINIMUM of 3 ½ turns around the _____.

- Dollar signs. In response sets, align dollar signs when they are used with numbers. Use the comma in a number containing four or more digits.

Examples:

- | | |
|----------|-------------|
| A. \$220 | A. \$ 50 |
| B. \$114 | B. \$ 150 |
| C. \$ 8 | C. \$ 1,000 |
| D. \$ 5 | D. \$ 2,000 |
-

Test Item-Writing Principles

Numbers (Continued)

- Alignment. In response sets, align numbers vertically by the decimal. Use the same number of decimal places in all responses unless common usage dictates otherwise, and precede all decimals with whole numbers. Align the units of measure following the numbers. Align fractions, sets, and ranges to the left.

Examples:

Poor:

- A. 0.2 psi
- B. 0.5 psi
- C. 0.75 psi
- D. 1 psi

Better:

- A. 0.20 psi
- B. 0.50 psi
- C. 0.75 psi
- D. 1.00 psi

Other Correct Examples:

- | | | |
|---------|------------|-----------|
| A. 1 | A. 02-32-1 | A. 79/100 |
| B. 12 | B. 02-32-2 | B. 13/20 |
| C. 144 | C. 1-32-02 | C. 5/11 |
| D. 1728 | D. 2-32-02 | D. 1/2 |

Exception:

- A. 157.05 MHz
- B. 157.1 MHz
- C. 2182 kHz
- D. 2670 kHz

- Starting the Stem. Do not begin a stem with a figure. Spell out the number or rephrase the stem.

Examples:

Poor: 1 international nautical mile equals _____ meters.

Better: One international nautical mile equals _____ meters.

Test Item-Writing Principles

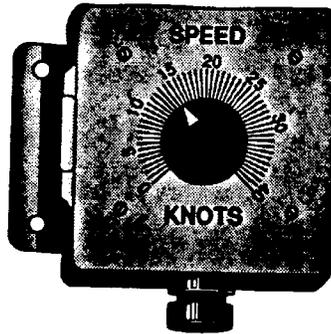
Illustrations

Illustrations should be used whenever an illustration is better than a written description.

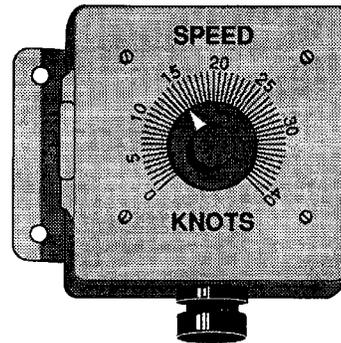
- Quality. Use only line drawings or art designer graphics that have distinct black lines and are completely readable.

Examples:

Poor:



Better:

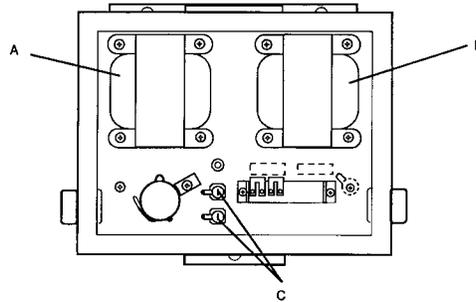


Test Item-Writing Principles

Illustrations (Continued)

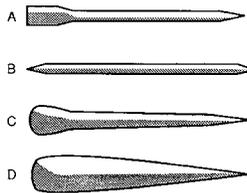
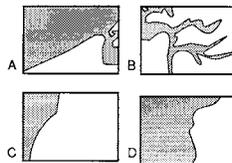
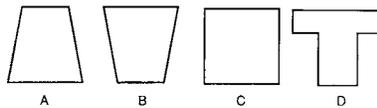
- Single Illustration Lettering. Label parts of a single illustration clockwise starting from the upper left. Use the letters A, B, C, etc.

Example:



- Multiple Illustrations. When each response choice is a separate illustration, arrange and letter the choices left to right, or top to bottom.

Examples:



Test Item-Writing Principles

Illustrations (Continued)

- Location of Illustrations.

If the illustration is used with only one test item, place it between the stem and responses. It must be no wider than one column.

Example:

This illustration shows a/an _____.

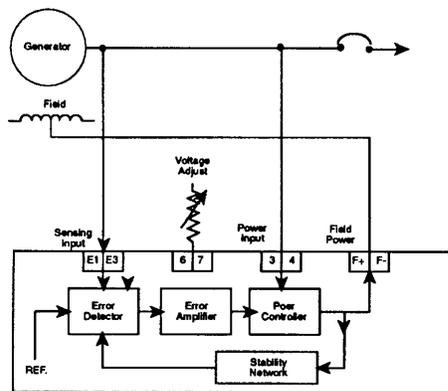


- A. anemometer
- B. psychrometer
- C. barometer
- D. altimeter

- If the illustration is used with two or more test items, place it ahead of the stem of the first item. Illustration width (one or two columns) may vary, depending upon the complexity of the illustration. Provide instructions as in the following example:

Example:

Use the following diagram to answer questions 47 through 49.



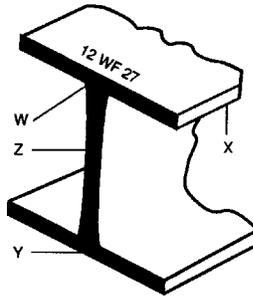
Test Item-Writing Principles

Illustrations (Continued)

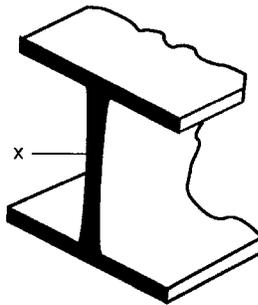
- Extraneous Information. Omit all information and detail not necessary to understand the question and to choose the correct response.

Examples:

Poor: What section of the I-beam does the letter "Z" refer to?



Better: What section of the I-beam does the letter "X" refer to?



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Appendix F

JOB AID FOR GEMINI TEST ITEM DATABASE (TID)

Table of Contents

Topic and Page Location	Overview.....	F-2
	• Introduction	F-2
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	• Call-Outs	F-3
	• TID Task Elements.....	F-4
	• Create a Project	F-4
	• Create a Scene	F-4
	• Import Existing Data	F-4
	• Add/Edit Level of Emphasis	F-4
	• Open a Project	F-4
	• Create Test Items.....	F-4
	• Create a Test.....	F-5
	• Publish a Test	F-5
	• Quick Link to Specific Tasks	F-6
	How To Create a Project.....	F-7
	How To Create a Scene.....	F-9
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	How To Open a Project.....	F-14
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Overview

Introduction

The Gemini Test Item Database (TID) is a Windows application designed for managing Coast Guard test questions used in end-of-course tests (EOCTs) and servicewide exams (SWEs).

Terms

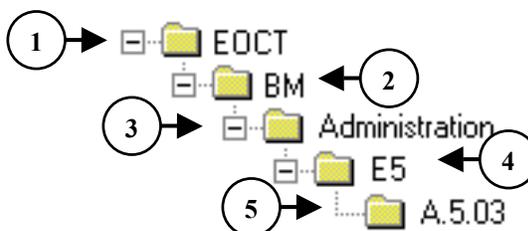
Below is a list of terms and definitions used in this job aid:

Term	Definition
Level of Emphasis	A percentage that determines how many test questions will be selected when automatic test building is used. The total emphasis for paygrades must equal 100%.
Explorer View	Used to locate scenes and add new scenes.
Hierarchy	The classification of a group of scenes. A grade or ranked series of objects.
Item View	Used to modify and make changes to scenes.
Navigate	Using the normal Windows dialogue, hard drive selection, folders selection, file name selection to locate an existing folder/file or to store a new folder/file.
Project	A separate database that resides on a computer hard drive. The project contains all the information about test items and the associated EOCT and SWE tests.
Properties	The attributes of a scene. Qualities that belong to and link all items within a scene.
Properties Sheet	An editable list of all the properties that make up a scene. When you create or edit a scene, you use the scene's property sheet.
Scene	All objects within the TID. Everything within the TID is a scene e.g., a single test question with the distractors, a folder named Administration, a folder named QUAL A.5.03
Test Item	A scene that contains one test question with one correct answer and three distractors.

Overview

Folder Hierarchy

One of the primary concepts within the TID is the hierarchy of scenes. For Windows users, many TID scenes will look like a Windows Explorer view. Once you learn how the hierarchy of scenes (folders) is used within the TID, you can begin to navigate throughout the scenes and manage the TID. Each scene (folder) has a boxed + or – sign to the left. A + indicates there are more scenes within. To expand a scene, click the + sign. Refer to the diagram below and the preceding call-outs explanation table:



Call-Outs

Refer to the call-outs above and the corresponding steps below for the TID hierarchy of scenes:

Call-Out	Explanation
1	Default TID scene (folder) that can contain as many occupational rates as needed.
2	Scene (folder) for a specific occupational rate that represents a storage place for all subjects within the specific occupational rate.
3	Scene (folder) for a specific subject that represents a storage place for specific paygrades of a specific occupational rate.
4	Scene (folder) for a specific paygrade that represents a storage place for all qualification codes within a specific paygrade of a specific subject of a specific occupational rate.
5	Scene (folder) for a specific qualification code that represents storage for all test questions for a specific paygrade within a specific subject within a specific occupational rate.

Overview

TID Task Elements

The TID has eight major tasks for the operator/user.

1. Create a project.
 2. Create a scene.
 3. Import existing data.
 4. Add/Edit level of emphasis.
 5. Open a project.
 6. Create test items.
 7. Create a test.
 8. Publish a test.
-

Create a Project

For a new user, this means that you will be required to create a new project (database) to store your test items. This task is the first step in creating a database of test items that can be used to create course-specific tests.

Create a Scene

This task involves creating new scenes (folders) for various purposes throughout the TID. A scene can be a new occupational rate folder, a new subject folder, a new paygrade folder or even a new test.

Import Existing Data

This task involves importing existing test items from the previous version of the TID into a new project. This procedure eliminates the need to enter existing test items, saving large amounts of time.

Add/Edit Level of Emphasis

This task involves assigning percentages to subjects and paygrades to determine how many test questions will be generated automatically when building a test.

Open a Project

This task involves opening the application and then navigating to an existing project to open and work in.

Overview

Create Test Items

This task involves writing new test items into an existing project. The job aid will also assist you in editing and deleting existing test items.

Create a Test

This task involves the manual and/or automatic selection of the test items that you want to include on a test. Unlike other databases, the TID allows the user to manually select test items and/or automatically build a test based on the user's parameters.

Publish a Test

Once the user has built a test, it must then be published. The TID does this automatically by clicking a few buttons. The TID will produce three documents. All documents are in MS Word format and can be saved, filed, and stored separately. The camera-ready copy will be automatically formatted for the current Coast Guard EOCT and SWE requirements. The three documents are:

- Answer key
 - Review copy
 - Camera ready
-

Overview

Quick Link to Specific Tasks

Use the IF/THEN table below to assist you in locating the correct job aid for the test item database task you wish to accomplish:

IF you need to . . .	THEN go to . . .	On page . . .
create a project	How To Create a Project	7
create a scene	How To Create a Scene	9
import existing data	How To Import Existing Data	11
open a project	How To Open a Project	14
create test items	How To Create Test Items	15
create a test	How To Create a Tests	20
add/edit level of emphasis	How To Add/Edit Level of Emphasis	24
publish a test	How To Publish a Test	30

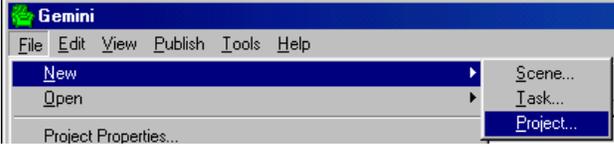
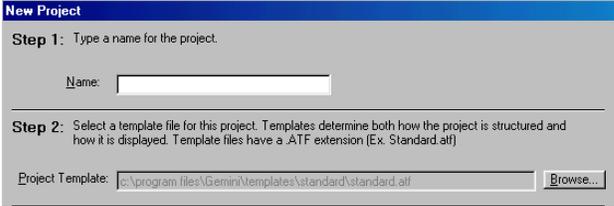
Quick Reference Card

This link will take you to a handy [Gemini Quick Reference Card](#). It is an Adobe PDF six-page document that provides a visual guide with call-outs describing how to accomplish the above tasks.

How To Create a Project

Create a Project Job Aid

Follow the procedures below to create a project:

Step	Action
1	<p>Click <u>F</u>ile, <u>N</u>ew, Project from the File menu.</p> 
2	<p>Enter name of project at step 1 of the New Project dialogue.</p> 
3	<p>Click the Browse button at step 4 of the New Project dialogue. </p>
4	<p>Navigate to your computer's drive and folder you wish to store the new project in.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>If you have not already created a folder, you may do so in this step. This named folder is called the Working Folder and contains all the files associated with the project.</i></p>
5	<p>Enter the name of new project data file. All data files end in .adf</p>
6	<p>Click the Save button.</p>

How To Create a Project

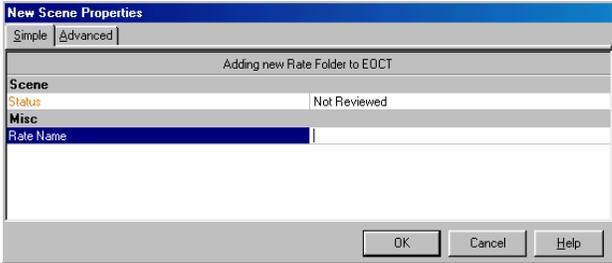
**Create a Project
Job Aid
(Continued)**

Step	Action						
7	<p>Click the OK button below the new Data File window in step 4 of the New Project dialogue.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>By default a new TID has two scenes: EOCT and SWE.</i></p> <table border="1" data-bbox="678 575 1360 856"> <thead> <tr> <th data-bbox="683 575 1062 644">IF you want to . . .</th> <th data-bbox="1062 575 1356 644">THEN go to . . .</th> </tr> </thead> <tbody> <tr> <td data-bbox="683 644 1062 749">create new scene within the EOCT or SWE</td> <td data-bbox="1062 644 1356 749">page F-9</td> </tr> <tr> <td data-bbox="683 749 1062 854">import existing test item information</td> <td data-bbox="1062 749 1356 854">page F-10</td> </tr> </tbody> </table>	IF you want to . . .	THEN go to . . .	create new scene within the EOCT or SWE	page F-9	import existing test item information	page F-10
IF you want to . . .	THEN go to . . .						
create new scene within the EOCT or SWE	page F-9						
import existing test item information	page F-10						

How To Create a Scene

Create a Scene Job Aid

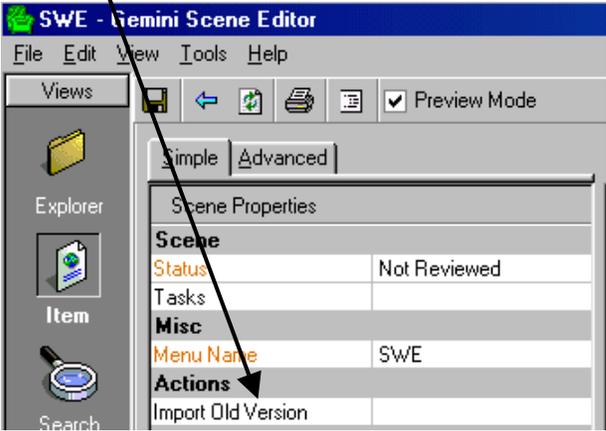
Follow the procedures below to create a new scene within EOCT or SWE scenes:

Step	Action
1	Click the EOCT or SWE icon to highlight.
2	Click <u>F</u> ile, <u>N</u> ew, <u>S</u> cene from the File menu. 
3	Click for an insertion point in the right-hand column next to Rate Name on the New Scenes Properties dialogue. 
4	Enter name of new scene.
5	Click the OK button at the bottom of the New Scenes Properties dialogue. <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>If you need to create other new scenes within the hierarchy of the one above or other scenes, repeat steps 1 - 5. Ensure that you always click to highlight the appropriate higher scene icon.</i></p>

How To Import Existing Data

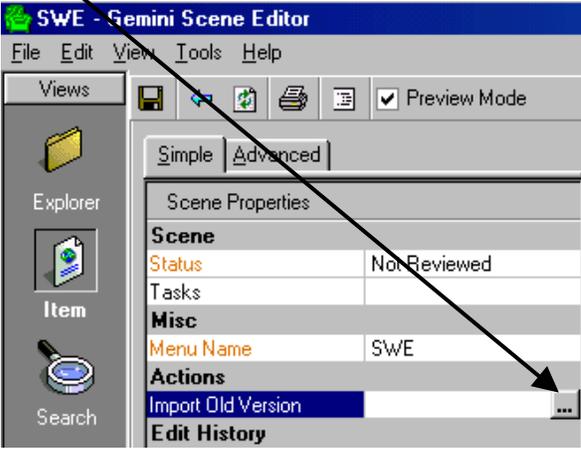
Import Existing Data Job Aid

Follow the procedures below to import existing test item data into a project:

Step	Action
1	Click the EOCT or SWE icon to highlight.
2	Click <u>E</u> dit, <u>S</u> elect Item Properties. 
3	Ensure that the <u>S</u> imple tab is selected on the Scene Properties. If simple view is not in front, click the <u>S</u> imple tab to bring forward. 
4	Click Import Old Version on the Scene Properties dialogue. 

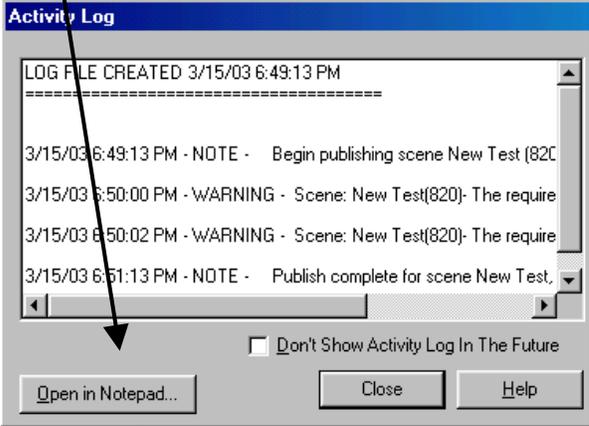
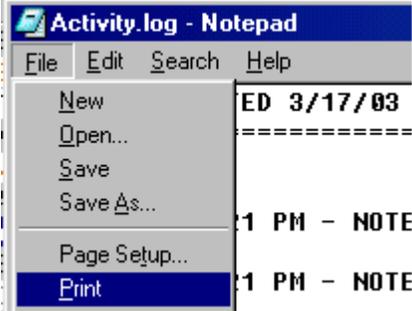
How To Import Existing Data

Import Existing Data Job Aid (Continued)

Step	Action
5	<p>Click  located in the right-hand column next to Import Old Version.</p> 
6	Click the <u>B</u> rowse button.
7	Navigate to locate the existing test item database.
8	Click the database icon to highlight.
9	Click the <u>O</u> pen button.
10	<p>Click the OK button.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>There will be a wait period while the files import. An Activity log will appear once the import is complete.</i></p>

How To Import Existing Data

Import Existing Data Job Aid (Continued)

Step	Action
11	<p>Click the <u>O</u>pen in Notepad button on the activity log screen.</p> 
12	<p>Click <u>F</u>ile, <u>P</u>rint on the Activity log - Notepad File menu.</p>  <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>You must print the activity log now. Once it is closed, it cannot be opened to print at a later time.</i></p>

How To Import Existing Data

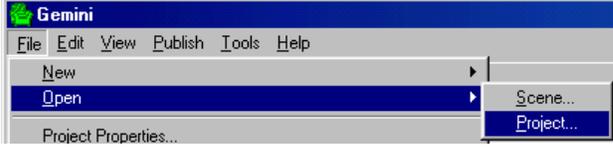
Import Existing Data Job Aid (Continued)

Step	Action
13	<p>Click <u>V</u>iew, <u>R</u>efresh on the File menu.</p>  <p style="text-align: center;">NOTE</p> <p><i>Importing automatically assigns a weight of "B" to all imported test items. The TID automatically sets up the hierarchy of scenes as described on page F-3.</i></p>
14	<p>Follow all instructions on the printed activity log sheet to correct any problems that may have occurred during the import.</p> <p style="text-align: center;">NOTE 1</p> <p><i>Most problems will be with names of scenes or improper test item distracters. If the imported test items had pictures or diagrams, these will NOT be imported</i></p> <p style="text-align: center;">NOTE 2</p> <p><i>The imported test items require a level of emphasis for each subject. Refer to how to add/edit level of emphasis on the next page to add emphasis to each subject.</i></p>

How To Open a Project

Open a Project Job Aid

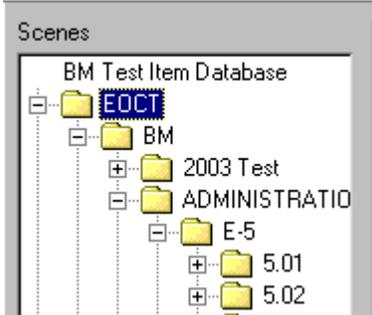
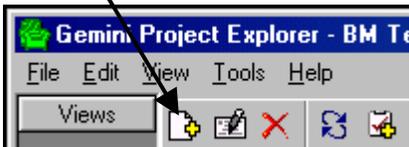
Follow the procedures below to open an existing project:

Step	Action
1	Click <u>F</u> ile, <u>O</u> pen, <u>P</u> roject. 
2	Click the <u>B</u> rowse button.
3	Navigate to your computer's drive and folder to locate the desired project. <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>The TID stores the last four recently opened projects under the File menu. This shortcut can save time by clicking File then clicking on the desired project's name. You can open Two projects at once to copy and paste questions between projects.</i></p>
4	Click project icon to highlight.
5	Click the OK button.

How To Create Test Items

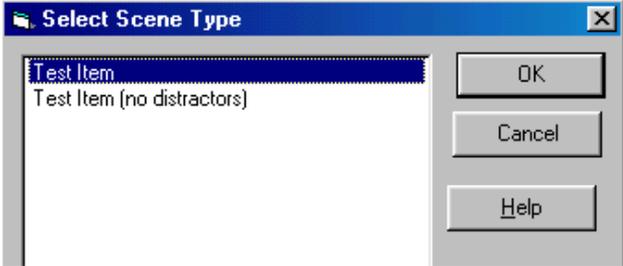
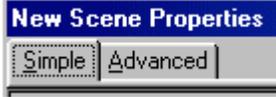
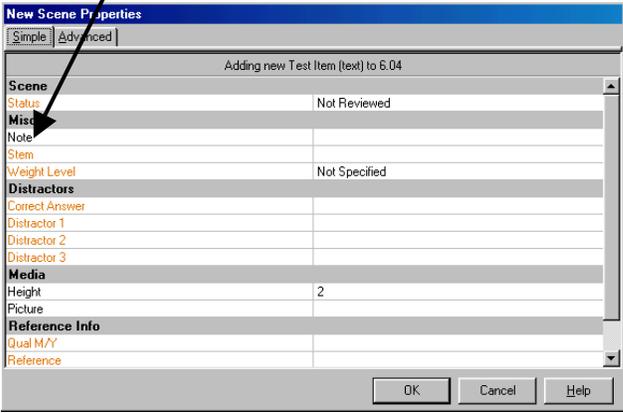
Create Test Items Job Aid

Follow the procedures below to create new test items:

Step	Action
1	<p style="text-align: center;">NOTE</p> <p><i>Test items must be stored within a QUAL Code scene. If the QUAL Code scene has NOT been created, refer to How to create a scene on page F-9 before continuing.</i></p> <p>Click the Explorer icon.</p>
2	<p>Click the necessary  boxes to the left of each scene to expand the hierarchy to show the desired QUAL code scene.</p> 
3	Click the QUAL code icon to highlight.
4	<p>Click  icon to create a new scene.</p> 

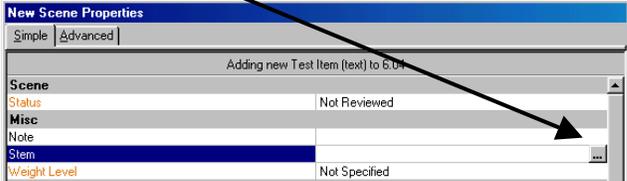
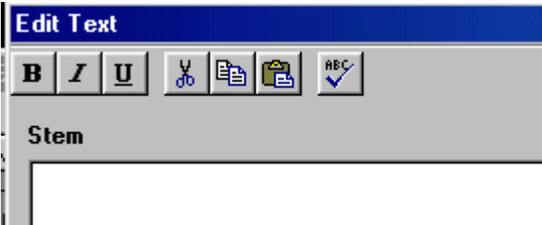
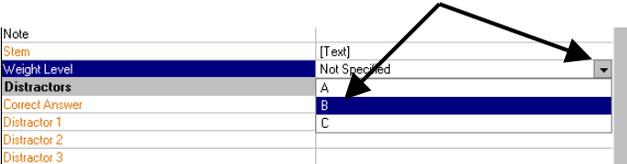
How To Create Test Items

Create Test Items

Step	Action						
5	<p>Click on the type of test item to create:</p>  <table border="1" data-bbox="646 663 1401 911"> <thead> <tr> <th data-bbox="646 663 1024 732">IF test question . . .</th> <th data-bbox="1029 663 1401 732">THEN select . . .</th> </tr> </thead> <tbody> <tr> <td data-bbox="646 739 1024 808">includes four distractors</td> <td data-bbox="1029 739 1401 808">Test Item.</td> </tr> <tr> <td data-bbox="646 814 1024 911">contains a graphic that displays the distractors</td> <td data-bbox="1029 814 1401 911">Test Item (no distractors).</td> </tr> </tbody> </table>	IF test question . . .	THEN select . . .	includes four distractors	Test Item.	contains a graphic that displays the distractors	Test Item (no distractors).
IF test question . . .	THEN select . . .						
includes four distractors	Test Item.						
contains a graphic that displays the distractors	Test Item (no distractors).						
6	Click the OK button.						
7	<p>Ensure that the <u>S</u>imple tab is in front view, if not, click the <u>S</u>imple tab.</p> 						
8	<p>Click <u>S</u>tem on the New Scene Properties dialogue.</p> 						

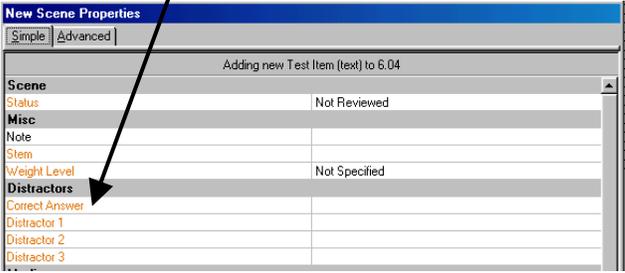
How To Create Test Items

Create Test Items

Step	Action
9	<p>Click  located in the right-hand column next to Stem.</p> 
10	<p>Enter the new test question in the space provided. Format text features are available.</p> 
11	<p>Click the OK button.</p> 
12	<p>Click Not Specified in the right-hand column next to Weight Level. Refer to step 9 above for picture.</p>
13	<p>Click the  to open the drop down menu for weight level. Refer to the picture below.</p>
14	<p>Use the drop down menu to select A, B, or C, and then click on the letter to enter.</p> 

How To Create Test Items

Create Test Items Job Aid (Continued)

Step	Action
15	Click Correct Answer on the New Scene Properties dialogue. 
16	Click  located in the right-hand column next to Correct Answer.
17	Enter the correct answer in the space provided.
18	Click the OK button.
19	Click Distractor 1 on the New Scene Properties dialogue. Refer to the picture above.
20	Click  located in the right-hand column next to Distractor 1.
21	Enter the first distractor in the space provided.
22	Click the OK button.
23	Click Distractor 2 on the New Scene Properties dialogue. Refer to the picture in step 15.
24	Click  located in the right-hand column next to Distractor 2.
25	Enter the second distractor in the space provided.
26	Click the OK button.
27	Click Distractor 3 on the New Scene Properties dialogue. Refer to the picture in step 15.

How To Create Test Items

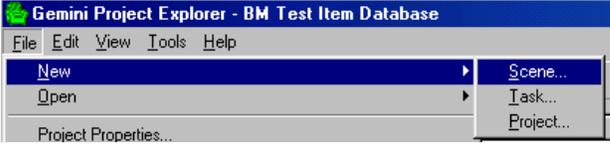
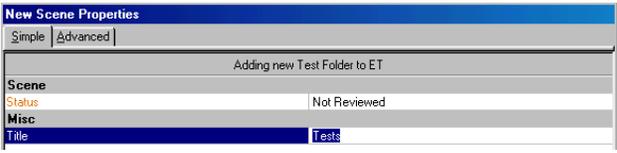
Create Test Items Job Aid (Continued)

Step	Action
28	Click  located in the right-hand column next to Distractor 3.
29	Enter the third distractor in the space provided.
30	Click the OK button.
31	<p>Click inside the right-hand column next to QUAL M/Y on the New Scene Properties dialogue.</p> 
32	Enter the month and year the performance qualification was approved, e.g. 03/03.
33	Click Reference on the New Scene Properties dialogue. Refer to the picture above.
34	Click  located in the right-hand column next to Reference.
35	Enter the reference for the performance qualification, e.g. COMDTINST M2000.3 (series).
36	Click the OK button.
37	Click inside the right-hand column next to Reference Date on the New Scene Properties dialogue. Refer to the picture in step 30.
38	Enter the reference date for the reference, e.g. 03/03.
39	Click the OK button located at the bottom of the New Scenes Properties dialogue

How To Create a Test

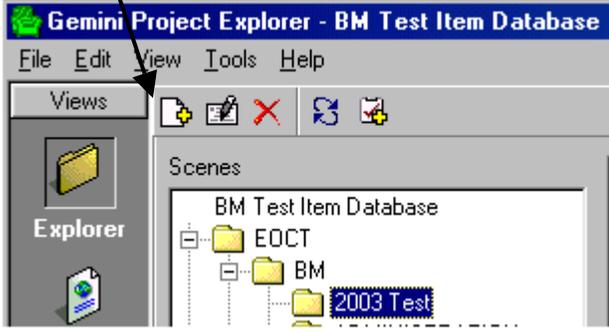
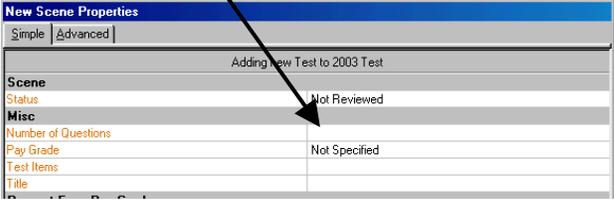
Create a Test Job Aid

Follow the procedures below to create a test:

Step	Action
1	<p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>If a test scene (folder) exists in the hierarchy, begin at step 8.</i></p> <p>Click a rate scene icon to highlight.</p>
2	<p>Click <u>F</u>ile, <u>N</u>ew, <u>S</u>cene from the File menu.</p> 
3	<p>Click on type of scene.</p> 
4	<p>Click the OK button.</p>
5	<p>Click and drag to highlight the default Title name Tests</p> 
6	<p>Enter a name for a new scene that will store the test, e.g., Test 2003.</p>

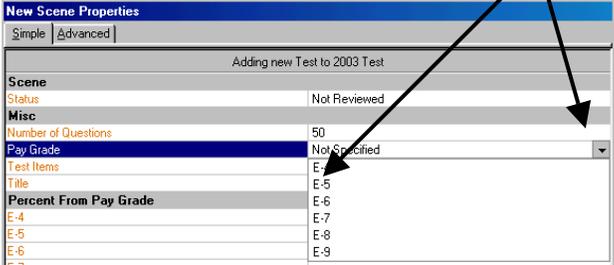
How To Create a Test

Create a Test Job Aid (Continued)

Step	Action
7	<p>Click the OK button.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>The test scene (folder) that has been created can be used to store all future tests. It is not necessary to create a new scene (folder) each time a test is created.</i></p>
8	<p>Click the test scene icon to highlight.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>Your Explore hierarchy view should look something like the example in step 9 below.</i></p>
9	<p>Click  on the icon menu bar below the File menu.</p> 
10	<p>Click in the right-hand column next to “Number of Questions.”</p> 
11	<p>Enter the number of test questions for the test.</p> <p>This defaults to 50.</p>

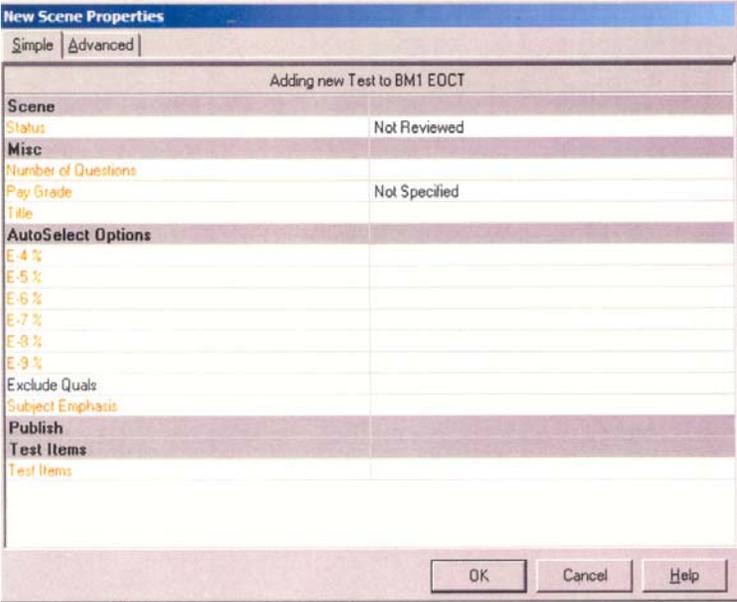
How To Create a Test

Create a Test Job Aid (Continued)

Step	Action
12	Click in the right-hand column next to Pay Grade.
13	Click the  to open the drop down menu for paygrade. Refer to the picture below.
14	<p>Use the drop down menu to select E-5 thru E-9 then click on the paygrade to enter.</p> 
15	Click in the right-hand column next to Title.
16	Enter the name of the test title (this name will appear on the actual test in the header section).

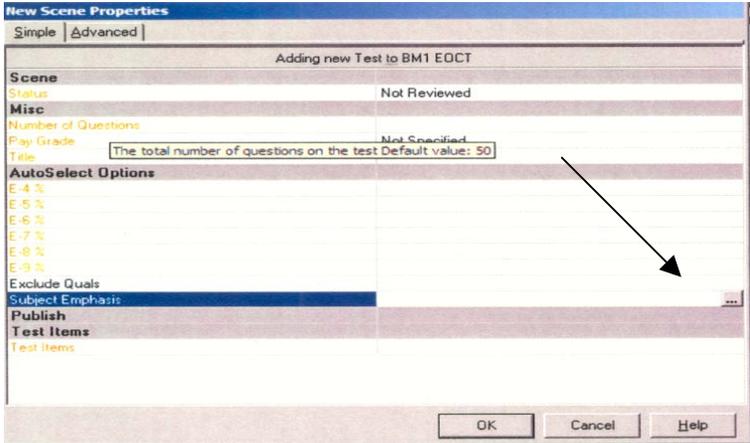
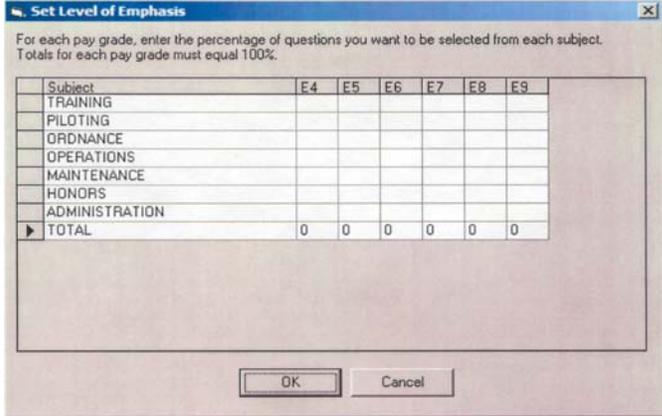
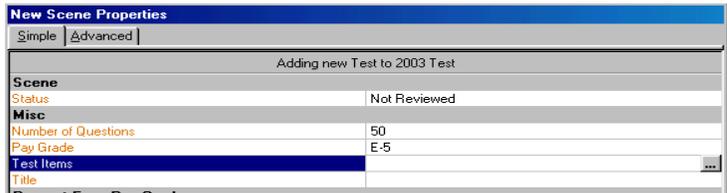
How To Create a Test

Create a Test Job Aid (Continued)

Step	Action
17	<p data-bbox="646 310 1386 491">Enter or change a number to represent the percentages for each paygrade for the AutoSelect option. This step involves entering numbers (representing percentage) for each of the six paygrades. All paygrades must have a minimum of "0".</p>  <p data-bbox="932 1167 1032 1199">NOTE:</p> <p data-bbox="748 1236 1256 1451"><i>To enter numbers for all six paygrades, click in the right-hand column next to a paygrade and enter the number. For EOCT, the test paygrade is 100 and all others are 0. For SWE, set the level of emphasis for each paygrade.</i></p>

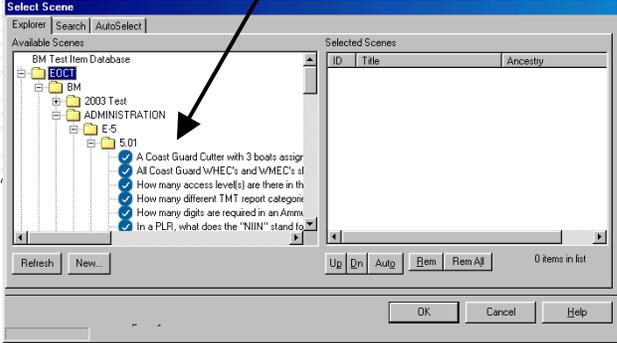
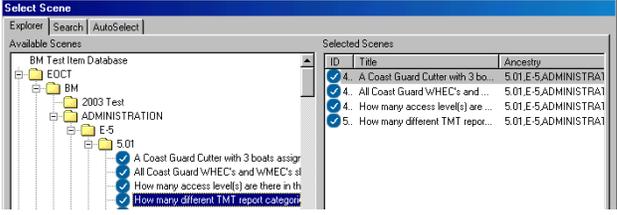
How To Create a Test

Create a Test Job Aid (Continued)

<p>18</p>	<p>To set the level of emphasis for all subjects listed, click on the highlighted button:</p>  <p>Take the total number of subjects and enter numbers (representing percentage) for each subject to equal 100. This must be done for each paygrade. If a paygrade is shown, but not being included for the test, you <u>must</u> enter a 0 (zero).</p> 
<p>19</p>	<p>Click in the right-hand column next to Test Items.</p>
<p>20</p>	<p>Click  located in the right-hand column next to Test Items.</p> 

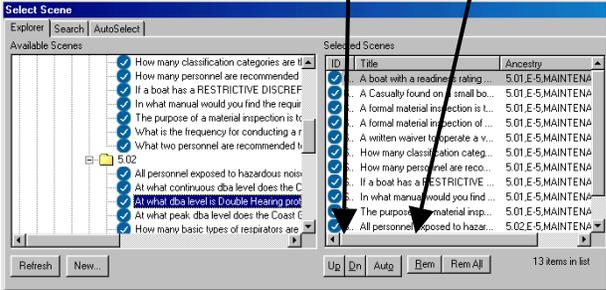
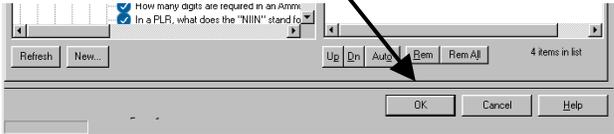
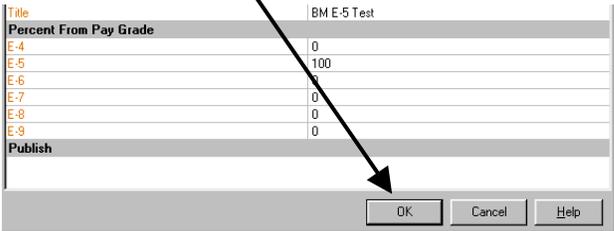
How To Create a Test

Create a Test Job Aid (Continued)

Step	Action						
20 (Cont.)	<p>Decide a method to add test questions:</p> <table border="1" data-bbox="646 365 1401 646"> <thead> <tr> <th data-bbox="646 365 1024 434">IF you want to . . .</th> <th data-bbox="1029 365 1401 434">THEN go to . . .</th> </tr> </thead> <tbody> <tr> <td data-bbox="646 441 1024 541">manually add test questions</td> <td data-bbox="1029 441 1401 541">step 21.</td> </tr> <tr> <td data-bbox="646 548 1024 646">automatically add test questions</td> <td data-bbox="1029 548 1401 646">step 26.</td> </tr> </tbody> </table> <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>If you intend to add any test items manually, you must perform the manual addition first.</i></p>	IF you want to . . .	THEN go to . . .	manually add test questions	step 21.	automatically add test questions	step 26.
IF you want to . . .	THEN go to . . .						
manually add test questions	step 21.						
automatically add test questions	step 26.						
21	<p>Click the necessary  boxes to the left of each scene to expand the hierarchy to show the desired test items</p> 						
22	<p>Double click test items to manually select the test item for the test.</p> 						

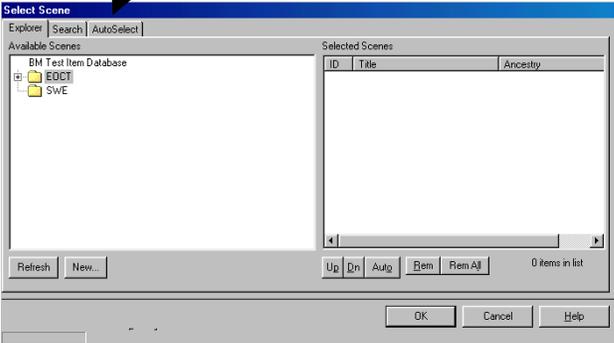
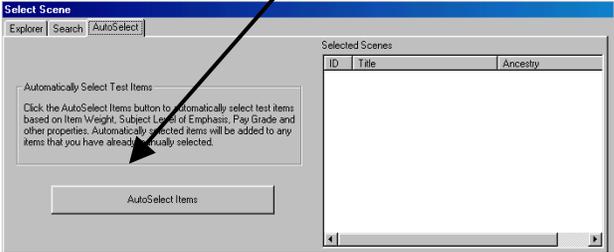
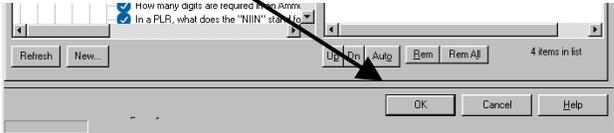
How To Create a Test

Create a Test Job Aid (Continued)

Step	Action
23	<p>Repeat steps 21 and 22 to manually add all test items or the test items you need.</p> <p style="text-align: center;">NOTE 1</p> <p style="text-align: center;"><i>You may at any time stop manually adding test items and allow the TID to automatically add the remainder. Refer to step 26.</i></p> <p style="text-align: center;">NOTE 2</p> <p style="text-align: center;"><i>You can sort test items and remove test items by clicking the Up, Dn, and Rem buttons.</i></p> 
24	<p>Click the OK button.</p> 
25	<p>Click the OK button.</p>  <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>This completes manually creating a test.</i></p>

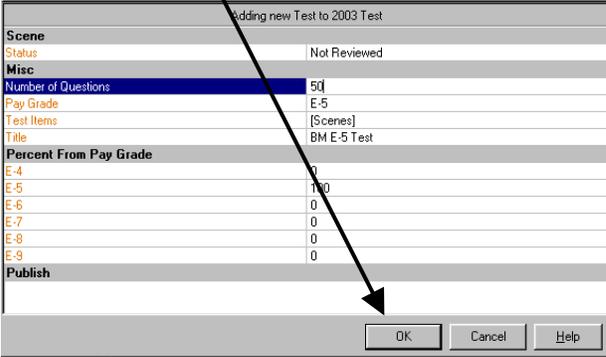
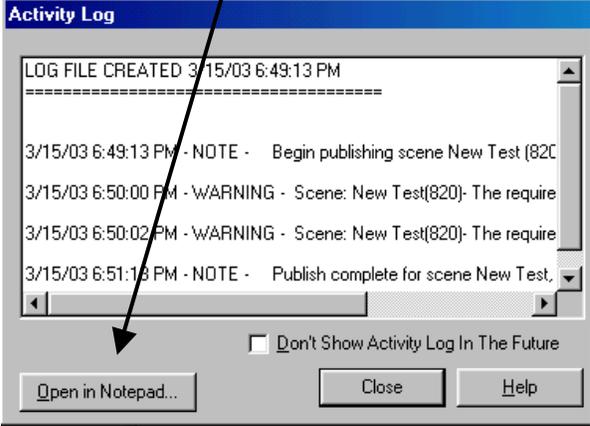
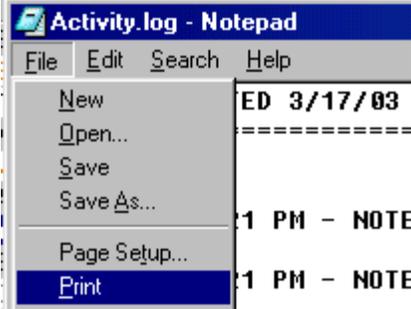
How To Create a Test

Create a Test Job Aid (Continued)

Step	Action
26	<p>Click the AutoSelect tab on the New Scenes Properties dialogue.</p> 
27	<p>Click the AutoSelect Items button.</p>  <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>There will be a wait period while the TID selects your test items based on the level of emphasis.</i></p>
28	<p>Click the OK button.</p> 

How To Create a Test

Create a Test Job Aid (Continued)

Step	Action
29	<p>Click the OK button.</p> 
30	<p>Click the <u>O</u>pen in Notepad button on the activity log screen.</p> 
31	<p>Click <u>F</u>ile, <u>P</u>rint on the Activity log - Notepad File menu.</p> 

How To Create a Test

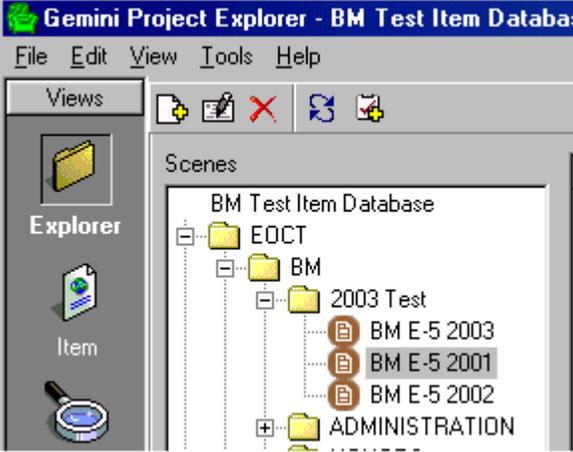
**Create a Test
Job Aid
(Continued)**

Step	Action
32	<p data-bbox="618 317 1354 422">Follow all instructions on the printed activity log sheet to correct any problems that may have occurred during the automatic building of the test.</p> <p data-bbox="967 457 1057 489" style="text-align: center;">NOTE</p> <p data-bbox="727 527 1300 558" style="text-align: center;"><i>This completes automatically building a test.</i></p>

How To Publish a Test

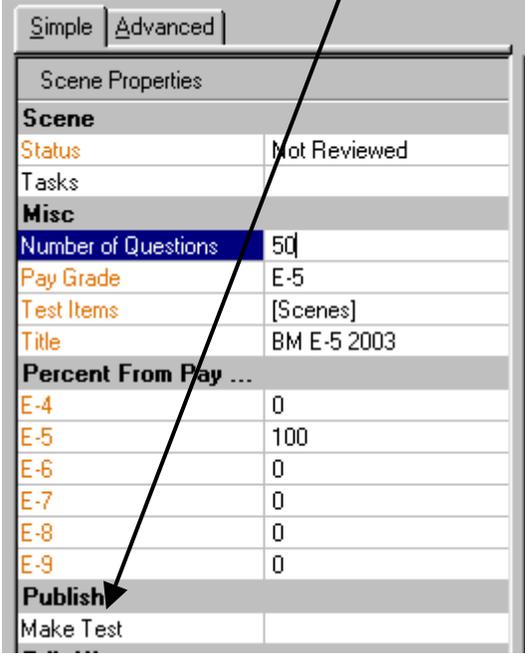
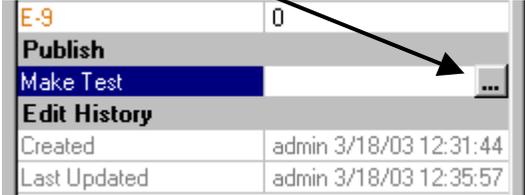
Publish a Test Job Aid

Follow the procedures below to publish a test:

Step	Action
1	<p>Click the Explorer icon to return to the hierarchy of folder scenes.</p> 
2	<p>Click the necessary  boxes to the left of each scene to expand the hierarchy to show the desired test scene.</p> 
3	<p>Click the desired test scene icon to highlight.</p>
4	<p>Click <u>E</u>dit, <u>S</u>electe<u>d</u> Item Properties.</p> 

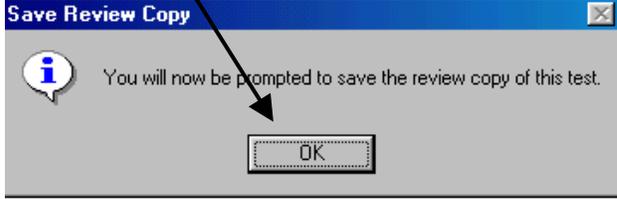
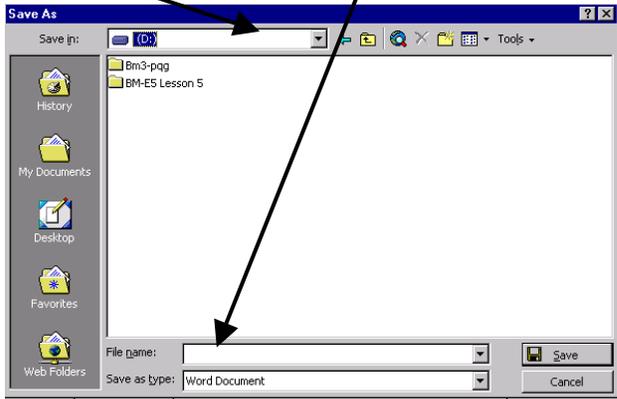
How To Publish a Test

Publish a Test Job Aid (Continued)

Step	Action
5	<p>Click Make Test on the Scene Properties dialogue.</p> 
6	<p>Click  located in the right-hand column next to "Make Test."</p>  <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>The TID will automatically publish three tests in MS Word. There will be a wait period while these tests are being published.</i></p>

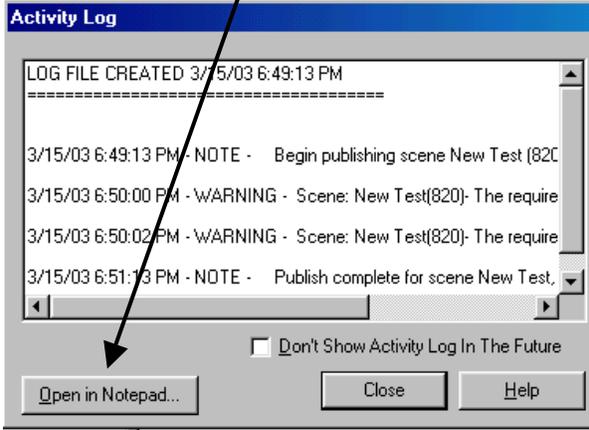
How To Publish a Test

Publish a Test Job Aid (Continued)

Step	Action
7	<p>Click the OK button.</p>  <p>The screenshot shows a dialog box titled "Save Review Copy" with a blue header bar. It contains an information icon and the text "You will now be prompted to save the review copy of this test." Below the text is an "OK" button. An arrow points from the text in the action column to the "OK" button.</p>
8	<p>Enter the name of the review copy and navigate your computer's drive/folders to where you want to save the review copy.</p>  <p>The screenshot shows a "Save As" dialog box with a blue header bar. The "Save in:" field shows drive (D:). The file list shows folders "Bm3-pqg" and "BM-ES Lesson 5". The "File name:" field is empty, and the "Save as type:" is set to "Word Document". There are "Save" and "Cancel" buttons. Two arrows point from the text in the action column to the "Save in:" field and the "File name:" field.</p>
9	<p>Click the Save button.</p>
10	<p>Click the OK button.</p>  <p>The screenshot shows a dialog box titled "READY TO SAVE CAMERA COPY" with a blue header bar. It contains an information icon and the text "You will now be prompted to save the camera-ready version of the test." Below the text is an "OK" button. An arrow points from the text in the action column to the "OK" button.</p>

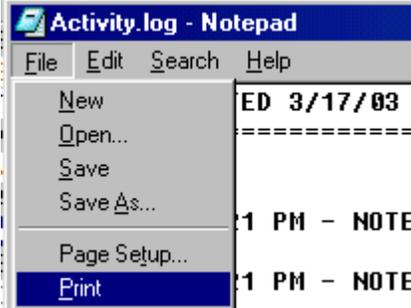
How To Publish a Test

Publish a Test Job Aid (Continued)

Step	Action
11	Enter the name of the review copy and navigate your computer's drive/folders to where you want to save the camera copy.
12	Click the Save button.
13	Click the OK button. 
14	Enter the name of the review copy and navigate your computer's drive/folders to where you want to save the answer key copy.
15	Click the Save button
16	Click <u>F</u> ile, <u>E</u> xit on the MS Word File menu. <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>All three MS Word files have previously been saved.</i></p>
17	Click the <u>O</u> pen in Notepad button on the activity log screen. 

How To Publish a Test

**Publish a Test
Job Aid
(Continued)**

Step	Action
18	<p>Click <u>F</u>ile, <u>P</u>rint on the Activity log - Notepad File menu.</p>  <p>The screenshot shows the 'File' menu of a Notepad window titled 'Activity.log - Notepad'. The menu items are: File, Edit, Search, Help, New, Open..., Save, Save As..., Page Setup..., and Print. The 'Print' option is highlighted in blue. The background of the Notepad window shows a date 'ED 3/17/03' and two lines of text: '1 PM - NOTE' and '1 PM - NOTE'.</p>
19	<p>Follow all instructions on the printed activity log sheet to correct any problems that may have occurred during the publishing of the test.</p>

Appendix G

SECURITY AND COMPROMISE

Security and Compromise

Introduction Everyone involved in the development of end-of-course tests and servicewide exams has the responsibility to safeguard material in order to prevent compromise. Revision of a compromised test is expensive and time-consuming. A compromise could delay promotions, creating a great impact on the enlisted personnel of the Coast Guard. Therefore, general guidelines have been included here to prevent compromise. Detailed instructions can be found in Physical Security and Force Protection Program, [COMDTINST M5530.1 \(series\)](#); Classified Information Management Program Manual, COMDTINST M5510.23 (series); Coast Guard Freedom of Information and Privacy Acts Manual, COMDTINST M5260.3 (series); and Automated Information Systems (AIS) Security Manual, COMDTINST M5500.13 (series).

Testing Material All unclassified testing material is considered sensitive and afforded protection as such. All classified material will be afforded the protections of its classification. Testing material includes camera-ready copies, work sheets and notes, statistical data, and any hard copies of test questions. All elements of computer technology that contain the above listed sensitive material must also be safeguarded.

Definitions The terms dealing with security and compromise of sensitive or classified information are listed in the table below:

Term	Definition
Access	The ability and opportunity to obtain knowledge or possession of classified information. An individual does not have access to classified information merely by being in a place where such information is kept, provided the security measures which are in effect prevent the individual from gaining knowledge or possession of such classified information.
Classified material	Any matter, document, product, or substance on or in which classified information is recorded.
Compromise	The disclosure of sensitive or classified information to persons not authorized access.

Security and Compromise

Definitions (Continued)

Term	Definition
Confidential	The designation which shall be applied to information or material the unauthorized disclosure of which could reasonably be expected to cause damage to the national security.
Controlled area	The least secure type of restricted area. It contains a security interest which if lost, stolen, compromised, or sabotaged would cause identifiable damage to the unit mission or national security. It may also serve as a buffer zone for exclusion and limited areas, thus providing administrative control, safety, and protection against sabotage, disruption, or potentially threatening acts. Uncontrolled movement may or may not permit access to a security interest or asset.
Password	A protected word or string of characters that identifies or authenticates a user for access to a specific resource such as a data set (file) or record.
Physical security	Internal security concerned with the physical measures designed to prevent unauthorized access to equipment, facilities, material, and documents and to safeguard them against espionage, sabotage, damage, theft, or other acts which would in some degree lessen the ability of the command to perform its mission or would affect overall national security interests.
Restricted area	Any area to which access is subject to special restrictions or controls for reasons of security or safeguarding of property or material. This term is a legal designation. Specific administrative terms are used to designate various security areas/levels.
Sensitive material	Material which requires a high degree of protection and control due to regulatory requirements.

Security and Compromise

Personnel Designation

All personnel working with testing material or holding testing material shall be designated in writing by the unit's commanding officer.

Work Site Designation

In order to reduce the risk of compromise, each nonresident work site where testing material and classified course material are produced shall be designated a Restricted Area, in writing, in accordance with COMDTINST M5530.1 (series).

Key and Lock Control System

A key and lock control system shall be established for all Restricted Areas. A key and lock control system supplements other security measures used to control access and is essential for the safeguarding of testing material.

All Restricted Areas shall be equipped with cipher locks. Under no circumstances shall a key to or the combination to any cipher lock be in possession of personnel who do not work in the specified area.

If entrance is required after normal working hours, a staff member must be recalled to open the space. The OOD shall have letters designating staff for recall for entry in each Restricted Area.

Specific guidelines to establish the system are outlined in chapter 2 of the Physical Security and Force Protection Program, COMDTINST M5530.1 (series).

Visitor Control

Visitors to Restricted Areas should be kept to a minimum. If at any time personnel visit workspaces where testing material is being processed, the testing material should immediately be put out-of-sight and the visit terminated until a more opportune time. A Visitor Control Log will be maintained at all nonresident training Restricted Areas.

Approved GSA Container

Testing material must be kept in an authorized GSA-approved security container when the office is vacant or the materials are not being used. Safe combinations and Security Container Check Sheets (SF-702) shall be maintained in accordance with COMDTINST M5510.23 (series). Access to testing material must be limited to authorized persons (those with the proper clearance and with a need to know). This includes testing material for all ratings.

Security and Compromise

Combinations

Combinations to security containers used to store testing material shall only be changed by the custodian. Combinations shall be changed under any of the following circumstances:

- Upon receipt of the container.
- Whenever the custodian is transferred, discharged, or reassigned.
- When the combination or record of the combination has been compromised, or when the security container has been discovered unlocked and unattended.
- At least annually.

Recording Combinations

A Security Container Information Form (SF-700) shall be maintained for each security container used for storing testing material. When selecting combination numbers, DO NOT use:

- Multiples of five or simple ascending or descending arithmetical series.
- Personal data such as birth date or SSN.

The combination shall be recorded on SF-700. The SF-700 shall be entered into the Classified Material Control System and maintained by the Classified Material Control Officer.

Note: Combinations will not be carried in wallets or otherwise on the person or hidden within an office.

Security and Compromise

Container Precautions

The following special precautions shall be followed to ensure that adequate security is being provided for testing material:

- Security containers shall be kept locked when not under the direct observation of the custodian or other authorized persons.
- Reversible "Closed/Open" signs shall be used as additional reminders on security containers.
- A Security Container Check Sheet (SF-702) shall be affixed to each container for the purpose of checking each time the container is opened or closed.
- Only testing material shall be stored in the container. This includes paper and magnetic media copies.
- Testing material not being immediately processed shall be properly stored.

Additional information can be found in chapter 12 of the Classified Information Management Program, COMDTINST M5510.23 (series).

Test Material at the Unit

When testing material is being moved within workspaces or around the unit, the material must be strictly controlled. Each individual must ensure that access is limited to authorized personnel only. The following steps must be taken to safeguard the material:

- A cover sheet must be used when handling testing material within workspaces. For SWEs and EOCTs, the orange SWE and EOCT folders supplied by the Institute may be used, or each training source may design its own. For classified material, the appropriate cover sheet or label shall be affixed to the inner folder. For movement of testing material outside a building, insert the testing material (along with the cover sheet/folder) into another container (a sealed envelope or a briefcase).
 - Turnover of testing material must be from hand to hand. At no time shall testing material be left in an office when persons authorized to receive it are not present.
 - Testing material shall not be viewed, studied, displayed, or worked on except in authorized spaces.
 - Each SME/SMS shall maintain a Testing Material Control Log. (See example at the end of this section.) A locally developed equivalent log may also be used.
-

Security and Compromise

Test Material When Traveling

Hand-carrying test material when you are in a travel status should be kept to an absolute minimum. However, if the situation arises where it cannot be avoided, the following safeguards must be in place:

- Testing material must be kept in the physical possession of the individual at all times unless proper storage at a U.S. Government activity is available.
- Testing material shall not be viewed, studied, displayed, or worked on while in public conveyances or places.
- Individuals responsible for hand-carrying classified testing material in a travel status must be authorized in writing by the commanding officer. A clearance verification letter or message may serve as written authorization. However, one-time authorization letters (courier letters) shall be used for individuals hand-carrying classified testing material in a travel status. These individuals must also be briefed on their duties and responsibilities in accordance with the Classified Information Management Program, COMDTINST M5510.23 (series).

Note: Additional requirements for a courier letter can be found in the Classified Information Management Program, COMDTINST M5510.23 (series).

Packaging

All testing material, whether sensitive or classified, shall be mailed/shipped double-wrapped with the inside envelope containing the following instructions on both sides in at least 1/2-inch letters:

**SENSITIVE MATERIALS TO BE OPENED BY A TESTING
MATERIAL OFFICER ONLY**

The office and person designated to receive testing material shall be identified on the inner envelope only.

Mailing Procedures

When sensitive testing material is mailed between the training source (TS) and CGI or PSC (adv), it must be accounted for by signature using registered mail or FedEx overnight delivery. Classified testing material **MUST** be mailed via registered mail. **DO NOT** use certified mail. A mail logbook shall be used to track testing material that is mailed.

Note: Encrypted transmission of sensitive testing material may soon be an alternative to registered mail or FedEx overnight delivery.

Security and Compromise

Receipt of Testing Material

The testing material officer shall be designated, in writing, by the training source (TS). This person must be a commissioned officer, master chief petty officer, or civilian who shall open all testing material packages received by the TS. CGI and PSC (adv) shall also designate a testing material officer who shall open and distribute registered mail and FedEx packages containing testing material from the TS. In all cases, the registered mail package MUST transit the Command Security Control Point (SCP) prior to being received for by the testing material officer.

Classified testing material shall be handled, mailed/shipped, and disposed of in accordance with the Classified Information Management Program, COMDTINST M5510.23 (series) and Physical Security and Force Protection Program, COMDTINST M5530.1 (series).

Telephone Security

The discussion of sensitive testing material over the telephone shall be avoided. The discussion of classified matters on the telephone is STRICTLY forbidden.

Disposal of Test Development Materials

All work materials, i.e., notes, research papers, drafts, etc., used for development of test items (EOCTs and SWEs) must be disposed of by authorized individuals through shredding or burning in accordance with the Freedom of Information Privacy Acts Manual, COMDTINST M5260.3 (series) and the Classified Information Management Program, COMDTINST M5510.23 (series).

Note: From development to the time of destruction, EOCTs and SWEs must be maintained for a period of 3 years in accordance with the Coast Guard Paperwork Management Manual, COMDTINST M5212.12 (series).

Reproduction of Testing Material

Testing material shall not be reproduced unless approved by either the senior SME for the rating or higher authority. Once reproduced, the new copy shall be accounted for in the Test Material Control Log for the appropriate rating. Personnel reproducing test material shall exercise care to prevent the testing material from being compromised. They shall be aware of and alert to the specific security hazards listed in chapter 7 of Classified Information Management Program, COMDTINST M5510.23 (series).

Security and Compromise

Labeling of Removable Media

All removable media, i.e., diskettes, Jazz/Zip disks, etc., shall be labeled in accordance with the sensitivity or classification of the data stored on them. The following standard forms are to be used:

- Sensitive SF-710
- Confidential SF-708
- Secret SF-707

Note: Standard forms can be ordered through the Coast Guard acquisition system.

Maintaining SWE/EOCT Hard Copies and Magnetic Media Versions for Record Purposes

SWE/EOCT hard copies should be maintained at the unit for a minimum period of 3 years in accordance with the Paperwork Management Manual, COMDTINST M5212.12 (series). Upon this expiration, those hard copies should be properly disposed of in accordance with the above paragraph. In addition, the magnetic media version of the SWEs and EOCTs should be maintained for a minimum of 3 years. Upon expiration of the 3 years, the magnetic media versions can be deleted or archived.

Compromise or Suspected Compromise During Development

Required Actions for a Compromise or Suspected Compromise During the Development Stage. If there is reason to suspect that compromise of testing material has occurred during the development stage, the following actions apply:

1. Send a routine precedence message. A routine precedence message shall be sent as soon as possible after discovery to Commandant (G-CG-86), with the CGI as an info addressee for EOCT compromises and PSC as an info addressee for SWE compromises. Commandant (G-WTT) shall be an info addressee for all suspected compromises of testing material. The message shall identify:
 - The exact testing instrument involved.
 - A brief summary of the circumstances known.
 - A preliminary evaluation as to the probability of compromise (Low, Medium, or High).
-

Security and Compromise

Compromise or Suspected Compromise During Development (Continued)

Note: This notification is necessary to allow sufficient time for planning test replacement strategy and assessing the impact on advancements. If an actual compromise is found to have occurred, the standard for replacement of an end-of-course test is 30 days from the notification of a confirmed compromise. Depending on the timing of a compromise of an SWE, the replacement time could be as little as 14 days.

2. Investigate the incident. The commanding officer of the unit discovering the compromise or suspected compromise shall investigate the incident. If deemed necessary, an informal board of investigation may be convened in accordance with the Military Justice Manual, COMDTINST M5810.1 (series).
 - Intentional compromise of testing instruments may be punishable under NJP/UCMJ provisions as appropriate.
 - Unintentional compromise or procedures that contributed to compromise should be identified and corrective action recommended or taken.
3. Send a routine precedence message of compromise. After a determination has been made as to whether a confirmed compromise did occur, a routine precedence message must be sent to all concerned clearly identifying which testing instruments were actually compromised. Also include any recommendations which would prevent future compromises.

Note: SMSs should maintain file copies of messages and investigative reports together with the compromised tests.

Security and Compromise

Compromise or Suspected Compromise at a Unit Other than a TS

Required Actions for a Compromise or Suspected Compromise at a Unit Other than the TS. If there is probable cause to believe that an actual or suspected compromise of any testing instrument has occurred, the following actions apply:

1. Send a routine precedence message. A routine precedence message shall be sent as soon as possible after discovery to Commandant (G-CG-86), with the CGI as an info addressee to EOCT and PSC as an info addressee for SWE compromises. The TS responsible for development of the testing instrument in question shall also be an info addressee in all cases. Commandant (G-WTT) shall be an info addressee for all suspected compromises of testing material. The message shall identify:
 - The exact testing instrument involved.
 - A brief summary of the circumstances known.
 - A preliminary evaluation as to the probability of compromise (Low, Medium, or High).

Note: This notification is necessary to allow sufficient time for planning test replacement strategy and assessing the impact on advancements. If an actual compromise is found to have occurred, the standard of replacement for an end-of-course test is 30 days from the notification of a confirmed compromise. Depending on the timing of a compromise of an SWE, the replacement time could be as little as 14 days.

2. Investigate the incident. The commanding officer of the unit discovering the compromise or suspected compromise shall investigate the incident. If deemed necessary, an informal board of investigation may be convened in accordance with the Military Justice Manual, COMDTINST M5810.1 (series).
 - Intentional compromise of testing instruments may be punishable under NJP/UCMJ provisions as appropriate.
 - Unintentional compromise or procedures that contributed to compromise should be identified and corrective action recommended or taken.
3. Send a routine precedence message of compromise. After a determination has been made as to whether a confirmed compromise did occur, a routine precedence message must be sent to all concerned clearly identifying which testing instruments were actually compromised. Also include any recommendations which would prevent future compromises.

Note: SMSs should maintain file copies of messages and investigative reports together with the compromised tests.

Security and Compromise

Compromises Involving Classified Material

Compromises involving classified material shall be handled in accordance with the Classified Information Management Program, COMDTINST M5510.23 (series).

Communicating with Field Personnel

When talking to field personnel via telephone, in person, e-mail, or letter, test writers must be constantly aware of what they are saying and what kind of information they are passing. The following shall NOT be discussed:

- Specific questions on EOCTs or SWEs.
 - Specific information on where to find the correct answer.
 - Areas/topics of concentration on SWEs.
 - Specific study areas. Instead, guide them to the performance qualifications and appropriate reference material.
 - Discussion of classified material is STRICTLY FORBIDDEN.
-

Inappropriate Activities

There are some activities that test writers cannot participate in, because in so doing it might cause a perception of favoritism, unfairness, or personal gain. These activities include:

- Organizing, holding, or participating in study sessions for servicewide exams.
 - Working for commercial sources that publish and sell study guides for Coast Guard personnel.
 - Participating in any activity which would give an individual or individuals an unfair or perceived unfair advantage in the participation of EOCTs or SWEs.
-

Upon Transfer

When transferred out of the job or to a new unit, test writers may NOT take any testing material with them and may not participate in any of the activities listed above for the first 2 years following transfer.

Computer Security

Introduction Regardless of the physical security of workspaces, if computer security is lax, a compromise of testing material can occur. Providing adequate and effective protection of all computer system resources, including computer equipment and peripherals, is the responsibility of each test writer and should be a constant concern when generating testing material.

Classification Because testing material is to be handled as sensitive material, most computer systems used by test writers shall be designated as Level II, SWSIII with the MSNT operating system. Some rates include classified material and shall have computer systems designated as Level I, SWSIII with MSNT-OS as a standalone or in offline mode. Level I (Classified) is classified information including Confidential, Secret, Top Secret, and higher. Accreditation is required for this level. Review the ADP Security Manual for information on accreditation.

Computer Configuration Computer systems used to generate testing material must meet the criteria of one of the following:

- Networked system capable of booting offline. Networked computers used to generate testing material must be capable of booting offline. The system must be configured so that the test writer has the capabilities of selecting ON-LINE or OFFLINE. **When offline, the computer shall NOT be capable of accessing any network function.** While working offline, save all information strictly to removable media. There must be a printer connected to the computer and a removable media system installed in the computer. An offline system shall consist only of a keyboard, display, CPU, output device (printer), hard drive, and a removable magnetic media system.
- A stand-alone system shall consist only of a keyboard, display, CPU, output device (printer), hard drive, and a removable magnetic media system.
- Local network. A local network not connected to the standard unit network (test development network).

Note: All computers used to generate testing material must be equipped with removable storage media.

Computer Security

Security Requirements

Any computer used to generate testing material must be password-protected. While being used to work on testing material, the computer must not be connected to the unit network (offline, stand-alone, or test development network only).

Printing must be done on a local printer that is not accessible to anyone other than test developers.

Note: Standalone printers should be procured for test developers.

Testing material that is not being immediately processed shall be stored on removable magnetic media and safeguarded in a security container.

Appendix H

JOB AID FOR DEVELOPING PQG PAMPHLET

Directions

Introduction

The PQG pamphlet was created using the structured-writing template (SWT). The “[Master Copy PQG Pamphlet](#)” sent to you as an e-mail attachment is a Word document (but it should still maintain the SWT keystrokes/buttons).

You will only have to type over the gray areas on the cover through page 8. Beginning on page 10 are four PQG sheets followed by four Monthly Tracking Sheets (MTSs). Additional sheets require copying/pasting as explained in the table below.

Procedure Table

Step	Action
1	From e-mail attachment “Master Copy PQG Pamphlet,” save this Word document to a folder.
2	Open this file “Master Copy PQG Pamphlet” to begin a new PQG pamphlet.
3	Immediately , go to File/Save As . . . and rename file. This file will now become your working file.
4	Minimize the “Master Copy PQG Pamphlet.” (Frequently you will need to copy and paste additional PQG sheets and Monthly Tracking Sheet (MTS) from this master document to your new working file.)
5	In your working file, HIGHLIGHT each gray area and overwrite.
6	<p>Note: Four “blank” PQG sheets are provided. Keep one for copying/pasting or go to the minimized master document for copying/pasting.</p> <p>For additional PQG sheet:</p> <ul style="list-style-type: none"> • Copy from map title to paragraph marker below last line of PDS’s comments and notes. • Insert forced page break (CTRL + ENTER) at end of last completed PQG sheet. • Then paste on new page.

Directions

Procedure Table (Continued)	Step	Action
	7	Repeat step 6 as needed. Note: In the task table, you will need to “renumber” the item columns to begin with “1” when beginning a <u>new</u> PQG sheet. (Highlight all numbers in Item column/Go to Format/Bullets and Numbering . . ./Numbered tab/Customize . . ./click on frame with number only (no period)/Start at: type in 1/OK.)
	8	For any “continued” (too many tasks for one page) PQG sheet: <ul style="list-style-type: none"> • Insert forced page break (CTRL + ENTER). (Place cursor on paragraph marker below the last row to avoid splitting the table on two pages.) • Copy previous map title; paste on new page; and hit ENTER. • Copy original table (column heading row and next two rows) and paste on new page below map title. (TPO and Notes to PDS blocks do not have to be copied.) • Continue numbering rows from previous page’s task table. Note: Do not break in the middle of a row. Insert a forced page break (CTRL + ENTER) between rows.
	9	For additional MTS page: Note: Four “blank” MTS sheets are provided. Keep one for copying/pasting or go to the minimized master document for copying/pasting. <ul style="list-style-type: none"> • Copy from top of page (MONTHLY . . .) to include first paragraph marker below table. • Insert forced page break (CTRL + ENTER) at end of last completed MTS. • Paste and continue typing info on MTS.
	10	Repeat step 9 as needed.
	11	<ul style="list-style-type: none"> • Be sure to include the “Additional Comments” page as <u>last</u> page of MTS. • Add a blank EVEN-numbered page to the pamphlet if the pamphlet should end on an ODD page.

Directions

Table of Contents

The format of the table of contents (page iii) is a suggested format. You may want to develop a more detailed TOC (such as used in TRACEN Petaluma's PQGs).

Footers

Information to be place in footers has not been determined at this time.

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