Navy Reusable Learning Object (RLO)

Content Development Guidelines

Version 1.1
February 21, 2003

Navy Reusable Learning Object (RLO) Content Development Guidelines
Version 1.1

Available at
www.navylearning.com
and
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DISCLAIMER: Content developers should refer to the Policy and Guidelines section of Navy E-Learning for the latest version of this document. This document supercedes version 1.0.

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Navy Reusable Learning Object (RLO) Content Development Guidelines—Version 1.1

Abstract

On October 8, 2002, the Chief of Naval Education and Training, Pensacola, FL MSG R 081538Z OCT 02 announced the Navy's adoption of the Reusable Learning Object (RLO) Model as the cornerstone instructional strategy to develop all future learning materials. The Navy's selection of the RLO Model was based on the model's ability to support the Navy's education, training, and performance technology goals.

The RLO Model can be used to support the development of instructor-led, print-based, and self-paced E-Learning content. However, these guidelines specifically address the content development requirements for self-paced E-Learning content. Guidance for developing instructor-led and print-based instruction will be provided following the release of this document.

Updates to this document will be made periodically to provide content developers with further guidance.

Table of Contents

1.0 Introduction

The purpose of the Navy Reusable Learning Object (RLO) Content Development Guidelines is to direct the consistent development of content to support maximum uniformity and reusability of instructional learning objects.

For examples and best practices in the development of E-Learning Reusable Learning Objects, visit the Integrated Learning Environment (ILE) Community of Practice section in Navy Knowledge Online, http://www.nko.navy.mil.

To learn more about the development of E-Learning Reusable Learning Objects, see the Navy Reusable Learning Object (RLO) Development Process and the Cisco White Paper entitled, *The Reusable Learning Object Strategy*.

2.0 Reusable Learning Objects

What is an RLO?

- A reusable learning object, or RLO, is a lesson packaged with introductory information, instructional content, summary information, and pretest and posttest assessment items.
- The instructional content of the RLO consists of small reusable information objects (RIOs) that are combined to match the needs of the learner, authors, and organization.
- The term “reusable” is used to emphasize one of the advantages of developing smaller, chunked pieces of learning and information.
- An RLO can be compared to a “wrapper” containing content.
- An RLO is based upon a single job task.

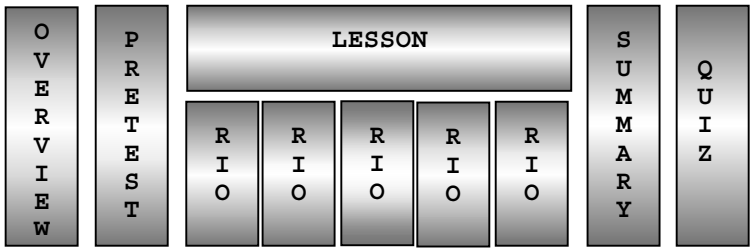
What is a Task?

A **task** is a measurable well-defined unit of work with an identifiable beginning and end. A task is the smallest unit of work performed for its own sake and normally results in a meaningful product. Tasks are completed in hours, not days, weeks, etc.

RLO Structure

Each RLO contains five items:

- *Overview*
- *Pretest*
- *Lesson*
- *Summary*
- *Quiz*



Each RLO includes 7 ± 2 (five to nine) RIOs in the *Lesson* section.

3.0 RLO Sections

Use the following guidelines for the development of the *Overview* and *Summary* sections of the RLO.

3.1 Overview

The *Overview* section serves as an advanced organizer for the students and contains the following items:

- Introduction
- Importance
- Objective
- Prerequisites
- Scenario
- Outline

3.1.1 Introduction

The goal of the *Introduction* item is to explain the purpose of the RLO.

Requirements

- Does not repeat information found in other sections

Options

- May contain multimedia.

Example	Internal-combustion engines are used extensively in the Navy. They serve as propulsion units in a variety of ships and small boats and as engines for motorized ground support equipment. Internal combustion engines are also used as prime movers (that is, drive units) for auxiliary machinery such as generators and pumps. In this lesson, you will learn about internal-combustion engines.
Non-Example	This lesson is on internal-combustion engines.

3.1.2 Importance

The goal of the *Importance* item is to inform learners why they should be interested in the RLO by creating interest and relevance.

Requirements

- States relevance of RLO objectives to learners' job, duty, or task.
- Does **not** repeat information found in other sections.

Options

- May contain multimedia.

Example	The operation of all systems and equipment requires the use of piping systems to transfer fluids, which can be liquids or gases, throughout the ship. Personnel safety and the ship's operational reliability require that all piping systems be in proper operating condition. Knowledge of the system's components will assist you in aligning, troubleshooting, and maintaining fluid systems that support your engineering equipment.
Non-Example	As an engineer, it is important that you know how a piping system operates.

3.1.3 Objective

The goal of the *Objectives* item is to inform learners of the expected outcome of the RLO by telling them what they will be able to do.

Requirements

- States RLO objective, not RIO objectives.
- Begins with this terminology:

  "After completing this lesson, you will be able to…"

Options

- May contain multimedia.

Comments

- See Section 13 of this document for more guidance on Learning Objectives.

Example	After completing this lesson, you will be able to identify the laws, principles, theories, and general construction features of a gas turbine engine.
Non-Example	Upon completion of this lesson, you will be able to do the following: • Identify the laws of a gas turbine engine • Identify the principles of a gas turbine engine • Describe the general construction features of a gas turbine engine

3.1.4 Prerequisites

The goal of the *Prerequisites* item is to inform learners of knowledge and skills needed to complete the RLO.

Requirements

- Focus on the primary (target) audience for the RLO and use the knowledge and skills that were identified in the Design Phase.
- If there are prerequisites, use the following terminology:

  "Before proceeding with this lesson, you should have a basic understanding of the following subjects:"
- If there are no prerequisites for the lesson, then use the following terminology:

  "There are no prerequisites for this lesson."
- List items in a bulleted format, leaving one blank line between the bullet lead and the first bullet.

Options

- May contain multimedia.

Example	Before proceeding with this lesson, you should have a basic understanding of the following subjects: • Gas Turbine Theory and Construction • Gas Turbine Engine Combustors
Non-Example	Also see additional lessons and topics that cover this subject matter.

3.1.5 Scenario

The goal of the *Scenario* item is to relate a story to a job function to motivate the learners and capture their attention.

Requirements

- Relate to RLO subject and learning objective.
- This scenario must be concluded in the *Summary* section of the RLO to bring closure.
- Focus your scenario on the level of understanding of the primary (target) audience for the RLO.

Options

- You can use a fictitious situation, or pose a problem, to help explain the purpose of the RLO.
- Suggestion for a scenario:

  "Seaman Jones has been tasked with . . ."
  "Ashore and afloat, you may . . ."

- May contain multimedia.

Example	You are standing watch on the flightline. During your watch, you start feeling fatigued. The next thing you remember is waking up on the grass next to the flightline with an IV in your arm. You are still disoriented and ask, "What am I doing here?" and "What happened to me?" The corpsman says that you are suffering from heat exhaustion and that the IV in your arm is to replenish some of your body fluids.
Non-Example	You fainted because you suffered from heat exhaustion. You should have been more careful.

3.1.6 Outline

The goal of the *Outline* item is to list all of the topics contained in the RLO.

Example	What are the Principles of Electrical Generation? What is an Elementary Generator? What is an Elementary DC Generator? What are the Effects of Adding Coils and Poles? What are Commutation and the Effects of Armature Reaction?
Non-Example	What is/are the following: • Principles of Electrical Generation • Elementary Generator • Elementary DC Generator • Effects of Adding Coils and Poles • Commutation • Effects of Armature Reaction

3.2 Summary

The goal of the *Summary* section is to bring the lesson to an end by reviewing what the learner has just learned and concluding the scenario in the *Overview* section.

The *Summary* section contains the following items:

- Review
- Next Steps
- Additional Resources

3.2.1 Review

The goal of the *Review* item is to recap the key points from all RIOs in the RLO.

Requirements

- Touches on main points presented in RIOs.
- Restates *Objective* and *Importance* of the RLO.
- Concludes the scenario started in the *Scenario* item.

Options

- Try to keep text count around 100 words.
- May contain multimedia.

Example	This completes the lesson for basic environmental safety dealing with heat stress. You should be able to identify the different environment and areas that might pose a heat-stress condition. You should also know how to prevent heat stress, and, if necessary, how to administer first aid for heat-stress injuries. Based on the original scenario, you should now realize that there are several things you could have done that would have kept you from succumbing to the heat. Even such simple things as drinking more water before you went on watch and getting more sleep—instead of staying up and playing cards with your buddies!—would have made a big difference.
Non-Example	You have just learned about heat stress and how to avoid it.

3.2.2 Next Steps

The goal of the *Next Steps* item is to direct the learner to additional steps that would further their knowledge of the subject presented in the RLO.

Required

- List other areas of study that correspond with the RLO subject.
- Do **not** list the names of RLOs or RIOs.
- Use the following terminology:

  "It is recommended that you research the items listed below to gain a fuller understanding of this subject:"

- List items in a bulleted format, leaving one blank line between the bullet lead and the first bullet.

Example	It is recommended that you research the items listed below to gain a fuller understanding of this subject: ▪ Naval Aeronautic Publications Index (NAPI) ▪ Primary Weapons Systems Technical Manuals
Non-Example	Related study areas regarding the subject would include the following topics: **Gas Turbine Theory and Construction.** This lesson can be found on Navy E-Learning. **NAVEDTRA 14008**- Aviation Machinist's Mate 3&2 **S9234-BL-GTP-010**- FFG7 Class PPM. **http://flthlpdsk.chinalake.navy.mil/SHIPS/shipeng/engineer.htm** This web site gives information concerning marine gas turbine theory, design and construction. Date Visited Dec. 12, 2002.

3.2.3 Additional Resources

The goal of the *Additional Resources* item is to provide more information about the knowledge and skills covered in the RLO.

Requirements

- Lists URLs, PDFs, documents, instructions, and other resources that provide more information on the RLO subject.
- List resources in bold font and provide a one-sentence description following the reference.
- Display resources in this order:
    1. Publications in alphabetical order
    2. Web sites “Date Visited month day, year”
    3. General areas
- Use the following terminology:

  “The following items will provide more information on the topics that were covered in this lesson:”
- List items in a bulleted format, leaving one blank line between the bullet lead and the first bullet.

Example	The following items will provide more information on the topics that were covered in this lesson: • **NAVEDTRA 14008- Aviation Machinist's Mate 3&2** The nonresident training course provides additional information on basic gas turbine theory and construction. • **S9234-BL-GTP-010- FFG7 Class Propulsion Plant Manual.** This is a PPM. • **http://flthlpdsk.chinalake.navy.mil/SHIPS/shipeng/engineer.htm** This web site gives information concerning marine gas turbine theory, design and construction. Date Visited Dec. 12, 2002.
Non-Example	See the following topics for additional resources. *Naval Ships' Technical Manuals* provide detailed pump information. NAVEDTRA 14104, Fireman

4.0 Reusable Information Objects

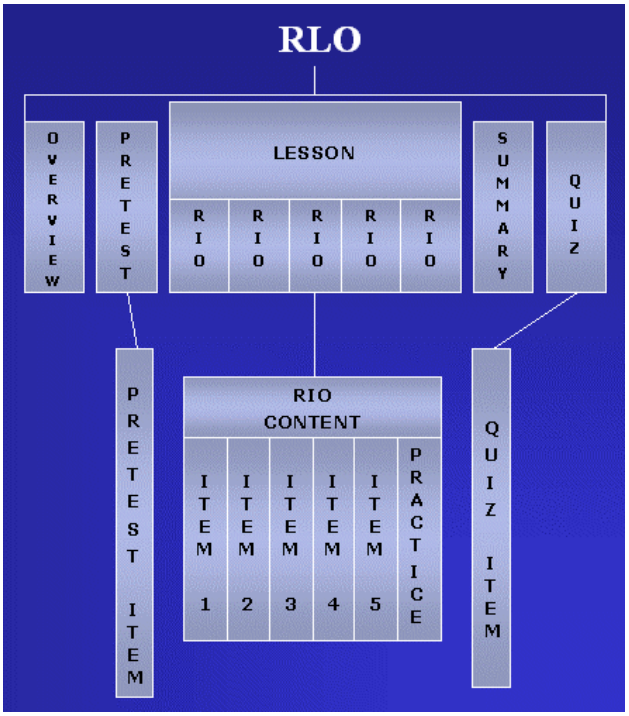
What is a RIO?

- A reusable information object, or RIO, is a self-contained chunk of information built to accomplish a single learning objective.
- RIOs are the instructional content contained within the RLO "wrapper."
- RIOs are combined to form the *Lesson* section of the RLO.
- A RIO is referred to as a "topic" within the *Lesson* section of the RLO.

RIO Structure

Each RIO has correlating components, which are as follows:

- Pretest item(s)
- Content items will vary by RIO. See *RIO Content Item Count* section.
- Practice item(s)
- Quiz item(s)



Five Types of RIOs

There are five types of RIOs:

- Concept
- Fact
- Procedure
- Process
- Principle

Each type of RIO uses a specific template that must be followed precisely when developing RIO content.

5.0 RIO Types and Templates

What Are RIO Templates?

- RIO templates list the required and optional content items for each RIO type.
- The required items identified in the templates are essential for teaching each RIO type.

Must I Follow the Templates?

- Yes! The templates were developed after many months of research. The strategies used in the templates have been proven effective for training and any straying from the template could negatively impact the learning.

Tips for Development

- The content included in the RIO should only include need-to-know information. Template items should not be accompanied by excess information unnecessary for instruction.
- When designing content for E-Learning, remember to use plenty of white space: keep your screens uncluttered.
- Avoid the “wall of words,” or long, wordy paragraphs. One-sentence paragraphs are allowed.
- Be concise. The recommended number of words used in E-Learning content should be half of what is usually found in a book or manual.
- Text for E-Learning content should be in the range of 100 words per screen.
- When technical documentation or detailed written procedures exist, refer the student out to the documentation.

5.1 Concept RIO

Definition

A Concept is a class of items that shares common key features and is known by a common name.

When to Use a Concept RIO

Use a Concept RIO for the following situations:

- To teach a group of objects, symbols, or events that:
  - Are designated by a single word or term.
  - Share a common feature.
  - Vary on irrelevant features.

- To answer the questions:
  - "Why is it?"
  - "Why is it so?"

Location of a Concept RIO within the RLO

When sequencing the RIOs within the RLO, keep in mind that, typically, concepts are taught first, because they represent the knowledge needed to perform a task.

For example, if you are creating an RLO to teach the replacement of a monitor, then you may need a Concept RIO entitled "What Is a Monitor?" in your RLO.

Title Requirements

A Concept RIO title must be written in:

- The form of a question.

- Title case with initial caps on important words and verbs.

Example	• What Is a …? • What Are the Types of …?
Non-Example	• Liquid cooling systems • The operation of gas turbine engines

5.1.1 Concept RIO Template

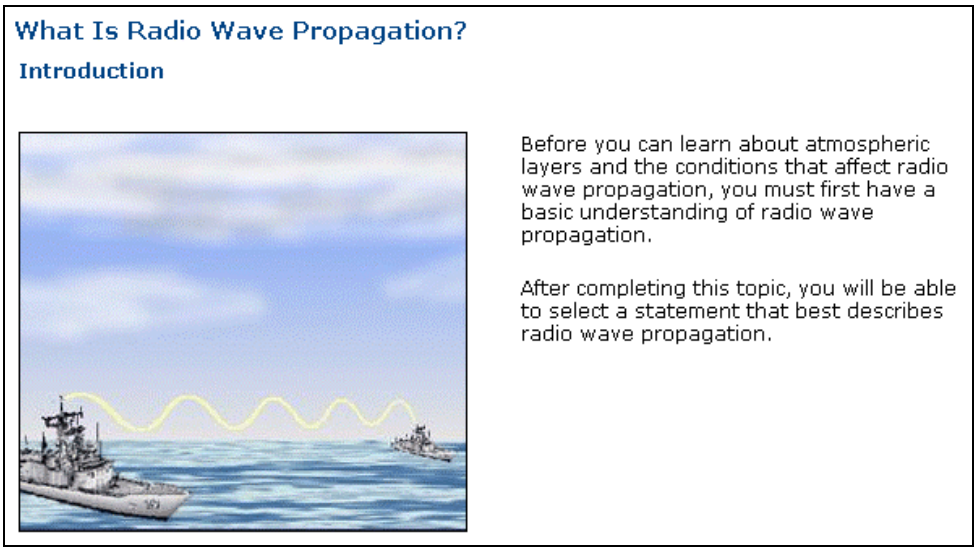
Introduction	• **Required**. • Establish the purpose of the RIO and orient learners to what they are expected to learn. • Keep short and to the point. • Include Learning Objective as last paragraph. • Do **not** tie to other RIOs or assume that the learner has visited other RIOs within an RLO.
Definition	• **Required**. • Can be a graphic or illustration. • Identify related characteristics clearly. • Keep short and concise. • Use bullets to list characteristics. • Define the concept. • Emphasize the term being defined.
Facts	• **Optional**. • Use only when needed to explain the concept. • Follow the guidelines for fact blocks defined in the Fact RIO guidelines. • If there are many facts to communicate or if a fact requires a number of blocks to describe, then escalate to a Fact RIO.
Examples	• **Required**. • Ideally, include two or more examples. • Sequence examples from simple to complex. • Use examples from different contexts. • Present using text, graphics, videos, or animations.
Non-Example	• **Optional**. • Illustrate easily confused examples of related concepts. • Sequence from simple to complex. • Present using text, graphics, videos, or animations. • State why it is not an example.
Analogy	• **Optional**. • An analogy is correspondence in some respects between otherwise dissimilar things. • Make instructionally powerful. • Relate to the background of the audience.

* Interaction and review items are optional. See Section 6 for guidance.

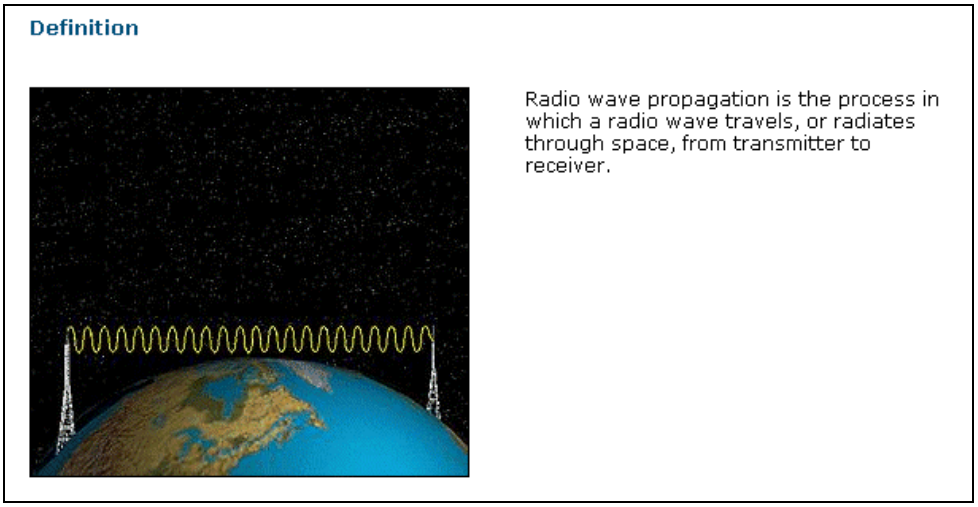
5.1.2 Concept RIO Example Explained

Introduction Introduce the topic of the RIO.

The last paragraph will be a one-sentence informal learning objective.



Definition Provide a clear definition that states the key features of the concept.

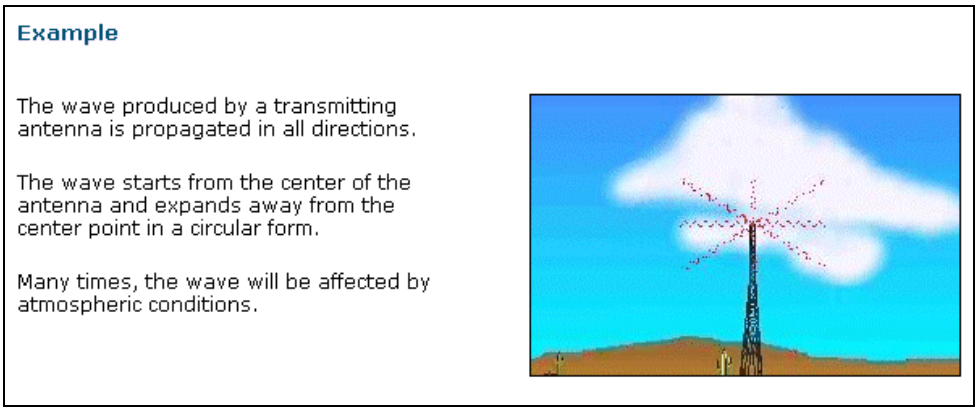


Example

Provide a real instance of the concept.

The example helps make the definition concrete.

- For a simple concept, one example will do.
- For a complex concept, more examples will be needed.
- When using more than one example, start with the most common example and move towards the least common.
- All examples must contain the key features of the concept.

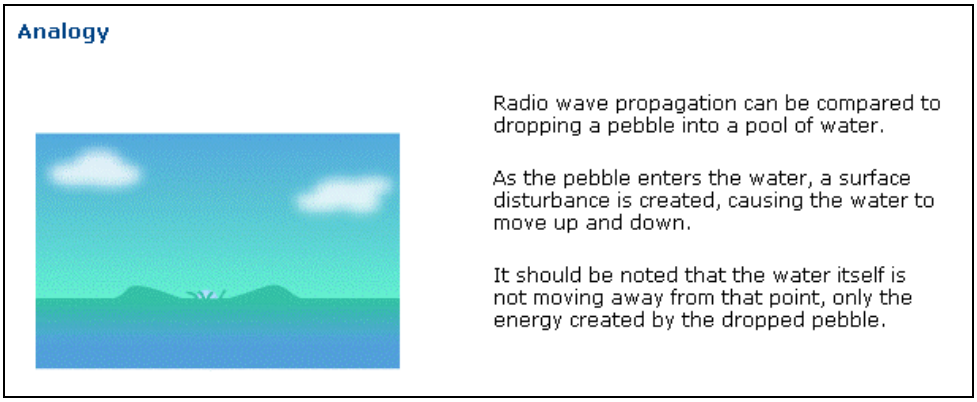


Analogy

An analogy is another representation of a concept.

An example of an analogy would be using a pie cut into slices to teach the concept of fractions.

Analogies help the learner to relate a new concept (something unfamiliar) to a known concept (something familiar).



5.2 Fact RIO

Unlike concepts, in which all members of the group share common properties, facts are unique, one-of-a-kind types of information.

There are three types of facts:

- Specific concrete objects
- Unique or specific data
- One-of-a-kind associations among concepts (statements)

Specific concrete objects	NAVEDTRA 130A
Unique or specific data	Executive Order signed on 19 Dec 02 by President George W. Bush states that all civilian employees are excused for the last half of their scheduled hours on Tuesday, 24 December 02.
One-of-a-kind associations among concepts (statements)	The new Command Master Chief is CTAMC Smith.

For training purposes, every fact must be memorized separately, making it more difficult to retain.

When to Use a Fact RIO

Use a Fact RIO to teach unique, specific, one-of-a-kind pieces of information, such as:

- Statements
- Data
- Pictures of specific objects

Title Requirements

A Fact RIO title must be:

- Written in title case with initial caps on important words and verbs.
- The name of the actual fact.

Example	• Standard Drill Gauges • Engineering Schematic Symbols
Non-Example	• What are Standard Drill Gauges? • The Basic Steam Cycle

Fact vs. Concept

To differentiate between a factual versus a conceptual task, ask yourself the following questions:

- "Are there many different examples of this subject that share key features, but vary on irrelevant features?" (If the answer is yes, then you have a concept.)
- "Is this information unique and specific to this instance?" (If the answer is yes, then you have a fact.)

5.2.1 Fact RIO Template

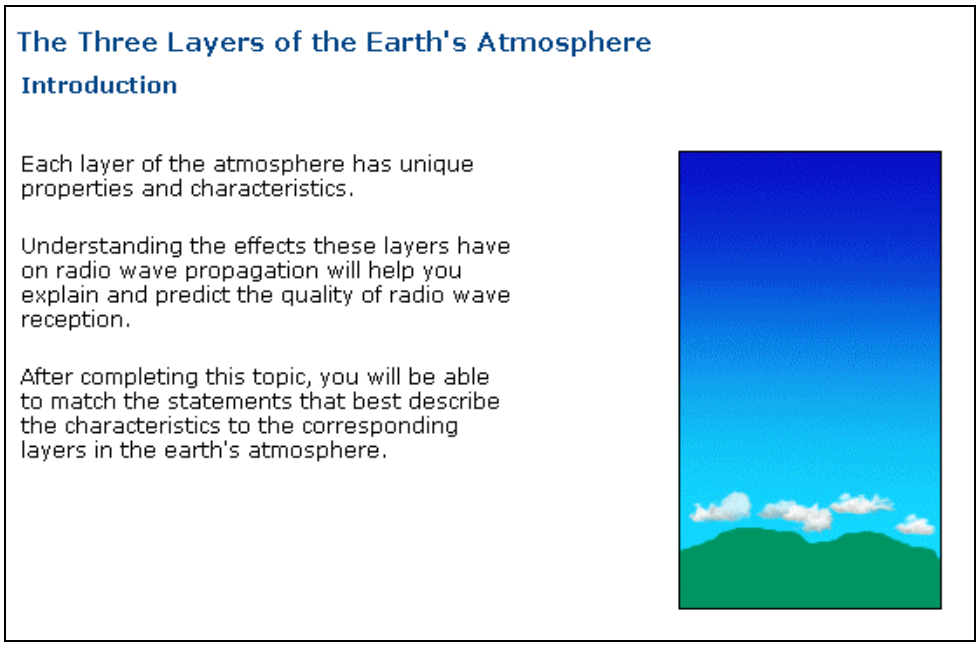
Introduction	• **Required**. • Establish the purpose of the RIO and orient learners to what they are expected to learn. • Keep short and to the point. • Include Learning Objective as last paragraph. • Do **not** tie to other RIOs, or assume that the learner has visited other RIOs within an RLO.
Use any combination of the following items (type and number based on objective).	
Facts – Graphic	• Use graphics, fact lists, and tables as needed in any combination or order. • Precede the graphic with a sentence telling what it is. • Identify the key parts. • Follow with a table detailing the key parts. • Label with a few descriptive words.
Facts – List	• Precede the list with a sentence telling what it is. • Categorize further using sublabels as needed. • Label to indicate what it includes.
Facts - Table	• Precede with a sentence telling what it is. • List the parts with their function. • Use appropriate column headings. • Label to indicate what it includes.

* Interaction and review items are optional. See Section 6 for guidance.

5.2.2 Fact RIO Example Explained

Introduction Introduce the topic of the RIO.

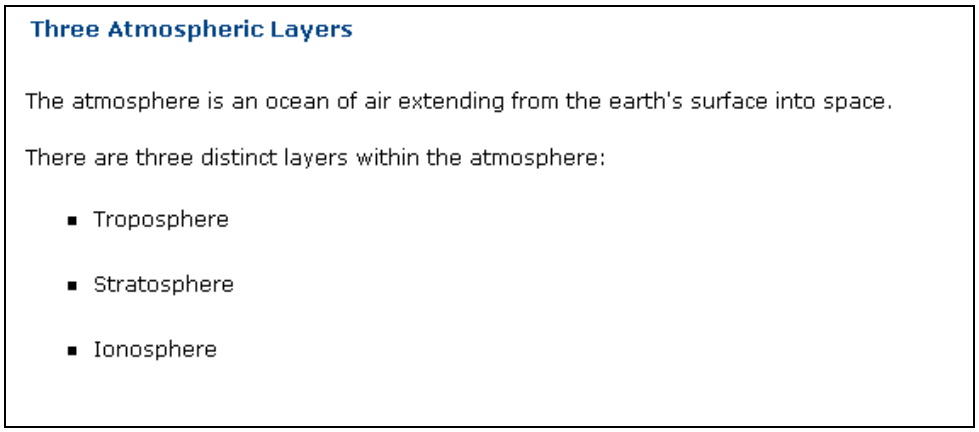
The last paragraph will be a one-sentence informal learning objective.



Facts-List Tell what is the fact.

Provide corresponding list.

Label as necessary.

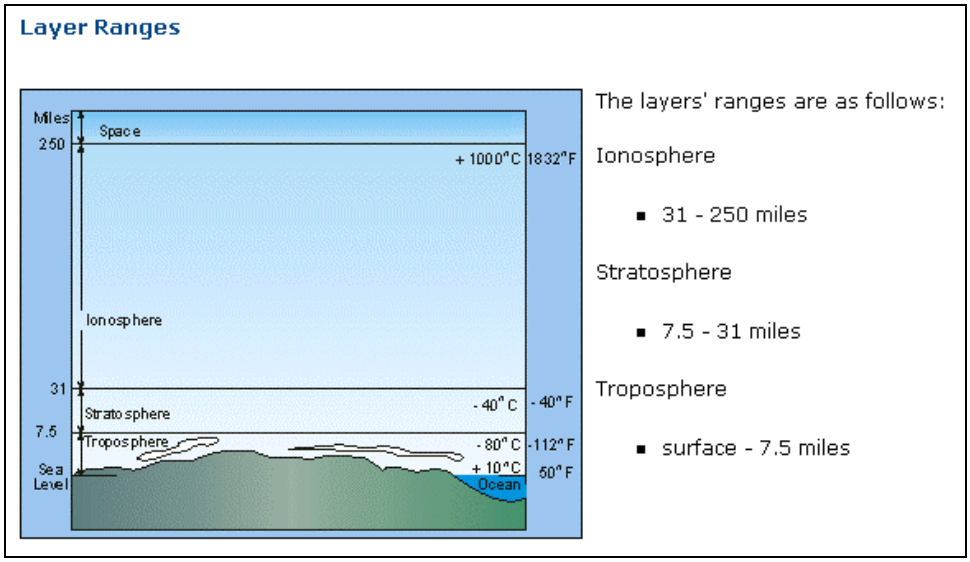


Facts-Graphic

Use graphics, fact tables, and lists as needed.

Tell what the graphic represents.

Label the key parts.



Facts-Table

Describe the contents of the table.

The number of tables will be based on the objective.

Describe listed parts/functions.

Use descriptive and concise column headings.

Label graphics if used.

Table 1

Ionosphere

The following are characteristics of the Ionosphere:

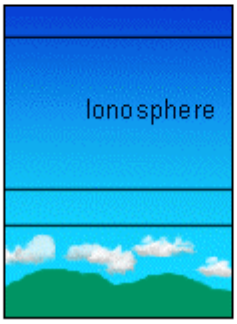
Facts	Location	Effects on Radio Wave Propagation
Directly related to ▪ Sun's radiation ▪ Changes in sun's activity ▪ Movement of the earth around the sun	▪ Highest of three layers 	▪ Variations in the Ionosphere have important effects. ▪ Variations produce electrically charged gas atoms called ions. ▪ Ions enable radio waves to be propagated great distances.

Table 2

Stratosphere

The following are characteristics of the Stratosphere:

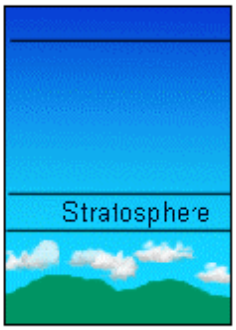
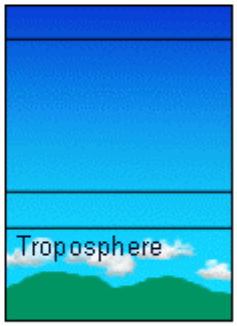
Facts	Location	Effects on Radio Wave Propagation
▪ Little to no temperature change ▪ Little water vapor/moisture in this layer ▪ Calm region	▪ Middle layer 	▪ Almost no effect

Table 3

Troposphere

The following are characteristics of the Troposphere:

Facts	Location	Effects on Radio Wave Propagation
▪ Most weather occurs in this layer. ▪ Temperature decreases rapidly with altitude. ▪ Variations in temperature pressure and density causes turbulence.	▪ Bottom layer closest to earth 	▪ Weather conditions can have a profound effect.

Note: In the preceding examples, the screen displays were all taken from a RIO entitled “The Three Layers of the Earth’s Atmosphere.” You may have noticed that the *Facts – Graphic* and *Fact – Lists* items were displayed in a different order than in the template. Use your discretion. As long as the order does not affect the logical and sequential construct of the content, you may switch the order.

Also, there are three *Facts – Table* items. The items correspond with the objective of the topic.

5.3 Procedure RIO

Definition

A Procedure RIO is developed when you need to teach a sequential set of steps to be followed by one individual to accomplish a task or make decisions. Actions within a procedure must be done the same way each time within a given situation.

When to Use a Procedure RIO

Use a Procedure RIO when you can write the job task or topic as:

- How to **. . .**
- Configuring the **. . .**
- Operating the **. . .**
- Verifying the **. . .**

Location of a Procedure RIO within the RLO

Usually a Procedure RIO will follow a Concept or Process RIO.

For example, if you are creating an RLO to teach the procedure for replacing a pump gasket, then you may need a Concept RIO entitled "What Is a Pump Gasket?" to precede any Procedure RIOs.

Title Requirements

A Procedure RIO title must:

- Be written in title case with initial caps on important words and verbs.
- Describe the procedure being presented.

Example	• How to Fill Out a Danger Tag • How to Complete a Leave Chit • How to Create an Automatic Out of Office Reply in Microsoft Outlook
Non-Example	• How do I fill out a Danger Tag? • How is a Leave Chit Completed?

5.3.1 Procedure RIO Template

Introduction	• **Required**. • Establish the purpose of the RIO and orient learners to what they are expected to learn. • Keep short and to the point. • Include Learning Objective as last paragraph. • Do **not** tie to other RIOs or assume that the learner has visited other RIOs within an RLO.
Facts	• **Optional**. • Use only when needed to explain the procedure. • Facts could appear as a column in a procedure table. For example, Shortcut Keys/Function. • Follow the fact block guidelines defined in the Fact RIO guidelines. • If there are many facts to communicate, or a fact requires a number of blocks to describe, then escalate to a Fact RIO.
Choose one table type per Procedure RIO.	
Procedure Table	• Use an introductory sentence. • Label columns “STEP ... ACTION.” • Begin each step with an action verb. • Limit each step to one activity.
Decision Table	• Use an introductory sentence. • Label columns “IF ... THEN.” • Write condition (if) and action (then) so they form a complete sentence. • Move repeated words into the column header.
Combined Table	• Follow guidelines for both procedure and decision tables. • Usually begin as a procedure table, with a decision table as one of the steps. • Structure as a table within a table.
Demonstration	• **Optional**. • Use to illustrate a procedure.

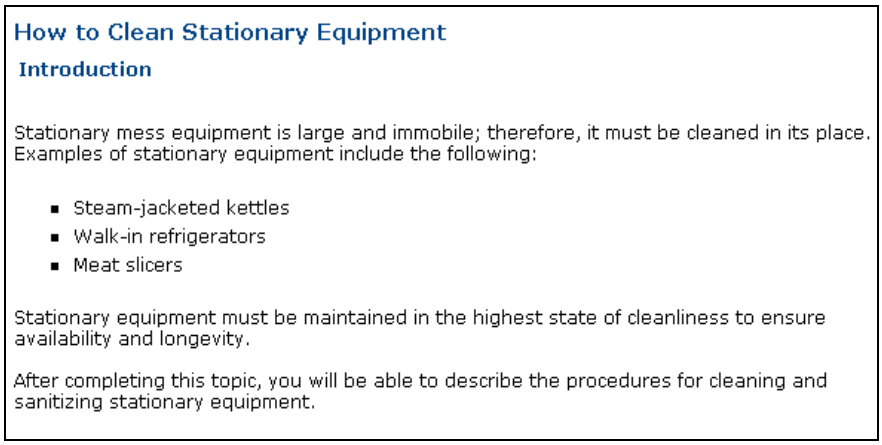
* Interaction and review items are optional. See Section 6 for guidance.

5.3.2 Procedure RIO Example Explained

Introduction

Introduce the topic of the RIO.

The last paragraph will be a one-sentence informal learning objective.



How to Clean Stationary Equipment

Introduction

Stationary mess equipment is large and immobile; therefore, it must be cleaned in its place. Examples of stationary equipment include the following:

- Steam-jacketed kettles
- Walk-in refrigerators
- Meat slicers

Stationary equipment must be maintained in the highest state of cleanliness to ensure availability and longevity.

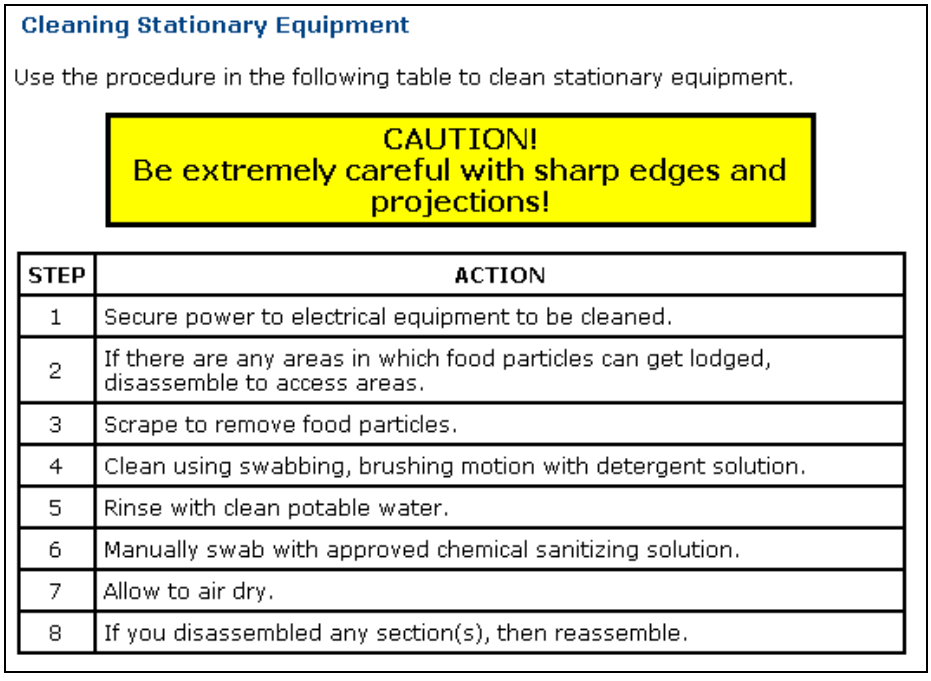
After completing this topic, you will be able to describe the procedures for cleaning and sanitizing stationary equipment.

Procedure Table

A Procedure Table has two columns labeled “STEP … ACTION.”

Each step will only have one activity.

Step can be a number, as in a list.



Cleaning Stationary Equipment

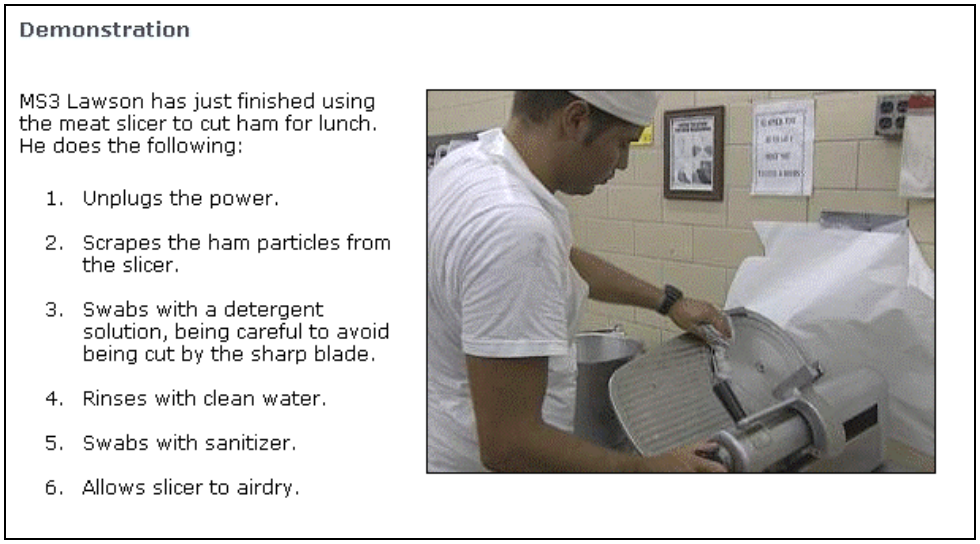
Use the procedure in the following table to clean stationary equipment.

CAUTION!
Be extremely careful with sharp edges and projections!

STEP	ACTION
1	Secure power to electrical equipment to be cleaned.
2	If there are any areas in which food particles can get lodged, disassemble to access areas.
3	Scrape to remove food particles.
4	Clean using swabbing, brushing motion with detergent solution.
5	Rinse with clean potable water.
6	Manually swab with approved chemical sanitizing solution.
7	Allow to air dry.
8	If you disassembled any section(s), then reassemble.

Demonstration A follow-on demonstration is not required, but it is most helpful for learning a task or showing how a procedure is done.

A video or animation demonstrating the task is excellent reinforcement.



Note: A decision table or a combination table can be used instead of a procedure table.

A slide show can be used in place of a table. However, it is good practice to develop a table that coincides with the slideshow so that the learner has the option to view the complete table.

Decision Table A decision table has two columns labeled "IF … THEN."

Write the "If…then" statement as a complete sentence. In the table below, the first middle row could be written as: "*If* the pressure on the tire iron will not loosen the lug nut, *then* apply lubricant."

IF…	THEN…
pressure on the tire iron will not loosen the lug nut,	apply lubricant.
there is no spare tire,	call the local tire store.

Combined Table

Sometimes tables can be combined. A decision table can reside in a Procedure "STEP…ACTION" table.

Inspection of Chest

The following steps should be taken when looking for paradoxical motion and crepitation.

<table>
<tr><th>STEP</th><th>ACTION</th><th>COMMENT</th></tr>
<tr><td>Inspect chest</td><td>

Palpate the clavicles (collarbones).
Feel for equal expansion of both sides of chest during respiration.

This technique is known as compression.
<table>
<tr><th>IF. . .</th><th>THEN. . .</th></tr>
<tr><td>compression of rib cage, breathing or coughing causes pain,</td><td>patient may have rib fracture.</td></tr>
<tr><td>patient has point tenderness, deformity, bony crepitus, or painful reaction to compression,</td><td>patient may have rib fracture(s) or flail chest.</td></tr>
</table>

Continue palpation of entire rib cage.

Slide hands under patient's shoulder blades (scapulae).
Feel for DCAP-BTLS.

</td><td>It is important to realize that closed chest injuries (injuries where there is no obvious penetrating trauma) may involve structures inside the chest as well. It is also possible that blunt forces may have damaged internal organs, or that fractures of the ribs or sternum have punctured organs.</td></tr>
</table>

5.4 Process RIO

Definition

A Process RIO is developed when you need to teach a series of actions, changes, or functions that achieve an end or result. It often is used when you need illustrate a flow of events that describe how something works.

This type of RIO describes a task that involves more than one person and may involve many people or an entire organization.

When to Use a Process RIO

Use a Concept RIO for the following situations:

- To teach how a system works
- To support underlying job tasks
- To teach a task that involves many persons
- To answer the questions:
  - "How does it work?"
  - "What happens when…?"

Location of Process RIO within the RLO

A Process RIO can be placed at any point within an RLO.

If the goal of the RLO is to teach the process, then multiple Process RIOs may be included with Concept RIOs.

If a Process RIO is being presented to establish the context of a procedure, then it should come before the Procedure RIO within the RLO.

Title Requirements

A Process RIO title must:

- Be written in title case with initial caps on important words and verbs.
- Describe the process being presented.

Example	• How a Transmission Works • Stages of Enlistment • The Lifecycle of Aircraft Development • How Sailors Are Trained
Non-Example	• How Does the Transmission Operate? • What are the stages of enlistment?

5.4.1 Process RIO Template

Introduction	• **Required**. • Establish the purpose of the RIO and orient learners to what they are expected to learn. • Keep short and to the point. • Include Learning Objective as last paragraph. • Do **not** tie to other RIOs, or assume that the learner has visited other RIOs within an RLO.
Facts	• **Optional**. • Use only when needed to explain the process. • Follow the fact block guidelines defined in the Fact RIO guidelines. • If there are many facts to communicate, or a fact requires a number of blocks to describe, then escalate to a Fact RIO.
Choose one of the following.	
Staged Table	• Use an introductory sentence. • Label columns with "STAGE … WHAT HAPPENS." • Begin with who or what is responsible for the action in that stage. • Write in the third person, active voice. • Limit each stage to one time period.
Block Diagrams	• Use an introductory sentence. • Use a block diagram (flow chart). • Begin with who or what is responsible for the action in that stage. • Write in the third person, active voice. • Limit each stage to one time period.
Cycle Charts	• Use an introductory sentence. • If possible, begin with who or what is responsible for the action in that stage. • Write in the third person, active voice. • Label chart as a process. • Use arrows to show direction.

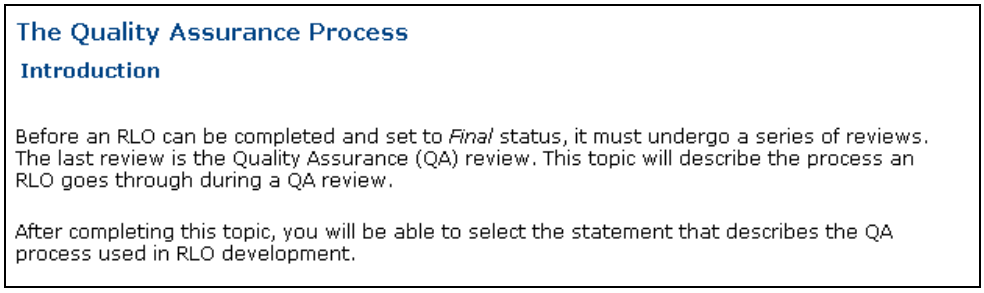
* Interaction and review items are optional. See Section 6 for guidance.

5.4.2 Process RIO Example Explained

Introduction

Introduce the topic of the RIO.

The last paragraph will be a one-sentence informal learning objective.


The Quality Assurance Process

Introduction

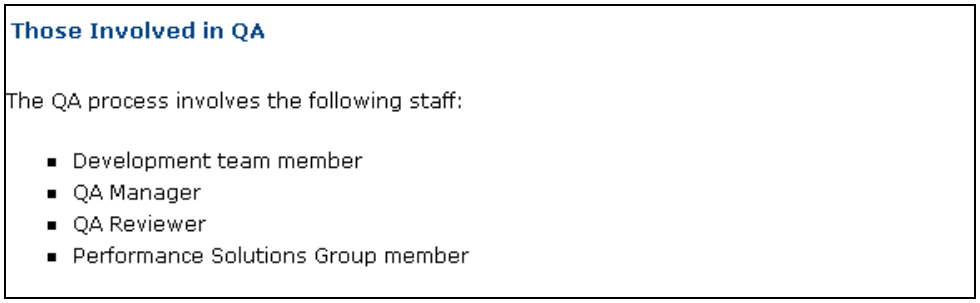
Before an RLO can be completed and set to *Final* status, it must undergo a series of reviews. The last review is the Quality Assurance (QA) review. This topic will describe the process an RLO goes through during a QA review.

After completing this topic, you will be able to select the statement that describes the QA process used in RLO development.

Facts

Only list facts that are needed to explain the process.

The title of the *Facts* content item should not be "Facts." In the following graphic, the *Facts-List* item is labeled "Those involved in QA."


Those Involved in QA

The QA process involves the following staff:

- Development team member
- QA Manager
- QA Reviewer
- Performance Solutions Group member

Staged Table

When using a staged table, be sure to include an introductory sentence or title describing the table.

A staged table should contain headings that depict the stages and what happens in each of those stages.

The preferred column headings are "STAGE ... WHAT HAPPENS." However, there will be times when the content will not fit with those headings.

The following are suggested headings for staged tables. You may find other headings that fit the content better.

- “EVENT … ACTIONS”
- “CAUSE … EFFECT”
- “PERIOD … OCCURRENCE”
- “PHASE … PROCEDURE”

Headings must be in all capital letters.

QA Process Staged Table

There are seven basic stages in the QA process. Each stage in this table states the responsibilities of those involved in the process.

STAGE	WHAT HAPPENS
RLO goes to QA	QA manager assigns QA reviewer an RLO.
QA review (1st look)	QA reviewer carefully inspects RLO and produces QA report.
QA review completed	QA reviewer gives QA report to QA manager.
QA revision	Development team makes changes in accordance with report.
QA revision completed	Development team notifies QA manager that revisions have been made.
QA verification (2nd look)	QA manager reviews report and notes any discrepancies. ▪ If discrepancies exist that affect the instruction of the RLO, the RLO is sent back to the QA revision stage. ▪ If there are no discrepancies, the RLO is sent to the Performance Solutions Group member.
Final Status	RLO is marked "Final" by Performance Solutions Group member.

Note: A block diagram or a cycle chart can be used instead of a process table.

Block Diagrams

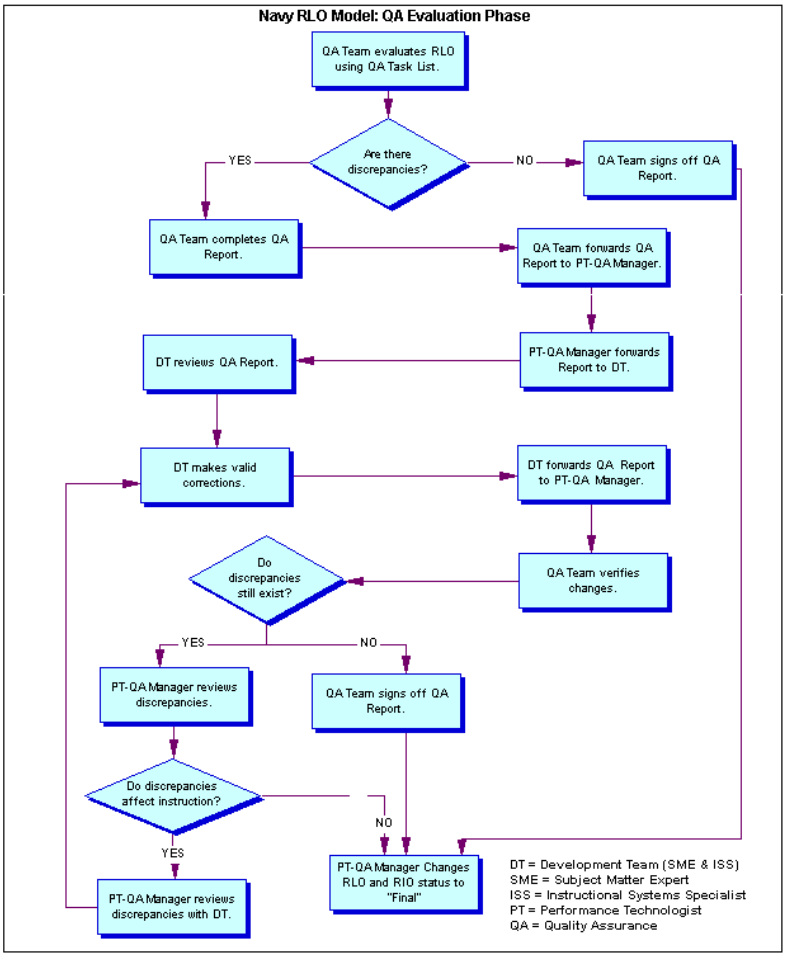
A blocked diagram can be a flowchart or a flow diagram.

When using a flowchart, be sure to include an introductory sentence or title describing the flowchart.

The Quality Assurance Process

QA Process Flowchart

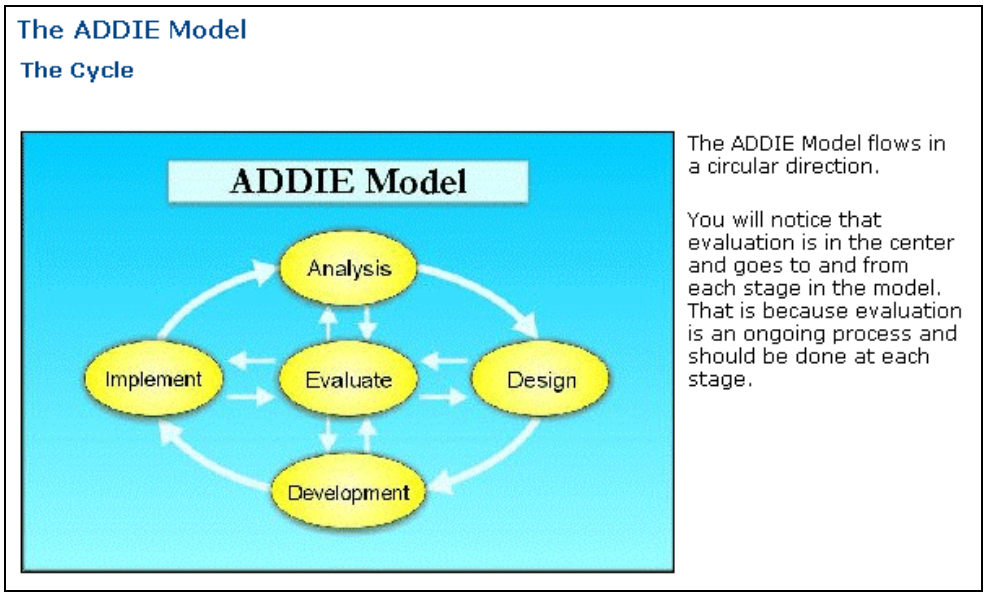
The QA process is designed to be a thorough and final review of the RLO. The process involves many stages. The graphic below diagrams this process.



Cycle Charts

A cycle chart is a chart that illustrates the various stages in a repetitive cycle in the order in which they occur.

When using a cycle chart, be sure to include an introductory sentence or title describing the chart.



5.5 Principle RIO

Definition

A Principle RIO is developed when you need to teach a procedural job task that requires judgment or when guidelines must be applied to a situation.

When to Use a Principle RIO

Use a Principle RIO when you can write the job task or topic as:

- How to **. . .**
- Guidelines for **. . .**

Location of a Principle RIO within the RLO

A Principle RIO usually follows a Concept or Process RIO.

For example, if you are creating an RLO to teach the guidelines for handling personnel conflicts, the Concept RIO titled "What Is a Conflict?" may be taught first.

Title Requirements

A Principle RIO title must:

- Be written in title case with initial caps on important words and verbs.
- Name the principle-based procedure.

Example	• How to Fill Out a Danger Tag • How to Complete a Leave Chit • How to Create an Automatic Out of Office Reply in Microsoft Outlook
Non-Example	All machinist ratings

Principle vs. Procedure Title

Notice the Principle and Procedure RIOs both start with "How to."

The distinction is that the Principle RIO focuses on how the learner will apply guideline in a given situation when there are alternative options.

5.5.1 Principle RIO Template

Introduction	• **Required**. • Establish the purpose of the RIO and orient learners to what they are expected to learn. • Keep short and to the point. • Include Learning Objective as last paragraph. • Do **not** tie to other RIOs or assume that the learner has visited other RIOs within an RLO.
Facts	• **Optional**. • Use only when needed to explain the principle. • Follow the fact block guidelines defined in the Fact RIO guidelines. • If there are many facts to communicate or a fact requires a number of blocks to describe, then escalate to a Fact RIO.
Principle Statement	• **Required**. • Provide a statement describing the accepted standard of behavior.
Guidelines	• **Required**. • Derive guidelines from your analysis of expert performance. • List the guidelines.
Example	• **Required**. • Two or more examples are recommended. • Vary the context of each example. • Use different settings and situations.
Non-Example	• **Optional**. • Draw attention to how guidelines are violated. • Violate one guideline at a time. • State which guideline was not followed and why.
Analogy	• **Optional**. • Make instructionally powerful. • Must make easily identifiable.

* Interaction and review items are optional. See Section 6 for guidance.

5.5.2 Principle RIO Example Explained

Introduction

Introduce the topic of the RIO.

The last paragraph will be a one-sentence informal learning objective.

Conditions for Cleaning Stationary Equipment

Introduction

Stationary equipment is mess equipment that is large and immobile; therefore, it must be cleaned in place.

To maintain cleanliness, stationary equipment should be cleaned on a regular basis. In addition to the regularly scheduled cleaning, stationary equipment will have to be cleaned depending on certain conditions.

After completing this topic, you will be able to identify conditions under which stationary equipment should be cleaned and sanitized.

Principle Statement

The principle statement will describe the accepted standard of behavior.

Principle Statement

Stationary equipment in food service can be a major source of food borne illness hazards.

In order to reduce the chances of these hazards, stationary equipment should be cleaned whenever contamination is possible.

Guidelines

List the guidelines for expert performance.

Guidelines

Food contact surfaces of equipment used in food operations should be cleaned under the following circumstances:

- After each use, if the equipment was used in non continuous food operations
- After a substantial interruption of operations in which contamination may have occurred
- Each time there is a change in processing between types of raw animal products such as beef, pork, or poultry
- Throughout the day at intervals necessitated by food temperature, type of food, and food particle accumulation
- After final use each work day

Example

Provide at least two separate examples to illustrate the guidelines being applied.

First Example

The galley has just finished serving chili to the crew.

MSC Crean tells Seaman Smith, "We're done with the steam kettle. Let's start the cleanup."

Additional Example

Second Example

MS3 Lawson has used the meat slicer to cut ham for lunch.

Before he begins dinner preparations, he unplugs the power, and begins cleaning the slicer.

6.0 Interaction and Review Items

Reinforcement is a key component for effective retention of learned material. Providing interaction items within the body of the RIO and comprehensive review items at the end of the RIO provide this reinforcement.

The interaction and review items are optional within each RIO. The more items a RIO contains, the more reinforcement is needed. For a RIO that contains only three small items, extra reinforcement may not be practical.

The amount of content in the RIO will drive the necessity for interaction and/or review items.

6.1 Interaction Items

Interaction items are like practice items. They provide the learners with opportunities to apply their newly acquired knowledge.

Interaction Items vs. Practice Items

The differences between interaction items and practice items are listed in the following table.

Interaction Items	Practice Items
Location: placed anywhere within the body of the RIO.	**Location:** placed at the end of the RIO.
Interaction items provide learners opportunities to apply, reflect, or elaborate on individual instructional components within the RIO.	Practice Items provide summary practice assessment at the end of the RIO.

Interaction Types

Two types of interaction Items exist.

1. Physical - defined as purposeful manipulation of input devices (e.g., mouse actions, keystrokes).

2. Mental - defined as simulation-like questions.

6.1.1 Physical Interaction Items

Physical interaction items require the learner to do something physical with the computer to apply the material presented within the RIO.

Examples	• Drag-and-drops • Matching exercises • Simulations

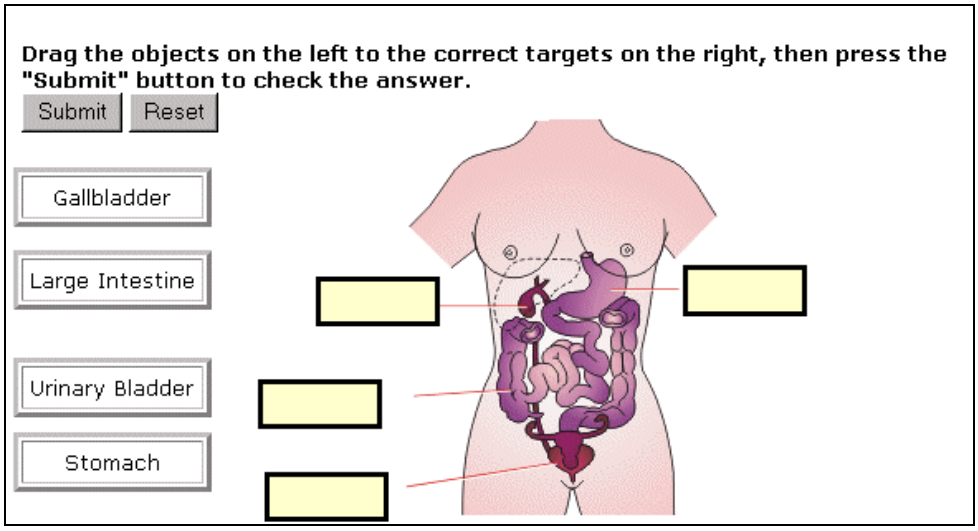
Guidelines for Physical Interaction Items

1. Require physical actions with mouse or keyboard.

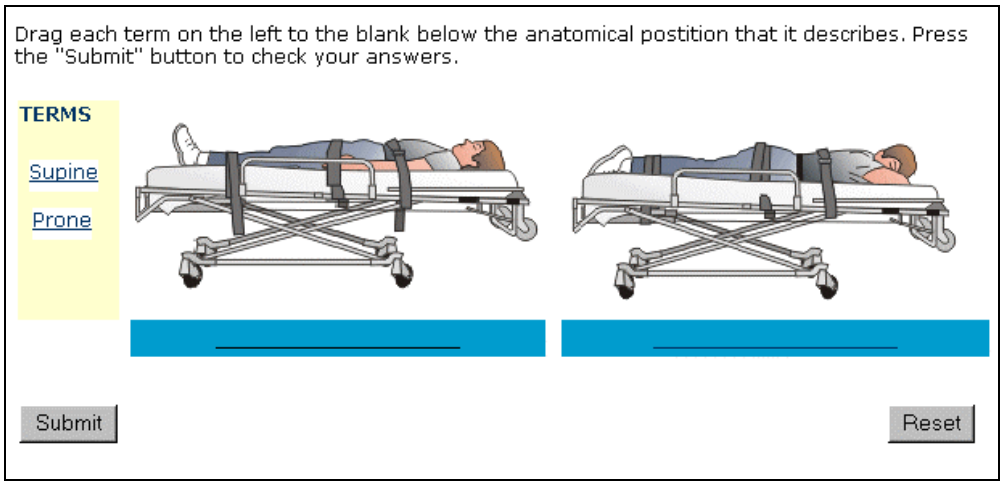
2. Reference information presented within the RIO prior to the interaction -- **not** new information.

3. Provide feedback to responses.

Example1



Example 2



6.1.2 Mental Interaction Items

Mental interaction items are mental exercises, which require the learner to reflect on or solve problems associated with the material presented within the RIO.

Example	Asking situational or scenario-based questions of learners

Guidelines for Mental Interaction Items

1. Require mental consideration of novel situations without physical input actions.
2. Reference information presented within the RIO prior to the interaction -- **not** new information.
3. Provide suggested solutions or some form of feedback. Feedback may be provided separately from the screen on which the interaction occurs.

Example 1

Now that you have learned the steps of conflict identification, consider the following questions about a conflict that you recently experienced.

1. Who were the participants in the conflict?
2. What emotions were involved in the conflict?
3. What was the outcome of the conflict?
4. In what way(s) could the conflict have been handled by any or all parties to result in a more desireable outcome?

Example 2

Suppose that you noticed a fire extinguisher on your ship with a worn and torn hose. Consider how you would have handled this potential hazard before learning the correct safety procedure.

How will you now handle this type of situation?

6.2 Review Items

Review items should be a comprehensive summary of all key information presented in the body of the RIO.

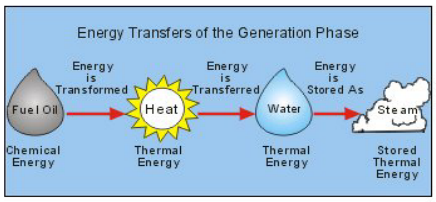
Guidelines for Review Items

1. Include all important information presented in the body of the RIO.
2. Contain stage tables, cycle-charts, flow-charts, procedure tables, decision tables, fact tables, combined tables, fact lists, graphics, or verbal summaries as appropriate.
3. Can include a printable form (PDF file) of the review item for further reinforcement and study.
4. Do **not** contain new information or information presented contrary to the context in which it is originally presented in the body of the RIO.

Example 1

The addition of thermal energy to liquid water results in the production of steam in the generation phase of the steam cycle.

Component	Function
Boiler	**1. Converts water into steam.** **2. Converts saturated steam into superheated steam.** **3. Includes: the water drum, generating tubes, steam drum, and superheater.**
THE FOLLOWING COMPONENTS ARE PARTS OF THE BOILER.	
Water drum	Stores water prior to steam generation.
Generating tubes	Produces Steam.
Steam drum	▪ Stores boiler water. ▪ Seperates steam from liquid water.
Superheater	Increases the amount of thermal energy in steam resulting in **superheated steam**.



Example 2

Review

Nikolaus Otto and Rudolf Diesel invented two different approaches to the internal-combustion engine still in use today.

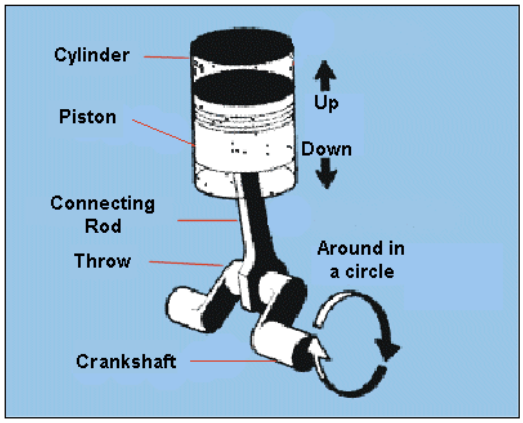
The following are characteristics common to all reciprocating internal-combustion engines.

They have four major parts:

- Cylinder
- Piston
- Connecting rod
- Crankshaft

They convert:

- Linear motion into rotary motion by means of a connecting rod and a crankshaft to perform useful work.
- Heat energy into mechanical energy.



7.0 RIO Content Items Count

RIO Content Items

Use the templates as guidelines to determine content items.

- Each RIO has different required and optional content items.
- Each content item will usually be presented on one screen for E-Learning content.
- Do not include the optional interaction and review items in RIO content item count.

Content Items per RIO Type

	Content Items	Required	Optional
Concept	4 - 10	Introduction Definition Example (at least 1) Practice Question(s)	Facts Non-Example Analogy Interaction(s) Review
Fact	4 - 9	Introduction Any combination of: Facts – Graphic Facts – List Facts - Table Practice Question(s)	Interaction(s) Review
Procedure	3 - 6	Introduction Any one table: Procedure Table Decision Table Combined Table Practice Question(s)	Facts Demonstration Interaction(s) Review
Process	3 - 5	Introduction Any one of: Staged Table Block Diagram Cycle Chart Practice Question(s)	Facts Interaction(s) Review
Principle	5 - 11	Introduction Principle Statement Guidelines Example(s) Practice Question(s)	Facts Non-Example Analogy Interaction(s) Review

Note: This table serves as a guideline. It is possible to have more content items than listed in the range, but not less.

8.0 RIO Content Item Naming Conventions

For E-Learning, the content item name is the same as the screen name. Use these conventions for naming content items:

- Content item names must be in title case with initial caps on important words and verbs.

Example	Removing the Bolt Carrier Assembly and Charging Handle
Non-Example	Removing the bolt carrier assembly and charging handle

- Fact items should not be labeled “Facts.” The content item (screen) name should describe the fact.

Example	LM2500 Gas Turbine Engine Model
Non-Example	Facts-Table

- The following content items should be named as such:
    - Introduction
    - Definition
    - Example
    - Non-Example
    - Analogy
    - Guidelines
    - Principle Statement
    - Demonstration

Example	Introduction
Non-Example	Introduction to Electronic Liquid Cooling Systems

9.0 Practice Items

Practice Item Levels

There are two levels of practice items:

1. Remember
2. Use (Apply)

Remember-level items test the learner's knowledge acquisition.

Use-level items test the learner's ability to use the information to assist with their performance of job tasks and are, therefore, preferable when job performance is the goal. Try to ensure that the large majority of your practice items are written to the use-level.

Guidelines for Practice Items

Each RIO will have a minimum of at least on practice item. When developing practice items, follow these guidelines.

All practice items must:

- Match the RIO learning objective.
- Use plausible distracters for incorrect alternatives.
- Prepare the learner for the final assessment.
- Assess content presented in RIO.
- Contain remediation for incorrect alts and feedback for correct alt(s).

9.1 Concept RIO Practice Item Guidelines

Remember Level

The learner should be able to identify the definition of the concept.

Example	Materials that can contaminate a food product or make it unsafe to eat are which type of hazard? 1. Biological 2. Chemical 3. Mechanical 4. Physical

Apply Level

The learner should be able to discriminate between examples and non-examples.

Examples	The contamination of food with items such as glass, metal, or bone particles represents what type of hazard? 1. Biological 2. Chemical 3. Mechanical 5. Physical ATC O'Brien became sick after he drank a liquid that he thought was lemonade. He later found out that someone had used the lemonade pitcher to store a cleaning solvent. What type of contamination did ATC O'Brien experience? 1. Biological 2. Chemical 3. Mechanical 4. Physical

9.2 Fact RIO Practice Item Guidelines

Important Note: Facts can only be assessed at the remember level.

Remember Level The learner is asked to identify pictures or specific objects. The learner is asked to recall features or specifications.

Example	Here the learner is asked to recall specifications of the layer's ranges. Match the atmospheric layers with the ranges. Ionosphere 31-250 miles Troposphere Earth's surface – 7.5 miles Stratosphere 7.5 – 31 miles

Remember Level Facts with Procedures For a deeper level of understanding, ask learners questions linked to the procedure or principle task requiring the prerequisite knowledge provided by the fact presented.

Example	The weather is getting bad. Thunderclouds are coming in from the west and your radio transmissions are picking up interference. What atmospheric layer will be affected by the weather conditions?

9.3 Procedure RIO Practice Item Guidelines

Remember Level

Have learner identify the proper steps in the procedure.

Example	Identify the steps to treat a patient with a rib fracture.

Apply Level

If the procedure is a mental performance, have the learner execute the procedure and select the correct answer.

Example	Calculate the circumference of a pipe with a radius of 5.45 centimeters and select the correct answer.

Scenario-based Questions

You can use scenario-based questions for a physical procedure. Write a scenario and ask a procedural question related to the situation.

Example	You have arrived on the scene of an accident and a person has been ejected from a vehicle. You have begun a rapid trauma assessment. You have just inspected and palpated the chest. What will you do next? ___ Assess breath sounds ___ Observe chest/neck ___ Obtain vital signs

Performance-based

If the procedure is a physical performance, and the method of instructional delivery is not E-Learning, then the most accurate assessment of the procedure is to evaluate the learner performing the procedure.

9.4 Process RIO Practice Item Guidelines

Remember Level

Ask the learner to identify the correct process stages.

Example	Identify the stages in the correct sequence.

Apply Level

The learner is given a scenario and asked what the next stage would be based upon the given circumstances.

Examples	The prototype widget has just been completed. Before it can be sent to assembly, what must happen next? The prototype widget has just been completed. What would happen if a flaw were discovered in the widget's design right out of assembly?

Job-related Tasks

Ask the learner to solve problems similar to ones faced while performing a certain job-related task.

Example	The widget is stalling just before it reaches the performance stage. Where could the problem be? From looking at the process display, where would most problems be expected to occur?

9.5 Principle RIO Practice Item Guidelines

Remember Level

Ask the learner to list the guidelines.

Example	List the guidelines for setting up cleaning gear lockers.

Apply Level

The learner is given a scenario and asked what the correct procedure would be based upon the given circumstances. Ask the learners to solve problems similar to ones they may encounter while performing a certain task.

Example	You have just transferred to a new job. When you see the cleaning gear locker for the first time, you are shocked. The cleaning material is stored with food items, and several principles have been ignored. What is the first thing you should do?

10.0 Remediation and Feedback Guidelines

Remediation Guidelines

Knowledge of results (right or wrong) is not adequate feedback for either incorrect or correct answers. To establish certain uniformity for practice items, remediation, and feedback, the following guidelines must be followed.

Do **not:**

- Repeat the same remediation for all alts.
- Use the correct answer as remediation for any incorrect alt.
- Give the correct answer when telling the learner why the answer was incorrect.

Remediation Samples for Incorrect Alts

Select one of the following remediation formats for each incorrect alt:

- **That is incorrect.** (Then state why it is incorrect.) **Try again.**
- **No**. (Then state why it is incorrect.) **Try again.**
- **Try again**. (Then state why it is incorrect.)
- **Remember the . . .** (This is an explanation of why the alt is wrong.) **Try again.**

Feedback Samples for Correct Alts

Feedback format can be any one of the following:

- **Bravo Zulu!** The first step in removing and replacing a flat tire is to raise the vehicle using the jack.
- **You are correct!** (Then state why it is correct.)
- **Correct answer**. (Then state why it is correct.)
- **You got it!** (Then state why it is correct.)
- **Yes!** (Then state why it is correct.)
- **Way to go!** (Then state why it is correct.)

11.0 Assessment Items

RIO Assessment Items

The purpose of assessment items is to determine if RIO content has been mastered.

Assessment items are presented at the RLO level in order to prescribe individual RIOs or to determine mastery of the content.

Assessments items can be found in the *Pretest* and *Quiz* sections of the RLO.

- The *Pretest* should be taken before the lesson.
- The *Quiz* must be taken during or at the end of the lesson.

Requirements

Assessment items are written at the RIO level.

All assessment items must:

- Match the learning objective of the RIO.
- Reflect the content in the RIO.
- Differ from the practice item(s).
- Differ between *Pretest* and *Quiz* items.

Options

Items may contain graphic media.

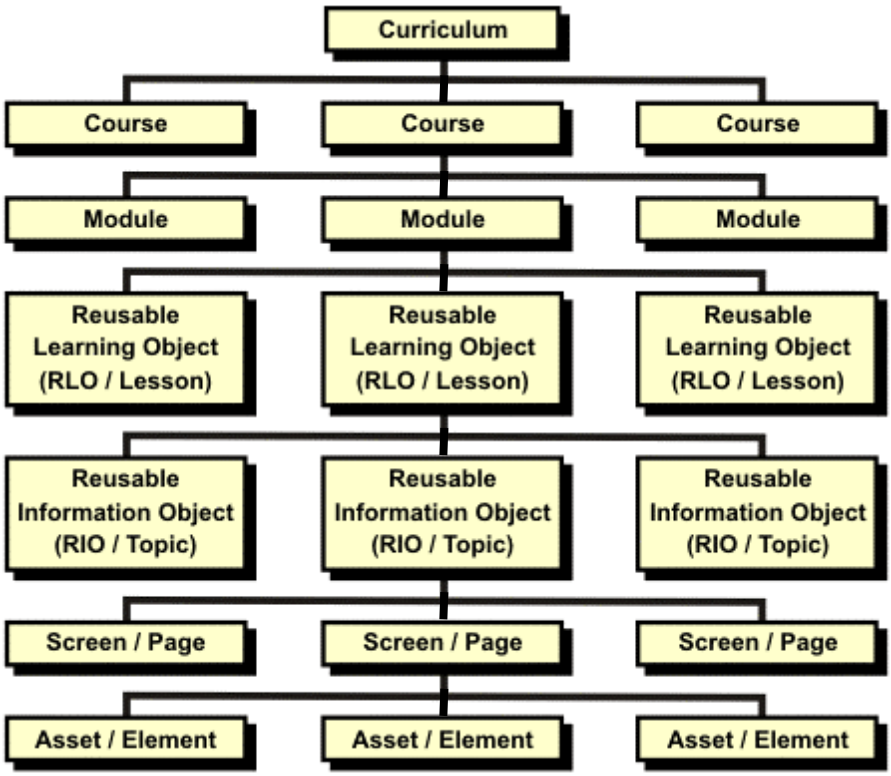
Guidelines

You can use the practice item guidelines to develop the assessment items.

12.0 Learning Object Taxonomy

Taxonomy

Learning objects are standalone units of instruction. However, if a content developer has a requirement to build a course or curriculum, the following taxonomy is to be used:



13.0 Learning Objectives

What Is a Learning Objective?

Learning Objectives (LOs) state what the learner should know or be able to do after completing the instructional module.

One main (terminal) learning objective is developed for each RLO, and one supporting (enabling) learning objective is developed for each RIO.

All RIO objectives should work together to achieve the main RLO objective.

Purpose of LOs

The LOs have different purposes for the learner and the developer.

Learner	Developer
1. Explains what learner will learn or be able to do after instruction.	1. Focuses development of instructional content. 2. Guides development of assessment items.

Performance- vs. Knowledge-based Instruction

In developing RLOs, we need to make a distinction between "performance-based" instruction and "knowledge-based" instruction.

Performance	Knowledge
A learning activity whose result can be observed; that is, the instructor can witness the student doing or "performing" the skill taught.	A learning activity in which results cannot by observed because it is not a physical action; that is, the student is learning new subject matter, but the instructor cannot actually witness the learning taking place.

Performance Examined

To get a better understanding of this concept, let's examine the following scenario.

A Seabee needs to know how to make an accurate 90º cut on a 2x4. After explaining and demonstrating the procedure, it would be easy for the instructor to observe the student performing the correct procedure:

1. Put the 2x4 on a pair of saw horses.
2. Measure and mark the location of the cut on the 2x4.
3. Lay the speed square on the 2x4 as a guide for the circular saw.
4. Plug the circular saw into an electrical cord.
5. Put on safety glasses.
6. Align the saw blade on the "waste" side of the mark.
7. Adjust and hold the speed square to the saw footplate at a 90º guide.
8. Depress the switch on the saw.
9. Make the cut.

Performance Assessed

The instructor could then assess the student's performance using a measuring tape and a square to ensure the student performed according to the established criteria.

By his performance, the student has demonstrated that he knows and can perform the steps of the procedure in the right sequence, accurately, and safely.

Knowledge Assessed

What if you were trying to teach this same “procedure” using only the computer for E-Learning instruction? How do you convert this “performance-based” lesson into a “knowledge-based” lesson?

In our example above, the instructor can determine that the student has all of the knowledge to perform each of the steps correctly by personally observing the student’s performance. Not so with E-Learning instruction. The best we can hope for, using this medium, is to be able to teach and assess the “knowledge” part of the “performance-based” instruction.

Making the cut is the “performance-based” component. The student knows **how** to perform the procedure.

However, before the student knows how to do something, the student must know **what** to do. Knowing what must be done to perform a task is the “knowledge-based” component.

This is the distinction between what we call “performance-based” instruction and “knowledge-based” instruction.

Consequently, when existing content must be repurposed or re-engineered for E-Learning, any performance-based learning objectives will have to be modified using terminology (action verbs), which reflect E-Learning instruction and assessment.

13.1 Three Parts of the Performance Learning Objective

Objective Component	Definition	Example
Condition	Conditions under which performance must occur; tools and information provided to perform the task.	1. Given a calculator and the height and width measurements, 2. Given the proper tools,
Behavior	An action statement of what must be performed.	1. calculate the surface area of a square 2. make a 90º cut on a 2x4 piece of wood
Standard	Measurable criterion; degree of accuracy and/or speed of performance.	1. correctly. 2. within 98% accuracy.

When the examples are pieced together, they form complete learning objectives.

> Given a calculator and the height and width measurements, calculate the surface area of a square correctly.
>
> Given the proper tools, make a 90º cut on a 2x4 piece of wood within 98% accuracy.

13.2 Three Parts of the Knowledge Learning Objective

Objective Component	Definition	Example
Condition	How task must be done; for E-Learning it is implied it will be performed using a computer.	Given a list of the individual components of an M-16,
Behavior	An action statement of what must be performed.	select the components for reassembly
Standard	Measurable criterion; implied 100% for E-Learning.	in their proper order.

Note: Learning objectives written for E-Learning content do not need to include the condition and the standard because they are already implied. See the following examples.

Examples of Knowledge-based LOs

Identify the responsibilities of flight deck personnel wearing blue jerseys.

Select the operation of an axial piston pump from the options given.

Order the steps required in filling out a time sheet.

Guidelines Follow the guidelines below when converting a performance-based learning objective into a knowledge-based learning objective.

- ✓ Review the performance objective.
- ✓ Determine the task in the objective.
- ✓ List the steps involved to perform the task in the objective.
- ✓ Determine the knowledge needed to perform the steps to complete the task.

- ✓ Analyze the main objective verb.
- ✓ Determine the desired outcome of the E-Learning instruction.
- ✓ Review list of knowledge verbs for E-Learning.
- ✓ Convert performance verb into a knowledge verb.

Terminology For E-Learning content, using the following terminology:

"After completing this topic, you will be able to …"

Verb Table The verbs listed in the following tables are suggested for learning objectives.

There are other verbs that can be used that are not listed in this table.

Shaded areas represent actions that can be measured through E-Learning assessments.

Verb	General	E-Learning
Describe	X	
Summarize	X	
Match	X	X
List	X	X
State	X	
Label	X	X
Differentiate	X	X
Identify	X	X
Classify	X	X
Select	X	X
Convert	X	X

14.0 Formatting Principles

Why Are There Standards?

Reusability is one of the greatest benefits of the RLO model. It allows various developers to use material that other people have built or created. If developers use different styles, then reusability will not be seamless and there will be variations in the appearance and instructional quality of the materials. Therefore, it is necessary to follow the conventions set forth in this document.

The list conventions that have been covered in this document are referenced in *The Gregg Reference Manual* and will supersede *United States Government Printing Office Style Manual* for purposes of RLO development.

Use the following guidelines for all content development.

For additional conventions not covered in this document, refer to the *United States Government Printing Office Style Manual*.

14.1 Acronyms

The first time a phrase is used, it is spelled out followed by its acronym in parentheses. This should be done in each RIO since RIOs are designed to be standalone.

Example	This section addresses the Intelligence Shared Data Server (ISDS). The ISDS is important because it stores intelligence data.
Non-Example	This section addresses the ISDS. The ISDS is the Intelligence Shared Data Server.

Include *a*, *an*, or *the* before the acronym if it is common usage to do so. Choose *a* or *an* depending on how the acronym is pronounced.

Examples	• an HTML file… • an RLO… (pronounced *are-low*) • a RIO…(pronounced *ree-oh*)
Non-Example	• a HTML file

Do **not** use an apostrophe with plural acronyms.

Example	The center COs will meet next week.
Non-Example	All the CO's will travel to Pensacola.

14.2 Directional Text for E-Learning Content

When giving the learner directions on the screen, use the following terminology in the given situations.

Animation "To view the animation, click the Play button on the media player."

Video "To view the video, click the Play button on the media player."

Roll-overs "Using your mouse, roll over …"

"Using your mouse, move the pointer over the ____ to _____."

Forms "To view the form, click on the Form icon."

14.3 Font Conventions

The following font conventions must be used when developing the RIOs.

Emphasis

Use bold text.

Example	Do **not** feed the bears.
Non-Examples	Do NOT feed the bears. Do <u>not</u> feed the bears.

Ship Name

Precede the first occurrence with USS (not in italic). Spell out the full name of the ship using italic. Include the hull number in parentheses, without a hyphen.

If the ship has a shortened name, you can use it without the hull number in all subsequent occurrences.

Example	USS *Theodore Roosevelt* (CVN 71) was very costly to build.
Non-Examples	The *USS Theodore Roosevelt* was very costly to build. The USS Theodore Roosevelt was very costly to build.

Word Used as Itself

Use italicized text.

Example	The term *widget* can be used to describe many things.
Non-Example	The term “widget” can be used to describe many things.

14.4 Lists

Lists help the learner identify the important concepts.

Lists add emphasis to key ideas by making them stand out against the surrounding text.

To help learners find and understand information, break down complex statements into lists.

List Standards

Use lists under the following conditions:

- The items are the main focus of the material.
- There are at least two or more items.

Use parallel structure in the list items.

Example	The MPA is responsible for the following duties: ▪ Operation of the ship's main engines, propulsion boilers, and assigned auxiliaries ▪ Inspection of ship's main propulsion plants
Non-Example	The MPA is responsible for the following duties: ▪ Operating the ship's main engines, propulsion boilers, and assigned auxiliaries ▪ Inspection of ship's main propulsion plants

Order the list in one of these ways:

- Sequential
- Importance
- Appearance
- Alphabetical, if the above cases do not apply

Punctuate the list items correctly:

- Use periods after each dependent clause that can be combined with the introductory statement to make a complete sentence.
- Use a colon after the introductory clause.
- Capitalize the first letter of the list item.

Example	Heat exchangers: • Are components of cooling systems. • Regulate the temperature. • Require regular maintenance.
Non-Example	Heat exchangers • are components of cooling systems; • regulate the temperature; and • require regular maintenance.

- If the list items are complete sentences, begin with a capital letter and include end punctuation.

Example	Follow these guidelines during RLO development: • Use the RIO templates. • Ensure information is current. • Review with subject matter expert.
Non-Example	Follow these guidelines during RLO development: • use the RIO templates • ensure information is current • review with subject matter expert

- If the list items begin with a fragment followed by a complete sentence, begin with a capital letter and include end punctuation.

Example	The ADDIE Model contains five phases: • Analysis. This is where the need is discovered. • Design. This is where the training is designed. • Development. Here the training is produced. • Implementation. Then the training is delivered. • Evaluation. The final testing takes place here.
Non-Example	The ADDIE Model contains five phases: • analysis: this is where the need is discovered • design: this is where the training is designed • development: Here the training is produced. • implementation: Then the training is delivered. • evaluation. The final testing takes place here.

- If the list items are like those on a checklist or inventory sheet, begin with a capital letter and omit end punctuation.

Example	Please include the following supplies in the order: • Paperclips • Pencils • Copy paper
Non-Example	Please include the following supplies in the order: • paperclips • pencils • copy paper

Make lists easy to read with line spacing:

- If list items fit on two lines or more, then leave a line space between the list items.

Example	The Electrical Officer is responsible for the following: ▪ Operation, care, and maintenance of the ship's electric power generators and distribution systems ▪ Interior communications systems, gyrocompass systems, degaussing systems, dead reckoning analyzer, small boat electrical systems, lighting circuits, and motor controllers
Non-Example	The Electrical Officer is responsible for the following: • operation, care, and maintenance of the ship's electric power generators and distribution systems • interior communications systems, gyrocompass systems, degaussing systems, dead reckoning analyzer, small boat electrical systems, lighting circuits, and motor controllers

- If list items fit on one line, then do **not** leave a line space between the list items.

Example	Please include the following supplies in the order: • Paperclips • Pencils • Copy paper
Non-Example	Please include the following supplies in the order: • Paperclips • Pencils • Copy paper

Bulleted List

- Precede list items by a bullet, each on its own line.
- Use if there are more than four items in the list.
- May use for fewer than four items, but more than one.
- Begin with a capital letter.

Numbered List

- Precede list items by a number and a period.
- Use if list items have a sequential order.
- Use if list items have a priority or importance level that is denoted by the numbers.
- Begin with a capital letter.

Lettered List

- Precede list items by a capital letter and a period.
- Use if list items meet any one of the following circumstances:
    - There is no sequential order, but learners need a reference.
    - There are more than nine list items that cannot be broken into separate lists.
- Begin with a capital letter.

Definition List

- Follow list items by their corresponding simple definition.
- Number or letter list items depending on content.
- Begin each term with a capital letter.
- Use if each list item describes one term.
- End definition with a period.

Example	• Novice – no experience. • Learner – minimum experience. • Expert – extensive experience.
Non-Example	• novice – one who begins and has absolutely no experience in the given field • learner – one who has minimum experience, but requires constant guidance and supervision under most circumstances • expert – one who has had extensive experience in the given field and often serves as a mentor and teacher to novices

14.5 Tables

Use the following guidelines when developing tables:

- Separate text or graphics that come directly before or after a table with one blank line. For tables in HTML, place a **<p/>** between the text or graphics and the table.
- Bold headings in tables.
- Add cell margins for print-based material or cell padding for HTML-coded tables. See following examples.

Non-Example

In this table cell the margins are as follows:	
Top: 0” Bottom: 0”	Left: 0” Right: 0”

Example

In this table cell the margins are as follows:	
Top: 0.08” Bottom: 0.08”	Left: 0.08” Right: 0.08”

HTML Tables Use the following table settings when coding in HTML:

Maximum width (all columns)	=	600 px
Maximum width (all columns - menu collapsed)	=	725 px
Cell padding	=	4
Border (color)	=	1 (black) or 0 (none)
Cell spacing	=	0
TD valign (header row)	=	center
TD align (header row)	=	center

15.0 Iconology

Use the following conventions when developing content that contains dangers, cautions, and warnings.

15.1 Danger

The danger marking is used to indicate a location, equipment, system, or the ship where imminent hazard exists capable of producing immediate injury or death to personnel or threatens the primary mission of the ship.

Danger Table Guidelines

Follow these guidelines when creating danger tables:

- Use a red background with white, bolded font for all dangers.
- Replace “This is a danger” with your text.
- Use the HTML code provided below to create a danger table.

HTML Code for Danger Table

```
<table border="2" cellspacing="0" cellpadding="3" width="202"
bordercolor="#000000">
  <tr bgcolor="#FF0000">
    <td>
      <p align="center"><b><font color="#FFFFFF">DANGER! <br>
        </font></b><font color="#FFFFFF"><b>This is a
danger.</b></font></p>
      </td>
  </tr>
</table>
```

15.2 Warning

The warning marking is used to indicate a location, equipment, system, or the ship where a potential hazard exists capable of producing injury to personnel if approved procedures are not followed.

Warning Table Guidelines

Follow these guidelines when creating warning tables:

- Use a red background with white, bolded font for all warnings.
- Replace “This is a warning” with your text.
- Use the HTML code provided below to create a warning table.

HTML Code for Warning Table

```
<table border="2" cellspacing="0" cellpadding="3" width="202"
bordercolor="#000000">
  <tr bgcolor="#FF0000">
    <td>
      <p align="center"><b><font color="#FFFFFF">WARNING! <br>
        </font></b><font color="#FFFFFF"><b>This is a
warning.</b></font></p>
      </td>
  </tr>
</table>
```

15.3 Caution

The caution marking is used to indicate where a hazard exists that could severely damage equipment, system, or the ship causing loss of mission capability if approved procedures are not followed.

Caution Table Guidelines

Follow these guidelines when creating caution tables:

- Use a yellow background with black, bolded font for all cautions.
- Replace “This is a caution” with your text.
- Use the HTML code provided below to create a caution table.

HTML Code for Caution Table

```
<table border="2" cellspacing="0" cellpadding="3" width="202"
bordercolor="#000000">
  <tr bgcolor="#FFFF00">
    <td>
      <p align="center"><b><font color="#000000">CAUTION! <br>
        </font></b><font color="#000000"><b>This is a
caution.</b></font></p>
      </td>
  </tr>
</table>
```

16.0 Additional Resources for RLOs

Additional Resources

The following is a list of resources that provides background information on the RLO Model:

Cisco Systems Inc., *Reusable Learning Object Strategy: Definition, Creation Process, and Guidelines for Building*, version 3.1, October 2000, Online: [http://www.cisco.com/warp/public/10/wwtraining/elearning/implement/rlo_strategy.pdf]

Clark, R.C., *Developing Technical Training: A Structured Approach for the Development of Classroom and Computer-Based Instructional Materials,* Performance Technology Press, 1999.

Clark, R.C. & Mayer, R.E., *E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning,* Jossey-Bass Pfeiffer, 2002.

Navy Reusable Learning Object (RLO) Development Process, Naval Education and Training Professional Development and Training Center, Pensacola, FL, February 2003.

The Gregg Reference Manual, Ninth ed. Glencoe/McGraw-Hill, New York, NY, 2001.

United States Government Printing Office Style Manual, United States Government Printing Office, Washington, DC, 2000.

Appendix A

This table explains the relationships among the various terminology used in curricula development.

Learning Objects (E-Learning)	**Resident Curricula**	**Print Analogy**	**Tech Manuals**	**OutStart Hierarchy**	**NMETL/ TBA**
Curriculum	Curriculum	Series	Manual		Job
Course	Course	Book	Section	Course	
Module	Module	Chapter/Story	Chapter	Module	Duty
RLO/Lesson	TO – Terminal Objective	Lesson	*Paragraph	Learning Object	Task
RIO/Topic	EO – Enabling Objective	Topic	*Sub Para	Topic	
Screens/Content Items	DP – Discussion Point	Page		Group	
Assets/Elements (text and media)	Text and Media	Text and Media	Text and Media	Elements	