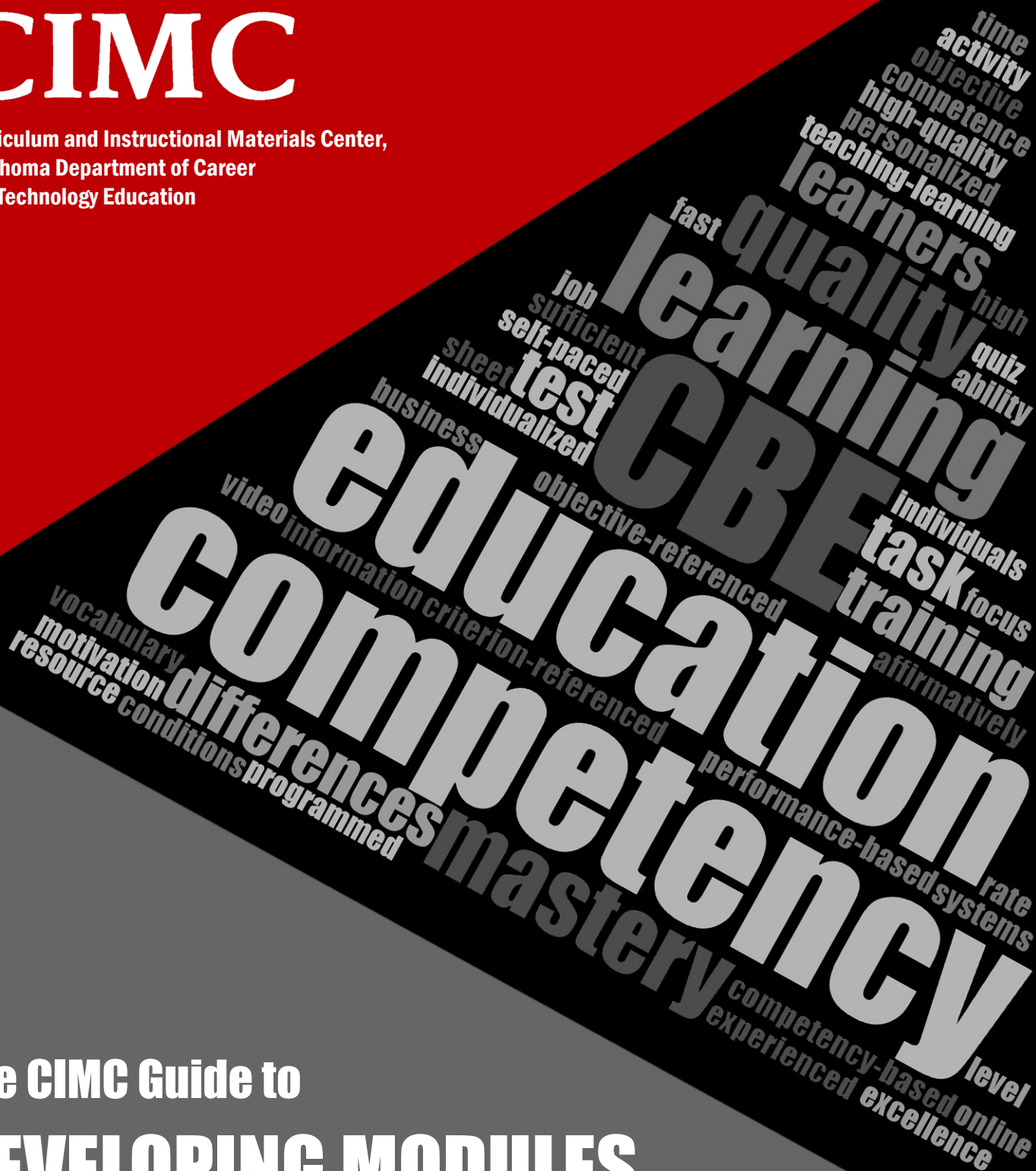# CIMC

**Curriculum and Instructional Materials Center,
Oklahoma Department of Career
and Technology Education**

The CIMC Guide to

DEVELOPING MODULES
FOR SELF-PACED LEARNING

A Handbook for Teachers

Not even ten years after…the CIMC opened its doors, Oklahoma already had established its primacy as a national resource for curriculum and instructional materials. That meant a lot—and a lot more than just prestige. It made Oklahoma a major player in a billion-dollar-a-year business and a major influence where occupational training was presented anywhere by anybody.

—**Danney Goble**, author and historian,
from *Learning to Earn: A History of Career
and Technology Education in Oklahoma* (2004)

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DEVELOPING MODULES FOR SELF-PACED LEARNING

A Handbook for Teachers

Compiled by:
Craig A. Maile and Margi Stone Cooper, Ph.D.

CIMC

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A Division of the Oklahoma Department of Career and Technology Education
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career **tech**

Oklahoma Department of Career and Technology Education
Curriculum and Instructional Materials Center

Printed in the United States of America by the
Oklahoma Department of Career and Technology Education
Stillwater, Oklahoma 74074-4364

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Credits

Craig Maile has worked as a technical writer, curriculum specialist, and curriculum manager at the Oklahoma Department of Career and Technology Education for over 30 years. He has a B.A. in technical communication and an M.S. in occupational and adult education, both from Oklahoma State University.

Margi Stone Cooper has many years of experience as a curriculum developer and online learning coordinator in industry and in career and technology education. She has a Ph.D. in educational technology, along with a graduate certificate in online instruction, from Oklahoma State University.

The Curriculum and Instructional Materials Center (CIMC) is a division of the Oklahoma Department of Career and Technology Education. The CIMC has existed since 1967 to produce competency-based instructional materials for career and technical (formerly vocational) education. The Oklahoma Department of Career and Technology Education is a state education agency that also produces, prints, and distributes curriculum materials across Oklahoma and throughout the United States. The CIMC is located in Stillwater, Oklahoma.

Acknowledgements

Purpose of This Publication

This handbook offers a framework for teachers who develop self-paced learning modules for their CareerTech courses. Within that framework, this handbook also provides insights based on the expertise of the staff of the Curriculum and Instructional Materials Center (CIMC), a division of the Oklahoma Department of Career and Technology Education, as well as other select authorities. The modules upon which this guide focuses may be in digital or print form.

Before Getting Started

Syllabus

Instructors should prepare a syllabus before attempting to design a course or learning module. A syllabus provides a "road map" or framework for the planning and development of content. For learners, the syllabus sets the tone for the course. By reading the syllabus, learners can better understand what to expect from the course—and what the instructor expects from them in return.

A syllabus also functions as a contract among the instructor, the school or agency, and the learner. It ensures that the instructor holds all learners to the same standards. Thus, this document must make these terms clear.

A course syllabus often includes the following types of information:

- Instructor contact information and office hours.

- Description of the course.

- Required textbooks or other resources.

- Technology requirements.

- Learning objectives.

- School or agency policies about academic honesty, attendance, and expected learner behavior and participation.

- Description of class assignments.

- Weekly schedule or calendar of activities, along with assignment deadlines and testing dates.

- Method of grading, grading scales, rubrics, and policies concerning the submission of late assignments.
- Methods for communicating with the instructor and other learners.
- Emergency and safety procedures.

Many schools have specific requirements or templates for creating a course syllabus. Check with your principal or program leader for guidance to ensure your syllabus meets any established criteria.

Note: See the sample syllabus in the appendix.

Subject Matter Experts

Before developing original learning modules, instructional designers often seek input from subject matter experts (SMEs). Educational materials must be technically accurate, comprehensive, and relevant to the needs of potential employers and learners. Identifying qualified reviewers ensures you have contacts who can answer any technical questions that arise during the development process.

When considering possible SMEs, make sure you choose peers and industry specialists who have the time to provide a thorough review, and who can respond to your request for input within the necessary timeframe. Most importantly, choose SMEs who will provide honest feedback. Constructive criticism only helps to improve your credibility and the educational integrity of the instructional materials you develop.

Module 1
Describing Modules for Self-Paced Learning

Objectives

1. Identify key elements of competency-based education.
2. List advantages of CBE.
3. Define a self-paced learning module.
4. State benefits to learners and instructors of self-paced learning modules.
5. Recognize components of self-paced learning modules according to their functions.
6. Decide when a component is required.
7. State reasons for adapting or revising instructional content.
8. Identify considerations for organizing [sequencing and indexing] modules.
9. List useful resources for creating self-paced learning modules.
10. Explain accessibility, usability, and universal design for learning.
11. List guidelines for developing or using video.
12. List guidelines for taking your own photos using a smartphone.
13. Describe benefits of digital learning.
14. Explain copyright and fair use guidelines for educators.
15. Complete the Initial Planning Checklist.

1: Key Elements of Competency-Based Education (CBE)

Competency-based education, or CBE, has many names. It may be called mastery learning, competency-based instruction, systems approach to education, personalized system of instruction, performance-based instruction, criterion-referenced instruction, mastery learning, objective-referenced learning, individualized instruction, programmed instruction, or self-paced learning.

In CBE, any learner can master most any task at a high level of mastery if provided with high-quality instruction and sufficient time. Rather than being fast or slow learners, or good or poor learners, most individuals become very similar to one another in learning ability, rate of learning, and motivation for further learning when provided with favorable learning conditions. In CBE, the focus should be more on differences in learning and less on differences in learners.

The most important element in the CBE teaching-learning process is the kind and quality of instruction experienced by learners. Every task, every objective, every test or quiz item, every video, every module, and every instruction sheet should pass this test: Will this training activity

or learning resource contribute to competence on the job? If we cannot answer affirmatively, we have no business including it in our training program.

Another way to think about CBE is to compare it to the "traditional" approach to learning:

Table 1
Competency-Based Education (CBE) Compared to Traditional Learning

In CBE	In "Traditional" Learning
• You will learn X.	• We will be here for 18 weeks.
• This is X.	• This is X.
• When you are ready, try to perform X. If you do not perform well, try again or try an alternative presentation about X, then try again.	• On a certain day and time, all of us will perform X.
• If you perform well, move on to Y.	• Once everyone has performed X, we will all move on to Y.
• This is Y.	• This is Y.

Regardless of its name, CBE should have the following key elements:

■ **Based on measurable and observable objectives**

Learning objectives drive CBE. Objectives are the "competencies" that learners must achieve. Each objective must clearly state what *learners* must *do* to demonstrate acquired skill or knowledge. Verbs in learning objectives are active and precise, stating the exact performance expected of learners. The objectives should also specify the standard or level of performance required. Objectives can be at any level of Bloom's Taxonomy and can include the cognitive, psychomotor, and affective domains. Higher-order cognitive skills should be included.

■ **Instruction aligned with objectives**

In CBE, the objectives specify what learners must learn. "Content" should relate to one or more objectives. The curriculum should cover all objectives with relevant information.

■ **Criterion-referenced evaluation system aligned to objectives**

A learner evaluation system must exist that is: 1) criterion-referenced, and 2) aligned to the learning objectives and the curriculum. In CBE, the aim is to bring the performance of all learners up to pre-defined standards and competencies. Learners work on each competency until they achieve mastery; the evaluation system should test and record this mastery. Learners can restudy and retest as often as needed. Specific remediation activities should also be available to learners when needed. The evaluation system focuses on what each learner has achieved, not on what the instructor has taught. The constant in CBE is learner

performance; the variables are time and resources. (This differs from traditional systems where learners get one chance at mastery; some succeed and some fail. In such systems, time and resources are constant and learner achievement is variable.)

If an evaluation is criterion-referenced, successful learner performance is defined by (or referenced to) mastery of pre-set objectives and standards (or criteria). There must be a careful match (or alignment) between what the learner should master (objectives), what is taught (curriculum), and what is tested. Objectives, curriculum, and evaluation system must all match.

■ **System to manage cognitive skills and psychomotor ("hands-on") skills**

The *cognitive* domain—also referred to as Bloom's Taxonomy of Learning Domains—deals with recall or recognition of knowledge and the development of intellectual abilities and skills (knowing). The *psychomotor* domain deals with the physical responses of the learner and the development of manipulative skills (doing).

Note: The *affective* domain deals with changes in interest, attitudes, and values and the development of appreciations and adequate adjustment (feeling).

For both cognitive and psychomotor skills, a CBE program must have a system of maintaining records of which skills and activities each learner has completed, which ones are in progress, and which ones await completion. Completion means "mastery"—no skill is completed until the learner has achieved the mastery level.

The record system should promote feedback on learner skill attainment to *both* the instructor and learners, provide for remediation as needed, and encourage re-evaluation of learner performance until the learner achieves mastery. Appropriate remediation strategies often should consider individual differences among learners.

Learners should work on skills and activities until they achieve mastery. They should not be "passed on" without mastery. While learners may move ahead and work on other skills (i.e., skills for which all prerequisites have been mastered or those without prerequisites), work should also continue on the skills still requiring mastery. Learners should not attempt higher-order skills until they master all prerequisite skills.

■ **Mastery records maintained for each learner**

Records should clearly indicate the skills each learner has mastered. One such record should profile or list the competencies that the learner has mastered and those still awaiting mastery. A portfolio for each learner can include these and other performance indicators. Learners should have ready access to their portfolios to track their own progress in skill mastery and competency attainment. Online learning systems and digital portfolios can automate the job of maintaining mastery records for each learner.

The table below condenses the key elements of CBE into a reference tool for developing or organizing a curriculum.

Table 2
A Recipe for Achievement Using Competency-Based Instruction

Standards* (Measures)	+	Tasks/Skills (Do)	+	Knowledge & Attitudes (Know & How)	+	Assessments & Evaluations (Evidence)
• National • State • Industry • Association • Agency • Commission or Council • Other		• Workplace Relevant • Career Relevant • Life Relevant		• Task-Enabling • Supporting • Safety • Ethics • Customer Service • Interpersonal/Relating • Critical Thinking • Problem Solving • Decision Making • Grit/Perseverance • Creativity • Rules and Regulations • Quality		• Practice and Feedback • Performance Tests • Written/Cognitive Tests • Quizzes • Self-Checks • Rubrics (project/activity) • Portfolios • Profile of Training Mastery (competency profile)
←		**Instructional Delivery and Learner Feedback** (instructor-led, self-directed, online, blended)				→

*Usually stated as objectives or competencies.

2: Advantages of CBE

Competency-based education offers several advantages:

- Allows the learner to advance at his/her own pace within the program guidelines.
- Allows the teacher to function as a guide and resource person.
- Promotes action-oriented instruction.
- Provides for a more efficient use of facilities and equipment.
- Gives learners credit for their prior knowledge.
- Provides for greater learner accountability.
- Facilitates site-based management.
- Allows for program articulation based on identified objectives.
- Communicates to employers about learners' skill development in workplace-relevant terms (competencies).

3: Definition of a Self-Paced Learning Module

A self-paced learning module is an orderly set of instructions designed to facilitate the learner's mastery of a body of knowledge or a procedure. When combined with other modules, learners can master a comprehensive body of knowledge or a complex process.

A self-paced learning module can be in digital or print form. For example, the digital modules or lessons offered via a school's learning management system (LMS) are examples of self-paced learning modules. In the days before digital learning, a paper-based form of the self-paced learning module was the learning activity packet, or LAP.

Learners will realize the benefits of competency-based education, whether they use digital or print self-paced learning modules. In fact, the paper-based form is a convenient step for teachers to take along the road to digital delivery. Once the paper-based modules are developed, used, and improved, they can become the blueprint for a digital equivalent such as an online course.

Self-paced learning modules are useful for more than one purpose. For example, they can facilitate learning for individualized or self-paced instruction. They can also supplement traditional instruction in order to provide more thorough and/or additional training.

To be most effective, self-paced learning modules should have certain characteristics. These include:

- **Logical (sequence)**—the steps reflect occupational steps, prerequisite knowledge and abilities, and difficulty.

- **Self-contained**—learners can pick up (or access) the module and begin work without instructor intervention, and can proceed through the module based on clear instructions about what to do in all likely situations, including what to do at the end of the module.

- **Comprehensive**—the module includes, or references, all of the content that is relevant to the learning objectives or competencies.

- **Cohesive**—the module content is well integrated and contributes to the learner's mastery of the competencies within a reasonable time.

Self-paced learning modules can be *comprehensive*—including all of the objective content, activities, and assessments needed for the learner to complete the module independently. This is often the case when a new teacher creates his/her own CBE curriculum. The teacher pulls all of the content together in one place (or even writes the content from scratch). All of the modules that the learner needs are in one place, whether online or on paper.

Another version of a self-paced learning module is the *simple* or *framework* version. This version provides more of a guide as the learner uses a range of existing resources, such as digital or print textbooks and workbooks, service manuals, websites, videos, lab and diagnostic equipment, and other learning resources. This kind of self-paced learning module is effective when a set of diverse learning resources is already available, but those resources require organization in a sequence that facilitates learning and skill mastery.

4: Benefits of CBE

Competency-based education offers many benefits for teachers and learners:

- Design provides for quality control of instruction. All learners receive the same information.

- Design is compatible with competency-based education and usable in an open entry/open exit system.

- Both learner and teacher know exactly what is to be learned and at what level of proficiency.

- Teachers can monitor learner progress more closely.

- Design allows for better use of instructor time. The instructor has more time to work with individual learners, answer questions, provide feedback, and evaluate learner performance.

- The pace is not too slow for some or too fast for others—it is just right for all.

- Allows learners to perform without risk to their self-esteem from comparison to their peers.

- Allows and encourages deeper study.

- Learners can see concrete measures of progress. At the end of the self-paced learning module, learners are able to do something they could not do before or know something they did not know before. This provides motivation to continue learning.

- As content changes, the teacher can easily update an individual module.

- Performance evaluation reflects individual learner performance measured against a set standard. The performance of other learners is not a factor.

- Learners develop time management and study skills, self-discipline, and self-direction.

- Each learner can work at his/her own pace while working toward mastery.

- Learning activities can vary to allow for differences in learner skill levels and learning preferences, providing a method of individualizing instruction.

5: Common Components of Self-Paced Learning Modules

Most self-paced learning modules have components or features that serve specific functions. This is true whether the modules are in print or digital form. Below are some of the most common components.

■ **Cover Sheet (Objective Sheet)**—Identifies the module; lists prerequisites, approximate completion time, and other identification information. May also include a rationale (context) for the module (why learn this content?) and criteria for successful completion. Functions as the "table of contents" for the module. States the performance(s) required of the learner in order to complete the module.

■ **Vocabulary List**—Lists and defines all of the key words and short phrases that appear in the module.

■ **Learning Plan**—Gives the learner step-by-step instructions for working through the module and using supplemental resources. Serves as a checklist to help the learner track his/her progress. References external resources to supplement module content (website addresses, related LMS course modules, video titles, and other resources).

Example:

1. Check the box as you complete each step.
2. Study the information sheet for objective 1.
3. Study the information sheet for objective 2.
4. Look at an actual charging system with an internal voltage regulator as your instructor points out the parts on the engine.
5. Study the information sheet for objective 3.
6. Study the information sheet for objective 4.
7. Study the introduction to the assignment.
8. Review the supplement, "Charging System Diagnosis Chart."
9. Do the assignment.
10. Stop and have your instructor evaluate your work from the assignment. After your instructor has evaluated your work, follow your instructor's recommendations.
11. Look at actual drive belts.
12. Ask your instructor to demonstrate the guidelines and procedures in Job Sheet 1. Use the job sheet to follow along. Pay careful attention to any guidelines, cautions, and warnings.
13. Practice the procedure demonstrated by your instructor. Use the job sheet as a guide. Notify your instructor when you are ready to perform the procedures for evaluation.
14. Stop and have your instructor evaluate your work from the job sheet. After your instructor has evaluated your work, follow your instructor's recommendations.

- **Pretest**—Evaluates learner's knowledge and skills prior to starting the module. The pretest may yield a score for granting credit for the module, indicate specific topics to study in depth, and—when compared to the posttest—indicate the effectiveness of the instruction. (See posttest.)

- **Information Sheet**—Contains information necessary for the learner to meet the objectives. In a simple or framework module, the "information" will exist in external resources to which the learning plan refers.

- **Assignments**—Provides activities designed to correspond to specific objectives and that reinforce the information provided in texts, websites, videos, etc. Assignments often require higher-level skills such as diagnosis and problem solving. They provide an opportunity for skill practice without risking the learner's health or safety. Answers or rubrics can provide immediate learner feedback.

  Examples:

  o   Respond to scenarios involving fire safety.
  o   Calculate medication dosages.
  o   Reduce fractions to lowest terms.
  o   Select operating positions for service valves.

- **Job/Procedure Sheet**—Provides the steps and criteria for objective evaluation of a procedure and its resulting product. Artwork and multimedia resources can illustrate specific steps.

  Examples:

  o   Construct edge forms on grade for a slab without foundation.
  o   Properly lift an object.
  o   Prepare and evaluate pie crust.
  o   Perform sensory evaluation of air conditioning and refrigeration systems.

- **Posttest**—Measures learner's knowledge after completing the module. Results from both the pretest and posttest can indicate the effectiveness of the instruction contained in the module. If measuring the performance of a skill, use the job/procedure sheet. Online learning management systems often include capabilities for creating online assessments that can be immediately scored and reported to the instructor.

- **Answer Sheet**—For instructor use; provides the key for all of the assignments and other activities in a module.

Table 3
Ways CBE Creates Successful Learning Environments

Events for a Successful Learning Experience	How Self-Paced Learning Modules or CBE Address the Event
Inform the learner about what is to be learned	The module cover page or objective sheet tells learners what they will learn.
Motivate the learner to want to learn	The module introduction provides a compelling context for the content in the module. A well-written introduction explains the lifetime or workplace relevance of the content, or why the content is important for the learner to master.
Teach, or help with the recall of, prerequisite learning needed for mastery	The module cover page or objective sheet identifies any required prerequisites. Resources referenced in the module learning plan help to review and reinforce needed background knowledge or skills.
Provide guidance and structure throughout the learning process	The module learning plan provides a framework for the learner's progress toward mastery. The learning plan tells the learner what to do, when to do it, and with what resources. (The learning plan can also suggest appropriate alternatives.)
Present instruction appropriate for the task and in units small enough to promote efficient learning	Self-paced learning modules are organized around discrete "chunks" of skills and related knowledge, stated in the form of objectives. Each objective exists as a component having a very specific function—information sheet, assignment, or job sheet.
Provide appropriate application or practice of content presented	The module assignment and job sheet components provide opportunities for practice and application.
Provide feedback	Each module includes formal feedback opportunities, such as quizzes, written tests, and performance tests (job sheet evaluations). The module learning plan can suggest opportunities for informal feedback, including feedback from the instructor and from a learner's peers. Online learning systems can efficiently implement many forms of feedback, such as chat, email, immediate assessment scoring, etc.
Evaluate mastery	The module tests/assessments, assignments, and job sheets combine to evaluate each learner's mastery of the module competencies.
Provide for retention and transfer	The module can prompt the learner to repeat certain performance items in different settings and/or under different conditions, in order to promote the transfer of learning to different situations.

6: Required and Optional Components

Use the table below as a guide to including components in a self-paced learning module if any of a module's objectives require the learner to:

- Perform a certain procedure, then add a job/procedure sheet.

- Diagnose problems or evaluate conditions, then add an assignment.

- Practice solving problems before performing "live" work, then add an assignment.

- Know or understand specific information, especially safety information, before performing "live" work, then add an information sheet.

- Know or understand specific information before diagnosing problems or evaluating conditions, then add an information sheet.

Table 4
Required Components in a Self-Paced Learning Module

Required	Sometimes Required
- Cover Sheet/Objective Sheet - Vocabulary List - Learning Plan - Pretest and Posttest - Answer Sheet	- Information Sheet - Assignment - Job/Procedure Sheet

If any of a module's objectives deal with new approaches or procedures, then add job/procedure, assignment, and information sheets as needed.

The most important considerations in determining the amount of content needed include:

- What will the learner be required to DO?

- What must the learner be able to DO before he or she can DO the required DO (prerequisites)?

- What must the learner KNOW before he or she can DO what is required?

- Is each instructional component that is being used now, adequate? If not, how can a component be improved or enhanced?

There are three "levels" of time and work involved in creating self-paced learning modules. The difference between each level depends upon how much applicable content already exists in your instructional materials.

LEVEL 1

Cover Sheet • Vocabulary List • Learning Plan • Pretest Posttest • Answers
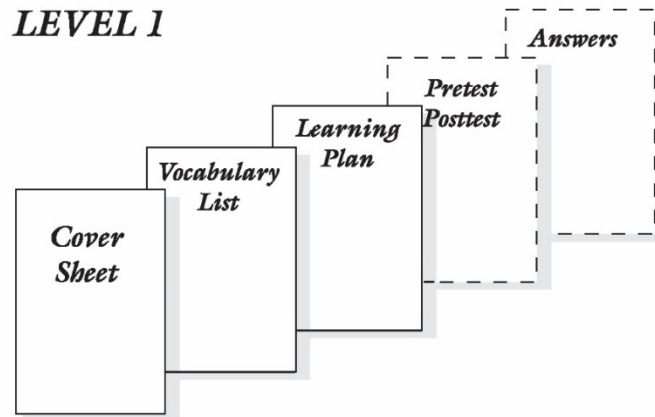
Level 1:

- You already have all of the content needed to address each objective
- Only the basic components are needed to guide learners through the existing content
- Requires relatively little time or effort to produce

LEVEL 2

Cover Sheet • Vocabulary List • Learning Plan • Information Sheet • Assignment Sheet • Job Sheet • Pretest Posttest • Answers
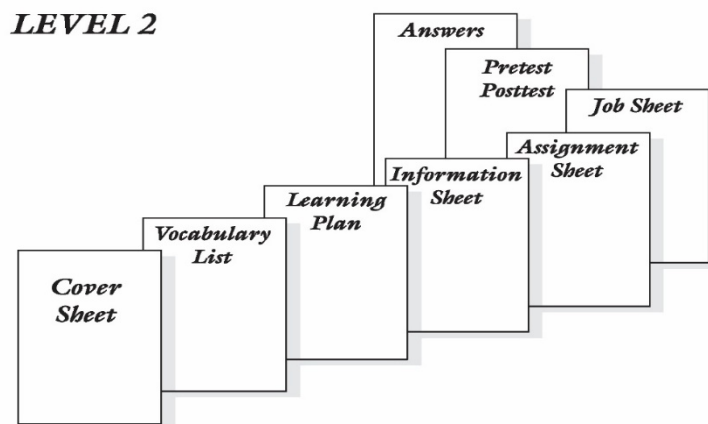
Level 2:

- The existing content adequately addresses most of the objectives; you need to develop a few new objectives to add to the existing content in order to properly cover the topic.
- Additional components such as information sheets, assignments, or job sheets need to be developed and added as needed.
- Related test items and answers will also need to be developed.
- Requires more time than the Level 1 module if additional content exists and no copyright concerns exist.
- Requires even more time if the additional content must be developed (rather than located) or if copyright concerns exist.
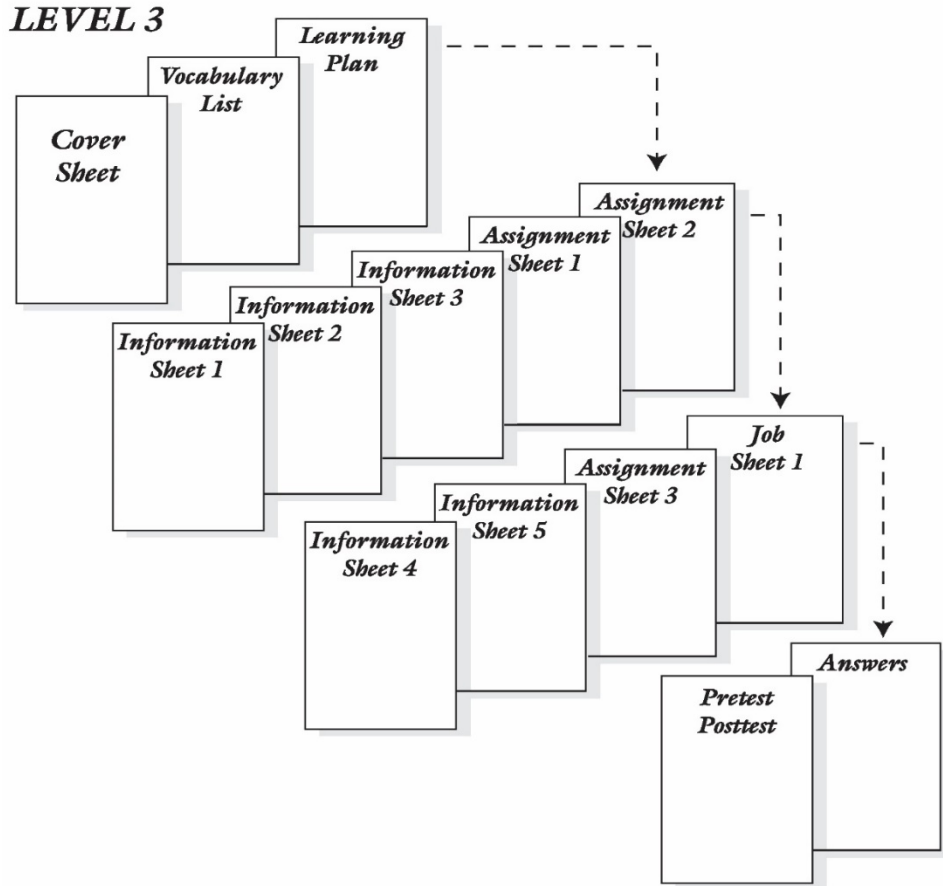
Level 3:

- Few of the objectives are adequately addressed with the content you already have.
- Many new objectives must be developed.
- Many new components such as information sheets, assignments, or job sheets need to be developed and added.
- Many new related test items and answers need to be developed.
- Requires the most time and effort.

7: Reasons for Adapting or Revising Instructional Content

You may decide whether to adapt or revise specific content. Doing so can help:

- Modify the content to match the competencies or standards statements.
- Involve learners as active participants in their own learning processes.
- Capitalize upon the diversities and complexities existing in any learning environment or classroom.
- Make teaching more effective for the teacher and more efficient for the learner.
- Involve the kind of mental operations that lead to a clearer interpretation and understanding.

- Meet the needs of a target population in terms of ability level, interests, goals, etc.
- Use the most current information.
- Supplement an existing resource.
- Eliminate biases in otherwise useful resources from other sources.
- Accommodate variables that have an impact on the instructional process.

    Examples: facilities and equipment, time, number of learners

You might integrate content from multiple sources to help reinforce the learning of an objective.

    Example: To address the objective, "Given the dimensions of a house floor plan, the learner will compute the number of square feet of the house with 100% accuracy," you could:

    o Refer to a relevant chapter in a current textbook or curriculum.
    o Design an activity on computing different measurements.
    o Create or reference a video to demonstrate the process.
    o Provide information from industry associations or companies that emphasize the importance of accurate measurements.
    o Use a structured activity and assessment rubric from a related workbook.

You could also adapt the instructional content by using a variety of content sources to reinforce an objective. For example, digital and printed materials can help build the learner's reading skills; videos can strengthen listening skills (as well as replicate real-world situations); and manipulative aides—such as puzzles, games, experiments, and brainteasers—can emphasize physical handling.

Another way to adapt or revise content is to modify the content to better accommodate the abilities of learners.

    Examples:

    o Identify and explain key terms.
    o Convert a paragraph into a numbered list.
    o Remove unnecessary detail or repetition.
    o Restructure the content to incorporate concepts and thinking skills.

8: Considerations for Organizing Modules

Consider the following when you organize, sequence, index, and identify your self-paced learning modules.

- Organize the module objectives with purpose:

  o *Workplace logic*—Look at the chain of competencies to determine which skills must be learned before others can be attempted.

  o *Dependency*—Determine which objectives depend on the mastery of other objectives, and which objectives are prerequisites.

  o *Ease of mastery*—Place any easily mastered objectives in an earlier module so that learners can experience success early.

- If possible, allow learners flexibility in the sequence of modules to promote motivation and positive attitude.

- Determine when (in the sequence of objectives or learning plan steps) it is appropriate to check for understanding or to evaluate and when to check with the instructor.

  Examples: Insert mini-quizzes or self-check assessments (formative assessments) after groups of objectives, insert a module review before the graded module/unit assessment

  o Include any special instructions or other times leaners must consult the instructor.

  o Include all required safety cautions, warnings and guidelines.

  o Number and title each module so learners and instructors can easily identify them.

  Note: A school numbering and ID system may already be in place. The numbering system should facilitate management of the material and the process; e.g., storage, retrieval, student records, etc.

- Consider color-coding the components in a printed module for ease of recognition by learners.

- Integrate resources that are already available and that meet school standards for quality, accessibility and other criteria.

  Examples: websites, related texts, videos

- When assigning a suggested timeframe to a module, determine the reasonable or average time required to master the competencies.

  Note: You can use your experience as a guide.

9: Resources for Creating Self-Paced Learning Modules

The following are some possible resources for content you may use or refer to in your self-paced learning modules:

- Websites
- Video (you create, or find online, or purchase)
- Books, textbooks, and service/repair manuals
- Fact sheets
- Service and/or safety bulletins or updates
- Other curricula
- Personal knowledge/skills
- Digital photographs (such as those you take yourself)

Choose media (videos, audio files, animations) that support the type of performance expected of the learner. For example, if the learner must distinguish a regular heartbeat from an irregular heartbeat, or identify the sound of an engine that requires servicing, then audio files would be appropriate to include.

Select media that are practical, readily available, and easy for learners to use. Media should also be realistic and reflect occupational activities (including workplace safety requirements). It is also important that any media satisfy accessibility requirements. For example, do videos include transcripts or captions?

When determining which activities to include in your modules, include those that:

- Relate directly to the unit objectives.
- Allow for practice of skills.
- Maintain learner interest.
- Address all learning domains.

Regardless of the type of media you choose, be sure they are legitimate and credible. Avoid sources that present a biased or lopsided point of view (such as an association fact sheet that overlooks a known issue or concern).

10: Accessibility, Usability, and Universal Design for Learning

No two people are the same, and each learner is different. Therefore, it is essential to ensure that all learners can use instructional materials in a self-paced environment, whether that content exists in a print or digital form. *Accessibility*, *usability*, and *universal design* are three distinctly different concepts that relate to physical facilities and customer services, as well as print and electronic media. Applying these guidelines to instructional design makes learning easier for everyone.

Accessibility Considerations

Accessibility addresses the needs of people with disabilities. When first passed, the Americans with Disabilities Act (ADA) set standards for public facilities and services. Amendments to the ADA set legal standards for making electronic media and other information technology accessible to disabled people.

Accessibility for documents includes providing editions printed with large fonts and braille, or making audio books available. For digital media, accessibility means adding descriptive tags for images, making transcripts available for video and audio files, providing accurate descriptions for hypertext links, and ensuring that screen readers can read all content.

> *Example:* Formatting information in a table in HTML on a website instead of including a photo of the table.

Usability Considerations

Usability is a quality attribute that relates to an effective and efficient user experience. If learners find print or digital materials difficult to understand or navigate, they will quit using those materials. Usability attributes include ease of learning the task presented, utility and functionality, and satisfaction with the learning experience.

Readability relates to how well learners understand written content. Level of comprehension is often measured using software tools, such as the Flesch-Kincaid Grade Level Test or the Automated Readability Index. These tests calculate reading levels based on factors such as the length of sentences, the number of characters and syllables in words, vocabulary, and the frequency of special characters.

To reduce the number of long sentences and paragraphs:

- Begin paragraphs with a topic sentence.
- Shorten sentences without making them seem choppy and disjointed.
- Use two or three shorter sentences to revise a long, complex sentence.

To reduce vocabulary problems:

- Replace unfamiliar vocabulary with familiar synonyms.
- Provide a familiar synonym in parenthesis next to difficult words that you want the learner to learn.
- If necessary, add extra words or phrases to make an abstract concept clearer.

Legibility can influence readability. Legibility has to do with the ease with which a learner can distinguish letters and words while reading. For example, when formatting learning materials, designers often select a sans serif, gothic typeface, such as Arial or Calibri. *Sans serif* typefaces are usually composed of strokes of a consistent thickness. *Serif* fonts are typically composed of thick and thin strokes, which can make content more difficult to read for readers with less-than-perfect vision.

Considerations for improving the layout of a document include:

- Aligning paragraphs to the left instead of using justified margins.
- Using larger margins to increase white space.
- Breaking up long passages of text with images or white space.
- Placing illustrations on the same page that they are referred to in the text.
- Using color-coding and font sizes to indicate headings and subheadings.
- Avoiding the use of background images behind text.
- Avoiding the use of all-capital letters.
- Using bulleted lists.
- Using contrasting colors for the background and text.

For digitally distributed materials, providing a linked table of contents and hyperlinks within the text can improve navigation and usability. In addition, make sure learning materials posted on the web load quickly.

Universal Design

Universal Design for Learning (UDL) is a set of principles that applies the broad concepts of accessibility and usability in curriculum development. The idea behind UDL is that making facilities and products more accessible for the disabled makes them more usable for those without physical disabilities as well. The principles of UDL also may take into account other differences in learners, such as culture/ethnicity, gender, age, height, learning preferences, and language capabilities.

> *Example:* While curb ramps are necessary in the physical environment for people in wheelchairs, delivery workers or movers who push carts or hand trucks, parents with strollers, and children on roller skates use them as well. Similarly, video captions assist the hearing impaired, as well as travelers in airports and people for whom English is a second language.

In curriculum design, UDL goes beyond making content accessible—it also challenges learners and provides support. The three principles of UDL advocate:

1. Presenting content in multiple forms.
2. Giving learners multiple options to express what they know.
3. Creating multiple ways to engage and excite learners.

Content developers start by recognizing the various barriers learners may face and addressing them. In this way, the instructor includes all learners from the beginning.

You can find more about these topics at the following websites:

- Assistive Technology Initiative at George Mason University, Accessibility Resources
  https://ati.gmu.edu/resources/accessibility-resources/

- Social Security Administration Guide: Alternative Text for Images
  https://www.ssa.gov/accessibility/files/SSA_Alternative_Text_Guide.pdf

- Microsoft Accessibility
  https://www.microsoft.com/en-us/accessibility/

- National Center on Universal Design for Learning
  http://www.udlcenter.org/

11 : Guidelines for Developing or Using Video

Although self-paced learning modules often include video, the videos you find or make yourself should be more than talking-head lectures. Use video to make your content engaging for learners. Find ways for learners to interact with the content and with each other even during a video portion of the instruction.

As a teacher, you already use a variety of instructional strategies. Incorporating video will follow the same process. Ask yourself:

- **To achieve the learning objectives of this self-paced module, what information do learners need before engaging in any in-class or group activity?** This is information you can provide in a video.

- **What information will I help them discover during the activity?** This is information that you do not need to cover in a video.

- **Are there skills that I need to model for them?** Use video to show learners what to do, such as when you demonstrate a skill.

- **How can I use video to engage learners with the content, spark their curiosity, and motivate them to explore and discover answers to their questions?** While face-to-face lecture gives you opportunities for interaction that are not available in video—such as checking for understanding or taking advantage of a teachable moment that may present itself—there are many ways that video can connect with learners.

The answers to the above questions will help you define the content to include in a video. Once you have answered these questions, you can also decide whether any pre-made video—including videos you located online—will meet the requirements of your learners, learning objectives, and in-class activities.

If you plan to shoot your own video (instead of referencing online videos), you will need some basic equipment:

- **Camera**. This can be as simple as your smartphone or tablet. In some cases, you could use a webcam attached to your computer.

- **Tripod.** Make sure your camera stays steady while recording. The best way to do this is with a tripod.

- **Microphone**. It is best to use an external microphone. These may be available from your school's technology department. Good microphones can be relatively inexpensive to buy.

These are basic tools to get you off to a good start. As you gain experience in making videos, you can better determine what else you need to meet the specific needs of your content and what you want to accomplish.

The following tips offer some good suggestions for producing video for self-paced instruction:

- **Get familiar with how your equipment operates.** Do a few trial runs so you know how to focus the camera, determine a good distance from the camera, and adjust the audio level. You do not want to video record your whole lecture, only to find out it was out of focus the whole time, or that nothing you said is audible.

- **Use proper lighting.** This is especially important if you will be demonstrating a physical task where learners need to see the details of what you are doing.

- **Keep the background simple.** See what learners will actually see from the camera's point of view. You do not want them distracted by too much going on in the background, such as a lot of irrelevant writing on a whiteboard.

- **Make sure you can work without interruption.** Consider putting up a "Do Not Disturb" sign. Turn off your phone. Listen for noises—such as fans, bells, equipment, or outdoor sounds—that you normally do not notice but that may be distracting to learners if recorded in the video.

- **Speak clearly.** When people are watching your video, you do not want them distracted from your content. Avoid long pauses while you think of what to say and be careful not to speak too slowly or too quickly. (A script can come in handy to keep you on track, even if you do not write it out word for word.)

If your content is direct and relevant to your learners, then your videos can be very simple and still be effective. Use the equipment you have to practice recording video. Start out simple, perhaps with a one- or two-minute lecture. Whatever you record, take the time to review it and make notes about what worked well and what you would like to do better next time.

12: Taking Your Own Photos Using a Smartphone

The guidelines below apply to photos that you take using your smartphone.

- Get to know the features of your smartphone camera—and its photo-editing features.

- Keep the camera lens clean and use a lens-cleaning solution periodically.

- Avoid using the camera flash—use natural light or an alternate light source instead.

- Use good posture while holding the phone, or use a tripod.

- If you take a photo and do not like it, take it again and use the best result.

- Get closer to an object rather than zooming in when you take the photo.

  Note: Most smartphone cameras do not use an optical zoom. Instead, they only enlarge and crop the image before capturing the photo. This results in a lower-quality image, which may cause a problem if you need to show the markings on a rule or other fine detail. Instead, try to get closer to a small or near object, or crop a photo of a large object.

- Consider a better camera app (better than the standard one that came with your smartphone) for more settings options.

- In photos of large objects (such as a piece of equipment or a machine), eliminate clutter from the background as much as possible.

- In photos of small objects (such as tools, fasteners, components of larger things), place each item on a plain, light-colored, non-glare surface (such as a matte paper, or fabric) if practical.

- Do not use full-resolution photos in digital media.

  Note: Save images intended for use on a digital device as a jpg or png file with the RGB color setting at 72 dpi using the dimensions of a typical computer screen.

- Be sure that each photo shows what you want learners to see. Make sure that nothing essential ended up outside of the frame of the photo.

- Be sure that whatever will appear in the photo is appropriate.

  Examples: signage, appropriate use of personal protective equipment, visible equipment settings, behaviors of any people

Important: If you use photos from other sources in your self-paced learning modules, always do so only after 1) receiving permission from the source or copyright holder, and 2) giving the appropriate credit to the source in your module or course.

13: Benefits of Digital Learning

Many learners, especially those who hold full-time jobs, have little time for traditional, face-to-face training that can last days or weeks. With blended training, learners complete a portion of the training on their own time; and they also meet in person to work on collaborative projects and to practice hands-on skills. For example, the learners read information sheets and articles, complete practice quizzes and self-checks, participate in forum discussions, and watch supplemental lecture and skill demonstration videos at home. They can access PowerPoint presentations online and download the slides to a device—such as a tablet computer or even a smartphone—or print and bring them to class to help them follow the lecture.

Sometimes, the instructor begins the in-person portion of the course with a brief overview of the reading and homework assignments. The instructor and learners then spend the rest of the class time practicing the relevant hands-on skills or working on team projects. In other instances, learners complete assignments and activities before meeting with the class in person. Different forms of the blended classroom model work for learners of all ages and in varied settings.

Completing a substantial portion of their learning online greatly reduces the amount of time that adult learners must be away from their jobs or family. It encourages learners to become more responsible for their individual progress. Digital delivery also can give instructors more time to work with individuals or small groups and to help learners apply their newly acquired knowledge.

14: Copyright and Fair Use Information for Educators

This section provides general guidelines for using copyrighted material in the classroom. Think of these guidelines as "guardrails." This information does not constitute legal advice. Before duplicating a work for educational purposes, do a little research. When in doubt, check it out—always seek permission from the copyright owner or consult with an attorney if necessary!

Copyright laws protect the intellectual property of writers, musicians, videographers, photographers, artists, and others who author or produce original works and ideas.

Compilations, such as phone directories, ideas and works in the public domain, publicly known facts, and works created by federal employees as part of their official job duties cannot be copyrighted.

Public Domain

Works in the "public domain" include creative works not protected by copyright that anyone may freely use. This may include works for which the copyright has expired, works for which the original author failed to secure a copyright or intentionally relinquished it, or for many works published by the U.S. federal government.

People often hold the common misperception that all works funded by the government fall in the public domain. However, contractors performing work on behalf of the federal government and state employees may copyright their works, unless previous contracts or written agreements stipulate otherwise.

Fair Use

The Fair Use Doctrine provides for limited use of copyrighted works without having to seek permission from the copyright owner. No universal guidelines exist for determining what constitutes fair use. Instead, the decision to use materials must consider four factors:

- **The purpose and character of the use.** Typically, commentary, new reporting, parody, and criticism provide an appropriate context for fair use. Personal, nonprofit, and educational purposes are more likely to fall under fair use. Commercial uses can sometimes be allowed, if the content has been repurposed.

- **The nature of the work.** Using work belonging to someone else requires getting permission well in advance. The use of unpublished or artistic works is less likely to fall under fair use.

- **The amount of the work to be used.** As a rule of thumb, using 10 percent of the work or less may be permissible. The consideration of fair use becomes less as more of the work is used.

- **The marketability of the work.** Use cannot compete with sales to the intended audience or in any way diminish owner royalties.

Court decisions have simplified fair use considerations to two questions:

1. Is the intended use of the work transformative? In other words, does it repurpose the work for a new audience?
2. Is the quantity of the work to be used appropriate to achieve the transformative purpose?

What Can be Used?

Generally speaking, instructors may use materials for a limited time in the following proportions:

- A chapter from a textbook or manual.

- An article from a magazine or newspaper.

- A short story, essay, or poem from one author.

- A chart, graph, illustration, or photo from a book, magazine, or newspaper.

Words for the Wise

- Use reliable, credible sources. Be especially conscientious with internet resources, which may be copyrighted (even if no copyright notice, such as on certain media), posted illegally, or inaccurate.

- Never copy an entire book or magazine.

- Paraphrasing is not necessarily a solution:
  - Can include 1) restating in your own words, and 2) significantly changing the style structure without changing the main ideas.
  - Does not mean changing a few words.
  - Even "honest mistakes" are not legal or acceptable.
  - Paraphrased content must have a citation.
  - If you change the ideas, you are misrepresenting the original information.

- If the use seems to satisfy fair use criteria, credit the source for text, images, and video for professionalism and for credibility.

  Note: Citation is also a good idea so that you can keep track of the sources of your course or module content. In a year or two, you may not remember where you obtained a photo or a quoted page of text, but the citation will remind you.

- Use recent, easy-to-verify resources.

- Gather classroom materials well in advance of when you need them to avoid the temptation of making unauthorized copies.

- Seek permission to use copyrighted materials as early as possible, and keep a copy of the permission information once received.

  Note: Organizations, agencies, and companies may have formal processes you must follow to request permission to use their content. You can usually find these requirements on their websites. With individuals who are copyright holders, you should email the individual. Keep a copy of all of the responses you receive.

- Do not plan to use the copyrighted materials indefinitely.

- Just because something is online, does not automatically mean it is in the public domain. This includes federal government publications. Check the copyright information for each website when gathering information from online sources.

  Note: In many government publications, you can find the copyright information in the first few pages of the document. You may also find a statement about the allowable use of the content, as well as the preferred way to cite the title as a source.

- Do not ignore copyright restrictions: it can cost you and your employer.

- Create your own, original work and avoid copyright issues.

- Credit all sources for credibility, for a visible record of sources/ownership, and for professionalism/good practice.

Many organizations host websites that help explain what constitutes fair use for educators, including the Library of Congress, http://www.loc.gov/teachers/usingprimarysources/copyright.html.

For educators, sometimes the factors that define fair use are not clear-cut. Do what is right and use and cite your resources properly.

- Talk to them about copyright. Explain the proper way to cite resources.

- Encourage learners to make use of an online plagiarism checker to scan their work. Some learning management systems even have a plagiarism check built in.

- Instead of copying questions from a website or textbook for learners to answer, create assignments that require learners to think independently and apply their knowledge.

- Make learners aware of any policies concerning learner conduct and the expectations for academic honesty. If your school or agency has an honor code, consider asking learners to sign a statement promising they will abide by it.

- Watch for consistency in each learner's work. If a person has a history of making grammatical errors, but then turns in a particularly well written assignment, it could be that the person copied someone else's work, perhaps even unintentionally.

15: Initial Planning Checklist

Planning is critical to help learners master intricate and difficult procedures. Taking the time to plan will help ensure nothing remains undone or unaccounted for. Planning will also help prevent last-minute emergencies. It gives you time to organize your lessons and revise them if needed. This checklist guides you through the planning process. Refine the steps to suit your particular needs.

1. Choose a lesson as a basis for a self-paced learning module.
2. List the objectives that each lesson will cover.

   Note: You can make a simple list on paper or create a table in MS Word.

3. Annotate the objectives list with titles, ID number, and locations of instructional material you currently use with the existing lesson.
4. Add the names, proposed ID number, and locations of instructional content that is readily available.
5. Add the names and proposed ID number of any content that you need to develop.
6. Sequence the lists into an occupationally logical flow.
7. Insert evaluation and assessment checkpoints into the list.
8. Save your lists.

Module 2
Creating the Cover Sheet/Objective Sheet

Objectives

1. Profile the cover sheet/objective sheet.
2. Identify guidelines for creating a cover sheet/objective sheet.
3. Complete the cover sheet/objective sheet checklist.

1: Cover Sheet/Objective Sheet Profile

The cover sheet/objective sheet summarizes each module for the learner and the instructor. It serves as a "table of contents" for the module. It also explains to the learner the importance and/or relevance of the module to the larger course of study (the context of the module).

The outline of the cover sheet/objective sheet should include these elements:

■ **Program Title**—The program title should identify the larger program to which the module belongs.

   Example: Building and Grounds Maintenance

■ **Module Title**—The module title should be the same as a unit or chapter title in your curriculum (unless you are creating all of the contents of a module). It should also include the module reference number that follows the numbering system for modules at your technology center.

   Example: "BGM A-1: Orientation to Building and Grounds Maintenance"

■ **Introduction**—The introduction provides the rationale for the module. It should introduce learners to the module topic and its importance to them. It should relate the module to the learners' experiences and to their "need to know," help capture their interest, and focus their thoughts. The Introduction also serves as an "advance organizer" for learners.

■ **Prerequisites**—The prerequisites should identify any modules that learners should have already successfully completed. It should refer to those modules by title and number.

- **Module Objective**—The module objective states the overall goal of the module. It states what the learner will be able to do after successfully completing the module. (It may also identify the standards used to measure learner performance.)

- **Specific Objectives**—The specific objectives is a listing of the objectives or competencies that learners must complete to reach the module objective. They are listed in the sequence in which learners must complete them.

- **Other**—As determined by the format for self-paced learning modules at your school.

  Examples: reference to latest revision date, reference to recommended/needed time range (to complete the module)

Note: For digital delivery, begin the instructional development process as you would for print to make it easier to visualize and organize the content. Include the same curriculum features. Reviewed and edit the curriculum before posting the content online. Create web links to each component in the digital course.

2: Cover Sheet/Objective Sheet Guidelines

- Create a cover sheet/objective sheet for each unit of instruction in your curriculum. If you are using a product that already contains much of the cover sheet/objective sheet information, add your program-specific information.

- Use the approved numbering system for modules at your school, if applicable.

- Write the introduction:
  o Keep it short (one paragraph).
  o Use the second person conversational style (so that you are speaking directly to the learner).
  o Use short sentences with appropriate terminology.

- Identify the specific objectives for each module:
  o If your course/program already specifies the specific objectives or competencies each learner must master, repeat those that apply to the individual learning module.

    Examples: objectives from your lesson plan for a particular module; objectives from a national standard or duty-task list; objectives from a textbook chapter/unit introduction; etc.

- If specific objectives or competencies are not provided, or if you are creating the module content, then you must write the specific objectives:
    - Use the second person form, starting with the verb (performance term).
    - Use the appropriate verb for the content presented or for the performance required.

        Examples: list, match, solve, apply, etc.

    - Organize the objectives in a sequence that is logical for the occupation or program.

        Example: Knowledge-level objectives should come before the related task-level objectives. *Simpler or enabling competencies should come before higher-order ones.*

    - Identify the assignment and/or job sheet objectives where they logically fit in the sequence of instruction.

        Example: Put "Assignment #" or "Job Sheet #" in parentheses after the objective statement.

- Make sure that learning activities—assignment or job sheets—satisfy the following criteria:
    - Relate directly to the module objective.
    - Allow for essential skill practice.
    - Vary to maintain learner interest.
    - Provide for feedback and reinforcement of performance

3: Cover Sheet/Objective Sheet Checklist

This checklist will help you to start planning a cover sheet/objective sheet for one self-paced learning module. In this activity, you will record some notes for a cover sheet/objective sheet that you can create later. You can then apply this skill to the other modules in your curriculum/program.

Respond to each item. Review your responses later as a starting point for creating a cover sheet/objective sheet.

1. Name the program title that would apply to your self-paced learning modules.

2. Identify one of the module titles.

    Note: Use a unit/chapter title from your curriculum, or other instructional materials, or think of a set of related specific objectives or competencies. What title would you give to that set?

3. Write a sample Introduction for your module. Write 4 to 5 sentences that:

- Provide the rationale for the module.

- Introduce learners to the module topic and its importance.

- Relate the module to the learners' experiences and to their "need to know."

- Help capture learners' interest and focus their thoughts.

Note: You can modify this introduction from an existing unit introduction or it can be something original that you write.

4. Identify prerequisites that would apply to this module. State "None" if there are no prerequisites.

5. Write the module objective for this module. State the overall goal of the module (what the learner will be able to do after successfully completing the module).

6. Identify the source of the specific objectives for this module. For example:

- Does an existing list of objectives apply to this module? Repeat those specific objectives.

- Does a textbook unit/chapter list of objectives or topics apply to this module? Repeat or modify those specific objectives.

- Does a national standard or other skill standard apply? Write those specific objectives.

- If none of the above applies, write original specific objectives for this module. Make sure the specific objectives cover the content (what learners must know and do).

7. Estimate the time learners should need to complete this module.

Module 3
Creating the Vocabulary List

Objectives

1. Profile the vocabulary list.
2. Identify guidelines for creating a vocabulary list.
3. Complete the vocabulary list checklist.

1: Vocabulary List Profile

The vocabulary list defines key terms relating to the specific objectives in each module. The purpose of identifying and defining these terms is to help learners to use them appropriately in context. They also contribute to learners' understanding of the objectives where the terms appear. The vocabulary list usually includes technical or occupational terms that directly apply to the objectives in the module. It can also include general terms that learners should be able to use correctly.

Terms and definitions from the vocabulary list can be included in the pretest/posttest for the module. You can also include them in a separate "vocabulary test" component that you create.

Note: In a digital course or learning management system, terms and their definitions may exist in a glossary, or they may be a feature within individual objectives. Also, most learning management systems include an interactive glossary that enables teachers to organize and display key terms. In most digital glossaries, instructors have the option to automatically link terms and phrases in the text to their definition.

2: Vocabulary List Guidelines

- Create a vocabulary list for each unit of instruction in your curriculum. If you are using a product that already contains terms and their definitions, refer learners to them.

- Identify terms in each module that should be defined, including:

  o Highlighted terms in the content.
  o Technical terms, abbreviations, and jargon unique to the content.
  o Terms used in the workplace with respect to the specific objectives.
  o General terms that learners should use correctly.

- State each term using lowercase letters (unless a proper noun).

- Write each definition as a sentence fragment beginning with a lowercase letter.

  Example:

  split application—dividing the year's fertilizer into two or more parts; often a portion of the fertilizer is applied before planting and later applications are made after growth has begun

- Write to the learner's level of expertise and comprehension.

- Separate parts of a definition, if needed, using semicolons.

- Alphabetize your final list.

3: Vocabulary List Checklist

This checklist will help you start a vocabulary list for one self-paced learning module. In this activity, you will identify some terms for a vocabulary list you can create later. You can then apply this skill to the other modules in your curriculum/program.

1. Think of the module you summarized in the cover sheet/objective sheet checklist. What are three to five terms you would define for the specific objectives in that module?

2. Write or locate a simple definition for each term.

3. Review this checklist later as a starting point for creating a vocabulary list.

Module 4
Creating the Learning Plan

Objectives

1. Profile the learning plan.
2. Identify guidelines for creating a learning plan.
3. Complete the learning plan checklist.

1: Learning Plan Profile

The learning plan is a guide to learners' self-study. It guides each learner step-by-step through the *content* of a module. This content can range from all-commercial content (from publishers, media providers, and other sources), all instructor- or school-developed content, or a combination of both.

Example: The steps you list in the learning plan can refer to a combination of existing resources and those you develop. Resources can include textbooks, videos, websites, handouts, lab equipment, as well as content *you develop* to supplement or revise the existing materials you use.

The learning plan also specifies the *sequence* of experiences each learner must follow to complete the module. It does this by listing the steps in a numbered order that you determine.

Note: The order of activities in the learning plan should parallel the order of the specific objectives from the module cover sheet/objective sheet.

2: Learning Plan Guidelines

Create a learning plan for each unit/module of instruction. Build each learning plan by following these steps in order.

1. **Make a list of the module's specific objectives, by number.** For each assignment or job sheet objective, put the action verb "Do" before each objective number. For the remaining objectives, put the verb "Study" before each objective number.

Example:

STUDY Objective 1.

STUDY Objective 2.

STUDY Objective 3.

STUDY Objective 4.

DO Objective 5, Assignment 1.

STUDY Objective 6.

DO Objective 7, Assignment 2.

STUDY Objective 8.

DO Objective 9, Assignment 3.

2. **Expand each STUDY or DO statement.** Add more specific instructions to identify where the objective content is located. It can include existing resources, content you developed, or a combination.

Example:

STUDY Objective 1. Go to your textbook, Unit 6, page 87.

STUDY Objective 2. Go to your textbook, Unit 6, page 92.

STUDY Objective 3. Go to Information Sheet 1 in this Learning Module.

STUDY Objective 4. Go to Information Sheet 2 in this Learning Module.

DO Objective 5. Go to Assignment 1 in this Learning Module.

STUDY Objective 6. Go to your textbook, Unit 6, page 122.

DO Objective 7. Go to Assignment 2 in this Learning Module.

STUDY Objective 8. Go to your textbook, Unit 6, page 127.

DO Objective 9. Go to Assignment 3 in this Learning Module.

3. **Add new statements to guide learners to other media and to other components in the module, as appropriate.** Insert them in the proper sequence.

4. **Decide if and where to add opportunities for discussion, collaboration, and/or feedback within the sequence.**

Examples: Are team or group discussions appropriate? Are team or instructor reviews of draft work needed? Are quizzes, team activities, or additional application activities needed?

5. When your list is finished, number each item.

Use standard text to create the learning plan for each module. Block, copy, and edit the text from a previous learning plan; or, create a template of standard text.

If you will create new content for a module, develop and organize those components first. Then, create the learning plan. It will be easier for you to create the learning plan if you have already developed and sequenced the module's contents.

Note: In a digital course, the way the course is organized and the links to the various assignments and activities should follow the structure of the learning plan.

3: Learning Plan Checklist

The following checklist will help you create a learning plan for a self-paced learning module. Choose activities that would guide a self-directed learner through a unit/module of instruction. You can then apply this skill to the other modules in your curriculum/program.

Respond to each item. Review this checklist later as a starting point for creating a learning plan.

1. From your responses to the cover sheet/objective sheet checklist, identify three to five specific objectives for a self-paced learning module. List them by number only (Objective 1, etc.) and leave space between each.

2. Add the appropriate verb "DO" or "STUDY" in front of each objective.

3. Add more specific instructions to identify where the content is located for each objective.

4. Add new statements to guide learners to other media and to other components in the module, as appropriate.

5. Decide if and where to add opportunities for discussion, collaboration, and/or feedback within the sequence.

6. Number each item in the final list.

7. Update the learning plan for each module as you find or remove resources.

Module 5
Developing Information Sheets

Objectives

1. Profile the information sheet.
2. Identify guidelines for creating information sheets.
3. Apply considerations for content and style.
4. Describe online search techniques.
5. Complete the information sheet checklist.

1: Information Sheet Profile

The information sheet applies:

- If you add new objectives.
- If you made any content changes (such as to update the content or to localize instruction).
- If all of the content is original (such as a module you are adding to a curriculum).
- If equipment, tools, machines change.

    Example: You may have to revise or replace diagrams or instructions.

The information sheet provides "must know" content that is not provided in other learning resources (textbooks, videos, handouts, websites and other sources). It should include content that is worth testing over on the pretest/posttest.

The information sheet can supplement existing content resources or it can provide all of the cognitive content for a module.

    Example: If you are creating all of the content for a module (there are no other sources of the content), then the information sheets are the components that present that content. For example, assume you want a module that serves as an introduction to your program. You would want to address topics such as learner and teacher responsibilities, safety rules, tool usage, facilities orientation, and emergency response procedures. This content is original; it does not come from your textbooks, lab workbooks, or other learning resources. You would create separate information sheets for each topic.

2: Information Sheet Guidelines

- Determine the need for the information sheets in a module:

    o Is any essential (testable) content missing from other learning resources (textbooks, videos, handouts, websites or other sources)?

    Examples: Content that you create, supplemental content, new or revised objectives

    o Are any specific objectives (from the cover sheet/objective sheet) new or revised?

    o Do any assignment or job sheet objectives require enabling knowledge or skills?

- Outline each information sheet before writing it.

    Note: An outline will help you to organize the content of the information sheet in advance. It can also make it clear whether you have left anything out or included too much! An outline also works as a time management tool; it gives you an idea of the time needed to write the information sheet.

- Make sure each information sheet relates to one or more specific objectives in the module.

- Use multiple sources for each topic, if possible.

- If you add an assignment or job sheet, add the necessary information sheets to prepare the learner to complete the written or hands-on tasks.

- Write to the learner's level of expertise and experience.

    Note: As you write, imagine you are the learner reading the content. Is it simple and direct? Is it easy to understand?

- If the information sheet content already exists—such as a handout you have been using or a school form—and the content is not copyrighted by anyone else, use the content as-is or edit as needed.

    Example: You could type "Information Sheet" and its number on the existing document, or type and edit the content to satisfy your requirements.

- Use familiar terms and vocabulary relevant to the occupation or field.

- Include required figures and/or graphics as appropriate.

- Number your information sheets so you can easily refer to them.

    Note: Numbering each information sheet allows you to guide learners to the specific component in the learning plan.

- Review each information sheet. Make sure it contains only the needed content.

- Limit the scope and length of each information sheet. Make sure the learner can complete each one in a reasonable amount of time.

3: Content and Style Considerations

- **Capitalization**—Use *The Gregg Reference Manual, The Chicago Manual of Style, The Publication Manual of the American Psychological Association,* or other standard to answer questions about punctuation, grammar, and capitalization.

- **Courtesy line**—Include a courtesy line to acknowledge the use of original work (other than copyrighted content). A courtesy line evidences the professionalism of the writer in incorporating others' work. It can also help you to track the sources of the content in your modules. The source of the original work may specify the preferred wording of a courtesy line. If not, then create your own.

    Example: *"Courtesy of Oklahoma Forestry Division, State Department of Agriculture."*

- **Hazard alerts/warnings**—Include appropriate hazard alerts where needed. If used, they should appear *before* the learner performs the activity being warned about. When the same alert is appropriate in multiple places, use the same wording in each alert. Choose the appropriate alert as follows:

    DANGER—Use if the situation will lead to death or serious injury if not avoided.

    WARNING—Use if the situation could lead to death or serious injury if not avoided.

    CAUTION—Use if the situation could lead to minor or moderate injury.

    NOTICE—Use if the situation could cause property damage only.

    IMPORTANT—Use to refer to operating or maintenance tips.

- **Pronouns**

- Structure your text to be gender-neutral. Use plural nouns and pronouns. In the case of scenarios or case studies, balance your use of male and female names.

- Use the pronoun "you" when you are writing directly to the learner.

■ **Referencing**

- **Book titles**—Refer to book titles in text by title in *italics* (or underline the title).

- **Internet addresses**—When referring to an internet address in text, place punctuation (such as a period) outside the symbols.

- **Videotapes**—Refer to videotape titles in text by title/name of production in *italics*.

- **References**—Cite your sources following the guidelines of an organization such as the American Psychological Association (APA).

■ **Sequencing**—Present simple concepts before more complex ones.

■ **Writing style**

- Write in active voice.

  Example: "The technician produces the required result…" instead of "The required result is produced by the technician…"

- Use the pronoun "you" when writing directly to the learner (reader).

- Use the articles "a," "an," and "the" (instead of writing in "telegram style" without articles).

- Use complete sentences as often as appropriate.

- Use "white space," such as ample margins or double-spacing between paragraphs, to encourage reading.

- Avoid mixing several fonts.

- Avoid blocks of text in UPPERCASE letters. Uppercase text is hard to read in lengthy segments. It is fine for major headings or other limited uses.

Note: When formatting information for an online course, divide content according to subheadings. This will limit excessive scrolling. In addition, even though educational materials often are printed in black and white to reduce costs, formatting for the web allows the use of spot colors for headings and subheadings, photos, and charts.

- For more tips to improve your writing, check the handy guide produced as a part of the Federal Plain Language Guidelines:
  http://www.plainlanguage.gov/howto/guidelines/FederalPLGuidelines/index.cfm

- The Plain Language Action and Information Network (PLAIN) also offers some humorous "rules for good writing":
  http://www.plainlanguage.gov/examples/humor/writegood.cfm

- The U.S. EIA (Energy Information Administration) has an easy-to-use style guide that can help improve your writing:
  https://www.eia.gov/about/eiawritingstyleguide.pdf

- The Centers for Disease Control and Prevention has a free guide:
  https://www.cdc.gov/healthliteracy/pdf/Simply_Put.pdf

4: Online Search Techniques and Sources

The internet can be a key resource as you develop your own information sheet content. A search engine is a database of web page files. When you initiate a search, you are asking the search engine to match the keywords you provided to the text in the pages and documents in the database. As a result, a simple search request can yield hundreds of results. To find the most useful resources, it is important to use search techniques that can help to filter your search results. One technique is to use or, and, and not:

- If you search for "nuts **or** bolts," your search results will include links related to either nuts or bolts.

- If you search for "nuts **and** bolts," your search results will include links related to both nuts and bolts in the link.

- If you search for "nuts **not** bolts," your search results will include links related to nuts but will omit links that reference bolts.

Choosing the right keywords is also essential to finding the most appropriate resources. Using the right keywords will save you many hours of sorting through results that do not meet your needs. You should use keywords that relate to the essential concept of your search, then narrow your search results by using more specific terms, as needed. It may be helpful for you to break your search topic down into key concepts. You can then make a list of possible keywords that relate to those concepts, before you start your online search.

Example: You want to find online resources about the challenges faced by family caregivers. Start by searching for "family caregivers," then search for "family caregiver challenges."

Some search engines will create a "suggested topics" list based on your search. If so, try those topics as well. Be sure to check the spelling in your keywords; spelling will affect the results that the search engine compiles. Use singular and plural forms of keywords to get different results. Think of synonyms and related terms for the concepts on your list.

It is also important to enclose your keywords in quotation marks. Without quotation marks, the search engine will search for each keyword individually, which will generate many more results that are not specific to your topic.

Example: Search for "learning disabilities adults" instead of learning disabilities adults.

A number of search engines exist. No single search engine can access the entire web. Some search engines are general; others specialize by subject area. (You can search online for "search engines list" to come up with a current list.)

Some of the most common general search engines include ask.com, bing.com, dogpile.com, google.com, google scholar (scholar.google.com), and yahoo.com.

It is important to remember that the results of your online searches do not pass through any filter for usability. There is no digital review process that sorts out the usable from the junk resources. The sorting process is up to you. Once you have found some resources, you must decide whether those sources are valid. A valid resource is one that is relevant to the subject, accurate, and objective (not based on opinion, point of view, or special interest support).

To help ensure content validity, create content based on multiple sources of information. Some key questions to ask about sources include:

- Does the source target an audience similar to your group of learners?

- Is the author (of the online content) qualified in the subject? If no author is listed, was the information produced by a reliable source, such as a government agency or university?

- What do other users say about the content (in their reviews/comments)?

- Do professionals in your field rely upon this resource? Do your professional colleagues have an opinion about the resource?

- Do reputable organizations and authorities cite this source?

- Does the content include research-based information (rather than editorializing or stating opinions)?

- Could advertising or endorsements suggest that the content may be influenced by private companies, political organizations, or other groups?

- How is the reported data gathered?

- Does the source include a date indicating whether it has been posted or updated within the last three years?

- Is there evidence of a content and design standard?

- Is there evidence of a formal review process such as editing?

5: Information Sheet Checklist

T his checklist will help you create information sheets for a self-paced learning module. You will list some topics that could become separate information sheets. You can then apply this skill to the other modules in your curriculum/program.

Respond to each item. Review this checklist later as a starting point for creating an information sheet.

1. Review the specific objectives you listed for the cover sheet/objective sheet checklist.

2. Determine whether you must develop new information sheets to cover those specific objectives:

   A. Are all of the specific objectives already covered by your existing learning resources? If Yes, then you probably do not need to develop information sheets.

   B. Do any of the following apply? If Yes, then you may need to develop one or more Information sheets:

      • Add new objectives?
      • Any content changes (such as to update content or to localize instruction)?
      • All of the content is original (such as a module you are adding to a curriculum)?
      • Equipment, tools, or machines change?

3. Write the topics (from the cover sheet/objective sheet checklist) that may require new information sheets.

4. What are three to five resources you could use to develop the information sheet(s)?

Module 6
Developing Assignments

Objectives

1. Profile the assignment.
2. List benefits of grading rubrics.
3. Identify guidelines for creating assignments.
4. Complete the assignment checklist.

1: Assignment Profile

The assignment applies:

*   To add new application-type objectives.
*   To update/revise an existing assignment.
*   To provide a practical application for new information sheet content.
*   To allow learners to apply higher-order thinking skills.

    Examples: problem solving, synthesizing, analyzing, evaluating

*   To allow learners to participate in cooperative learning activities.

Each assignment immediately follows one or more information sheets that enable or prepare the learner to complete the assignment. The assignment addresses the learning levels at or above the application level. It allows learners to perform non-psychomotor activities related to occupational tasks. (Assignment activities have been described broadly as "paper-and-pencil" activities to distinguish them from "hands-on" activities in the job sheets.)

Assignment activities can involve software, video, handouts, models, online resources, and other resources as appropriate to the activity. They can also be "paper-and-pencil" activities. *Each assignment should be a valid task and reflect skills needed for employment or course completion.*

The format of each assignment activity may vary as appropriate for the activity. For example, it could include a set of questions to answer, forms to interpret or complete, or diagrams to study.

Each assignment should include the following *elements*:

- **Objective.** Each assignment should match a specific objective from the cover sheet/objective sheet. The objective should be an exact restatement of the objective number and text as it appears on the cover sheet/objective sheet.

- **Introduction.** This is a short lead-in to the activity. It can describe the context of the activity, its importance in the workplace, its relationship to other objectives, etc.

- **Equipment and Supplies.** This is a list of the resources required for the learner to complete the activity.

  Examples: paper, pencil or pen, video (title), software (title), internet access, tools, manuals, lab equipment/supplies

- **Instructions.** This section lists the steps to complete the assignment activity, written in the form of directions to the learner. Instructions must be specific and detailed. They must enable learners to successfully complete the activity on their own.

- **Evaluation Criteria (Optional).** This section lists the criteria the instructor will use to evaluate each learner's completed activity. The evaluation criteria can be in the form of a rubric.

  Note: If you include this element on one assignment, you should include it on all assignments in a module and in all modules in a curriculum/course.

You should list the answers to each assignment activity in the appropriate instructor component. Digital courses may allow for automatic scoring of assignment activities.

2: Grading Rubrics

A rubric is a grading tool that explicitly states the expectations for an assignment or item of work. It separates the activity or work into its component parts or attributes and describes the characteristics of each part or attribute along a scale of mastery levels.

A common format for a rubric is a table that lists the grading criteria in one column, with the other columns identifying the various levels of performance and the score for each level. A description explains each performance level. A rubric may specify a single point value for each level of performance/achievement, a range of points, or no points (if the rubric is intended to provide feedback only).

Example: A rubric template

ACTIVITY:				
	Performance Level 3 **Points/Range**	**Performance Level 2** **Points/Range**	**Performance Level 1** **Points/Range**	
Criterion 1	Description	Description	Description	
Criterion 2	Description	Description	Description	
Criterion 3	Description	Description	Description	
Criterion 4	Description	Description	Description	
Criterion 5	Description	Description	Description	

Grading rubrics are a helpful tool in self-directed learning, whether in print or digital form. Rubrics are often the basis for assignment or activity evaluation and are a part of the assignment or activity. You can search online for sample rubrics for almost any subject or activity. You can also create them yourself using an online rubric generator or even a blank sheet of paper. Benefits of rubrics include:

- Provide learners and others (such as parents and employers) with expectations in advance.
- Improve feedback to learners.
- Help to evaluate higher-order skills or complex activities.
- Encourage learners to become self-directed.
- Encourage learner self-assessment.
- Remove subjectivity from grading (and reduce disagreements with learners).
- Make grading easier and reduce the time required for grading.
- Can help motivate learners by providing a standard in advance of performance.
- Allow for consistent grading by different teachers or evaluators.
- Encourage teachers to reflect upon their content and prioritize what they want learners to achieve.

Example: A rubric for an oral presentation

Oral Presentation Grading Rubric

	9-10 pts.	7-8 pts.	0-6 pts.	Learner Score	Teacher Comments
Preparedness	Learner is completely prepared and has clearly rehearsed.	Learner seems fairly prepared but could have used more rehearsal.	Learner does not seem prepared to present.		
Stays on Topic	Stays on topic all of the time.	Stays on topic most of the time.	It was hard to tell what the topic was.		
Speaks Clearly	Speaks clearly and distinctly all the time, and mispronounces no words.	Speaks clearly and distinctly most the time. Mispronounces words occasionally.	Often mumbles or mispronounces words. Hard to understand.		
Posture and Eye Contact	Stands up straight, looks relaxed and confident. Establishes eye contact during the presentation.	Stands up straight and establishes eye contact some of the time during the presentation.	Slouches and/or does not look at people during the presentation.		
Content	Shows a full understanding of the topic.	Shows a good understanding of the topic.	Does not seem to understand the topic very well.		
Total Points					**50 points possible**

Note: When setting up assignments in a web-based course, keep in mind that most learning management systems include the ability for instructors to add scores to an online rubric by simply clicking the appropriate box.

3: Assignment Guidelines

- Restate and number the assignment objective exactly as it appears on the module cover sheet/objective sheet.

- In the Introduction, consider information such as the following:
  - Technical or procedural information that applies to the specific activity.
  - Explanatory information about the procedure or activity that would not be known otherwise.
  - Hazard alert or cautionary information for special emphasis.
  - The context of the activity, its importance in the workplace, and its relationship to other objectives.

- Arrange the items in the Equipment and Supplies list in a logical order.

  Examples: alphabetical order, logical groupings, food and non-food items, items for checkout, and personal (consumable) items

- Write the Instructions in the second-person form (directly to the learner).

- Begin each instruction with a verb (as with a command).

- Include opportunities for learner collaboration, communication, and/or reflection as appropriate.

- State the evaluation criteria, if included, in terms of objective measures of the learner's work. Consider a rubric approach that defines levels of performance.

- Identify multiple opportunities for feedback to the learner, as appropriate, from the instructor, peer groups, team members, industry representatives, and other sources.

- When posting assignments on the web, format them as a web page when possible to ensure accessibility. When using PDFs, make sure text can be scanned using a text reader.

- In an online course, make sure learners understand how to submit their completed assignments.

4: Assignment Sheet Checklist

This checklist will help you create an assignment for a self-paced learning module. You will outline what could become an assignment. You can then apply this skill to the other modules in your curriculum/program.

Respond to each item. Review this checklist later as a starting point for creating an assignment.

1. Review the specific objectives you listed for the cover sheet/objective sheet checklist.

2. Determine whether you must develop a new assignment:

   A. Do your existing learning resources already include all of the necessary assignments? If Yes, then you probably do not need to develop an assignment.

   B. Do any of the following apply? If Yes, then you may need to develop one or more assignments:

      • Add new application-type objectives?
      • Update/revise an existing assignment?
      • Provide a practical application for new information sheet content?
      • Allow learners to apply higher-order thinking skills?
      • Allow learners to participate in cooperative learning activities?

3. If (2.B) applies, write the objective for the needed assignment.

4. Write a sample Introduction for the assignment. Write three to five sentences that address:

      • Technical or procedural information that applies to the specific activity;
      • Explanatory information about the procedure or activity that would not be known otherwise;
      • Hazard alert or cautionary information for special emphasis; and/or
      • The context of the activity, its importance in the workplace, and its relationship to other objectives.

5. What equipment and supplies are needed? List one to five items.

6. How would you instruct learners to complete the activity? Write your instructions.

7. What are resources you could use to develop the assignment activity?

8. What criteria would be appropriate to evaluate each learner's completed work? List the criteria. Find a related grading rubric online, or create your own using an online rubric generator or a sheet of paper. See the blank rubric template below.

Example: Blank rubric template

ACTIVITY:					
	Excellent	**Good**	**Poor**	**Missing**	
	3 pts.	**2 pts.**	**1 pt.**	**0 pt.**	

Module 7
Developing Job Sheets (Performance Tests)

Objectives

1. Profile the job sheet.
2. State guidelines for developing performance test items.
3. Describe hazard alerts in performance tests.
4. Identify guidelines for creating job sheets.
5. Complete the job sheet checklist.

1: Job Sheet Profile

The job sheet applies:

- If you add new psychomotor-type (hands-on task) objectives.
- If a task or procedure changes due to new standards, new equipment, or safety requirements.

The job sheet gives learners step-by-step procedures for performing manipulative or psychomotor occupational tasks. It also records the instructor's evaluation of each learner's performance in terms of both the process and the product. *Each job sheet should be a valid task and reflect skills needed for employment or course completion.*

Each job sheet should include the following elements:

■ **Objective.** Each job sheet should match a specific objective from the cover sheet/objective sheet. The objective should be an exact restatement of the objective number and text as it appears on the cover sheet/objective sheet.

■ **Introduction.** This is a short lead-in to the procedure. It can describe the context of the task, its importance in the workplace, its relationship to other objectives, etc.

■ **Equipment and Supplies.** This is a list of the required resources the learner needs to perform the task.

   Examples: tools, lab equipment/supplies, utensils, personal protective equipment, manufacturers' manuals

- **Procedure.** This section lists the numbered steps to perform the task. It is written in the form of statements to the learner. Diagrams, illustrations, and photographs may be included as needed to assist the learner in performing the task.

- **Skill Test Record.** This section serves as the evaluation record. It provides space for the instructor to comment on the learner's performance. It also lists the criteria the instructor will use to rate the learner's performance of the task.

Example:

SKILL TEST RECORD

Evaluator note: Rate the learner on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate mastery. (See Key below.) A learner who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:

4	3	2	1	Product meets manufacturer's installation specifications
4	3	2	1	Product meets manufacturer's adjustment specifications
4	3	2	1	Product includes proper components/materials
4	3	2	1	Product meets performance requirements
4	3	2	1	Product appearance meets industry standards

Evaluator note: To obtain an average rating for the Profile of Training Mastery, total the points in Product Evaluation and divide by the total number of criteria. Circle the rating on the Key below.

4 Skilled — Can perform job with no additional training
3 Moderately Skilled — Has performed job during training program; limited additional training may be required
2 Limited Skill — Has performed job during training program; additional training is required to develop skill
1 Unskilled — Is familiar with process, but is unable to perform job

EVALUATOR'S COMMENTS:

2: Developing Performance Test Items

- The precise behavior called for in the performance objective for a task should also be required for the performance test.

- If a *process* is critical to performing the task competently on the job, the performance test (job sheet) must include items that assess how the learner performs the task. Someone must actually observe the learner, at least during the key steps.

    Example: Include boxes beside each process step for the observer to check off or to rate.

- If producing a completed *product* is important to be competent, the performance test must include product-related items and the finished product must be subject to critical evaluation.

    Example: Include the criteria that describe an acceptable product, such as in a rubric.

- If both process and product are important, include items to assess both.

    Example: Include the process steps in order and with check-off boxes for the observer, as well as a rubric that describes the acceptable product upon completion of the process.

- Several evaluators/observers using a performance test should rate a single learner's performance in a very similar way.

- Consider whether the learner should repeat a task multiple times, possibly under varying conditions or separated by time, or both.

- Each learner should perform each task independently. Administering performance tests to a group assesses only the competence of the group.

3: Hazard Alerts in Performance Tests

Include appropriate hazard alerts where needed in performance tests (job sheets). If used, they should appear before the learner performs the step being warned about. When the same alert is needed in multiple places, use the same wording in each alert. Choose the appropriate alert as follows:

DANGER—Use if the situation will lead to death or serious injury if not avoided.

WARNING—Use if the situation could lead to death or serious injury if not avoided.

CAUTION—Use if the situation could lead to minor or moderate injury.

NOTICE—Use if the situation could cause property damage only.

IMPORTANT—Use to refer to operating or maintenance tips.

4: Job Sheet Guidelines

- Restate and number the job sheet objective exactly as it appears on the module cover sheet/objective sheet.

- In the **Introduction**, consider information such as the following:

  o Technical or procedural information that applies to the specific activity;
  o Explanatory information about the procedure or activity that would not be known otherwise;
  o Hazard alert or cautionary information for special emphasis; and/or
  o The context of the procedure, its importance in the workplace, and its relationship to other objectives.

- Arrange the items in the **Equipment and Supplies** list in a logical order.

  Examples: alphabetical order, logical groupings, items for checkout, and personal (consumable) items

- In the **Procedures** section:

  o State each step in the second-person form (directly to the learner).
  o Begin each instruction with a verb (as with a command).
  o Make sure process steps are observable, measurable, clear and concise, and cover major component procedures.
  o Include appropriate hazard alerts where needed.

- Number the steps in the procedure.

- For the **Skill Test Record**:

  o Identify appropriate and objective criteria to evaluate the *product* of the job sheet task.
  o For the product evaluation criteria, identify the rating scale that applies.

    Example: You could use a scale from 1 to 4, with "1" meaning "Unskilled" and "4" meaning "Skilled."

5: Job Sheet Checklist

The following checklist will help you create a job sheet for a self-paced learning module. You will outline what could become a job sheet. You can then apply this skill to the other modules in your curriculum/program.

Respond to each item. Review this checklist later as a starting point for creating a job sheet.

1. Review the specific objectives you listed for the cover sheet/objective sheet checklist.

2. Determine whether you must develop a new job sheet:

    A. Do your existing learning resources already include all of the necessary hands-on tasks/procedures? If Yes, then you probably do not need to develop a job sheet.

    B. Do any of the following apply? If Yes, then you may need to develop one or more job sheets:

        *   Add new psychomotor-type (hands-on task) objectives?
        *   Task or procedure changes (due to new standards, new equipment, safety requirements, or other changes)?

3. If (2.B) applies, write the objective for the needed job sheet.

4. Write a sample Introduction for the job sheet. Write three to five sentences that address:

    *   Technical or procedural information that applies to the specific task;
    *   Explanatory information about the procedure or task that would not otherwise be known;
    *   Hazard alert or cautionary information for special emphasis; and/or
    *   The context of the procedure, its importance in the workplace, and its relationship to other objectives.

5. What equipment and supplies are needed to perform the task? List the items.

6. How would you instruct learners to complete the task? Write the steps in the procedure.

    Note: You could use your smartphone to make a rough video as you perform the task, then review the video as you write out the individual steps for learners to follow.

7. Identify resources you could use to develop the job sheet.

    Examples: personal expertise, guides and manuals, photos, videos

8. Identify the criteria appropriate to evaluate each learner's completed task. List the criteria.

Module 8
Writing the Pretest/Posttest

Objectives

1. Distinguish between cognitive testing and performance testing.
2. State advantages and limitations of cognitive test item types.
3. State guidelines for developing cognitive test items.
4. "Decode" common test terms to improve learners' understanding.
5. Explain how to write multiple-choice test items.

1: Cognitive and Performance Testing

■ **Cognitive testing**—Evaluation of the cognitive objectives in a "body of knowledge" (a module)

- Allows for evaluation of the enabling competencies for performance tasks.
- Allows for match between test item and desired competency level.
- Contributes to alignment among objectives, content, and evaluation.

Cognitive testing is achieved through a pretest/posttest that covers the cognitive objectives in a unit/module. The pretest/posttest can be in written form or can be interactive as a feature of a school's learning management system (LMS).

You can adopt, adapt, or develop a pretest/posttest for each unit/module of instruction:

- **Adopt existing tests.** You may be using tests that are already aligned with the objectives in your learning units/modules. If so, you can use them "as-is" for pretests/posttests.

  Examples: CIMC curriculum includes unit tests that are aligned to specific objectives. Many have multiple-choice unit tests. Some publishers' textbooks may also include a test item bank or other tests that might be well aligned. They could be suitable as pretests/posttests.

- **Adapt existing tests.** You may be able to supplement or change unit/chapter tests in textbooks and other resources to ensure they align with objectives.

- **Develop new tests**. If you can't find existing tests to adopt or adapt, you must create your own tests to use as pretests/posttests.

Note: If you notice an error in an LMS-based test, do not change any questions or answers while the test is active. Instead, make the changes after all learners have completed it, or create a new copy of the test.

■ **Performance testing**—Evaluation of a process and the resulting product:

- May offer a more accurate picture of the learner's achievement (mastery).
- May be only measure appropriate for some skills and abilities.
- Allows for observable skill practice.
- Applies knowledge.

Performance testing is achieved through the job sheet. If a process is important, someone must observe it. If a product is important, key criteria must be identified and checked. The learner usually completes a performance test in front of the instructor or other qualified authority who can assess the process and the resulting product. (See Module 7.)

Note: When conducting assessments on an LMS, keep a printable copy stored in the course files hidden from the learners' view, in the event learners need the test to be read aloud.

2: Advantages and Limitations of Cognitive Test Item Types

n addition to the following types of test items for cognitive tests, you may have additional options in a learning management system (LMS), such as drag-and-drop assessment items and others.

Table 5
Advantages and Disadvantage of Various Test Item Types

Test Item Type	Advantages	Limitations
Multiple choice	• Eliminates subjective scoring. • Reduces guessing. • Is versatile—can be used to measure recall of knowledge or application of principles.	• Is difficult to write good items. • Is sometimes hard to find good options. • Requires longer learner response time than true-false items.
Matching	• Can test large amount of factual information in a relatively short time. • Eliminates subjective scoring. • Is useful in assessing learner's ability to match words with definitions, events with places, concepts with words or symbols, etc.	• Is often difficult to develop a good set of matching items.

Table 5 *(Continued)*

Test Item Type	Advantages	Limitations
True-false	• Allows the teacher to ask questions about a large content area in a short amount of the learner's time. • Eliminates subjective scoring. • Is a realistic task for many learners because they are often asked to judge the truth of a statement in real life	• Encourages learner guessing. • Is often misused to test unimportant or highly specific information. • Is fairly limited to recall of information. • Is difficult to construct good, unambiguous items.
Short answer and essay	• Is relatively easy to construct. • Can measure more types of complex achievement. • Can place emphasis on larger units of instruction. • Requires the learner to organize an original response. • Reduces possibility of learner's guessing correct answer.	• Is time-consuming to score. • Limits the area to be tested since more time is required for each learner response. • Is difficult to score objectively. • Confounds the learner's ability to communicate in writing with the actual ability to answer the question.
Completion	• Reduces the chances of the learner's guessing the correct response. • Is relatively easy to construct.	• May not be as objective to score as multiple choice, true-false, or matching. • Is limited to recall of information rather than application of principles in new situations.

3: Developing Cognitive Test Items

Multiple Choice

- If the learner must select the best answer, be sure that only one answer is clearly the best.
- Write the test item so that most of the words are in the stem, not in the options.
- Avoid using negative expressions in the stem and in the options.
- All answer options should be reasonable, practical, and appealing to the learner who does not know the correct answer.
- The correct answer option should not be obviously shorter or longer than the other options.
- Make the answer options grammatically consistent.
- Order the answer options within a test item in a logical way (alphabetical, numerical).

Matching

- The list of premises and responses can be equal or unequal in length.
- Indicate clearly in the directions how the matching is to be done.

  Examples:
  "Draw a line between each term and its definition."
  "Write the letter of each component in the right column beside the number of its function in the left column."

- Arrange the premises and responses in a logical order.
- Include responses that match no premises, responses that match more than one premise, or both.
- Keep the lists of premises and responses short (about 10 items in each list).

True-False

- Write items that are true or false without additional qualifiers. Do not use true-false items where the item could be considered true (or false) under certain circumstances, unless the circumstances are identified in the statement.
- Keep true-false statements short and limited to one idea.
- Make sure your answers reveal no pattern. Vary the amount and order of the true and false statements within each test and across all tests.
- Avoid using these words in false statements; they give the answer away to learners who do not know the correct answer: only, never, all, every, always, no, and none.
- Avoid using these words in true statements; they give the answer away to learners who do not know the correct answer: usually, generally, sometimes, often, may, could, and frequently.

Short answer and essay

- Be very clear in the question. Identify exactly what you want the learner to respond to and in what level of detail. Do not ask broad, ambiguous questions.
- Compile a list of exactly what is required in the learner's answer. Write down all of the major and minor points to be addressed. Use this list in grading each answer.
- If the purpose is to test what the learner knows in relation to a performance objective (a hands-on task or objective), do not downgrade a response for poor handwriting or spelling. However, if handwriting and/or spelling are a part of the criteria for mastery of the objective—as may be the case with completing a work order form, for example—then tell the learner that handwriting and/or spelling will be considered.

Completion

- Design the question or statement so that there is only one correct answer.
- Do not take statements or sentences directly from a copyrighted source.
- Do not break up a sentence by removing words and replacing them with blanks to the point that the meaning of the sentence is lost.
- Place the blank(s) at the end rather than the beginning of a sentence.
- Leave enough room for the learner to write in the correct response.
- Leave out unnecessary hints, such as the first letter of the missing word.
- Tell the learner the units to use in the answer (inches, centimeters, cups, etc.).

Note: Formatting multiple-choice questions in a quiz engine allows for the shuffling of answer choices. However, avoid shuffling the choices if using "All of the above," "None of the above," or "b and c only" answers. You also may consider using multiple-correct-type questions instead of multiple-choice.

4: "Decoding" Test Terms

Many learners have difficulty taking a test because they simply do not understand the test terms. Make sure your learners understand the meanings of these 20 common test terms:

Compare	find how two or more things are alike
Contrast	find how two things are different
Criticize	tell about the value of something
Define	give a clear meaning
Diagram	make a drawing or chart, label all parts
Discuss	look at good and bad points and give detailed answer
Enumerate	give your answer in outline form
Evaluate	like discuss, but you use more of your own opinion
Explain	tell how and why about a subject
Illustrate	a written answer using a drawing or chart
Interpret	explain; tell how and why about a subject
Justify	prove answer
List	enumerate or put answer down point by point
Outline	a systematic writing of major and minor points
Prove	show evidence or proof about something
Relate	compare; show similar points
Review	critically examine and comment on major points
State	tell main points
Summarize	tell main points
Trace	follow event from beginning to end, emphasize main point

5: Writing Multiple-Choice Test Items

Multiple-choice questions consist of a stem, options (distractors), and a key.

What is the leading cause of death in the 15 to 24 age group? ⇐ **stem**

key ⇨* A. accidents
        B. cancer   ⇐ **options (distractors)**
        C. heart disease
        D. respiratory disease

1. **Stem**—A question or an incomplete statement that presents the problem. The stem may be presented either as a question or as an incomplete statement. The choice of form makes no difference in the overall effectiveness of the stem, as long as you present a clear and specific problem. An example of the two different types of stem forms appears below:

Sample Stem Written as a Question:

Which of the basic food groups is richest in calcium?

        A. breads and grains
     *B. dairy products
        C. fruits and vegetables
        D. meat and poultry

Sample Stem Written as an Incomplete Statement:

An example of a supply-type test item is the:

        A. multiple-choice item
        B. true-false item
        C. matching item
     *D. short-answer item

2. **Options (distractors)**—The answer choices or options, referred to as distractors, given to provide possible solutions to the problem. They function to distract learners who are uncertain of the answer. Typically, there are four options that consist of one correct answer (the key) and three distractors.

3. **Key**—The correct or best answer.

The goal of the multiple-choice item format is to present learners with a task that is both important and clearly understood, and that can be answered correctly by anyone who has achieved the intended learning outcome. There should be nothing in the content or structure of the item that would prevent an informed learner from responding correctly. Similarly, nothing in the content or structure of the item should enable an uninformed learner to select the correct answer.

The following rules can guide you as you write multiple-choice test items that function as intended.

Developing the Stem

1. **Present a single, clearly formulated problem in the stem of the item.** The stem should contain only information that is pertinent to the question or problem. The stem should be worded so that the learner can understand it without reading the options.

> **Poor**: The cell islets of the pancreas:
>
>   A.   are located around the edge of the pancreas.
>   B.   contain ducts.
>   C.   disappear as one grows older.
>   ***D.**   produce insulin.
>
> **Better**: The cell islets of the pancreas secrete the substance called:
>
>   A.   trypsin.
>   ***B.**   insulin.
>   C.   tryptophan.
>   D.   adrenaline.

The first example is simply a collection of true-false statements with a common stem. However, the stem in the second example presents a single problem. A good test to check the clarity and completeness of a multiple-choice stem is to cover the alternatives and determine whether it could be answered without the choices.

2. **State the stem of the item in simple, clear language.** The problem in the stem should be stated clearly, using straightforward vocabulary and should be free of unnecessary complex wording and sentence structure.

Poor: Cells of one kind belong to a particular group performing a specialized duty. We call this group of cells a tissue. All of us have different kinds of tissues in our bodies. Which of the following would be classified as epithelial tissue?

    A. adenoids and tonsils
    B. cartilage
   *C. mucous membranes
    D. tendons

Better: Which of the following would be classified as epithelial tissue?

    A. adenoids and tonsils
    B. cartilage
   *C. mucous membranes
    D. tendons

The stem in the first example contains unnecessary material that increases the amount of reading needed for an item, making it more difficult for the learner to distinguish between relevant and irrelevant material.

3. **Put as much of the wording as possible in the stem of the item.**

The stem should include as much of the item as possible. If the same words or phrases appear in all or most of the options, rewrite the stem to include the repetitious material. Note the following examples:

Poor: In *objective* testing, the term objective:

    A. refers to the method of identifying the learning outcomes.
    B. refers to the method of presenting the problem.
    C. refers to the method of selecting the test content.
   *D. refers to the method of scoring the answers.

Better: In *objective* testing, the term objective refers to the method of:

    A. identifying the learning outcomes.
    B. presenting the problem.
    C. selecting the test content.
   *D. scoring the answers.

4. **State the stem of the item in positive form, wherever possible.**

Avoid using negatives such as NO, NOT, and EXCEPT. If you must use a negative word, write it in capital letters and underline it so that the learner (the test-taker) will not miss it.

Poor: Which of the following structures of the ear is NOT concerned with hearing?

    A. cochlea
    B. eardrum
    C. oval window
  *D. semicircular canals

Better: Which one of the following structures of the ear helps to maintain balance?

    A. cochlea
    B. eardrum
    C. oval window
  *D. semicircular canals

Poor: Which one of the following is not a desirable practice when preparing multiple-choice items?

  *A. Shortening the stem by lengthening the alternatives.
    B. Stating the stem in positive form.
    C. Underlining certain words in the stem for emphasis.
    D. Using a stem that could function as a short-answer item.

Better: All of the following are desirable practices when preparing multiple choice items EXCEPT:

  *A. shortening the stem by lengthening the alternatives.
    B. stating the item in positive form.
    C. underlining certain words in the stem for emphasis.
    D. using a stem that could function as a short-answer item.

When negative wording appears in the stem of an item, not only should it be emphasized by placing it in capital letters and underlining it, but also placed near the end of the statement.

5. **Make certain that the intended answer is correct or clearly best.**

When the correct-answer form is used, there should be only one unquestionably correct answer. With the best-answer form, the intended answer should be one that content experts would agree is clearly the best.

Poor: Which of the following types of cattle is a dairy breed?

     A. Angus
  *B. Guernsey
     C. Hereford
  *D. Holstein

Better: Which of the following types of cattle is a dairy breed?

     A. Angus
     B. Brahman
     C. Hereford
  *D. Holstein

In the first example, both B and D are correct answers. They both are dairy breeds of cattle. In the second example, the only correct answer is D. All of the other options are breeds of meat cattle.

Developing the Options

1. **Make all options grammatically consistent with the stem of the item and parallel in form.**

Be sure to check the options against the wording in the stem to make sure they are grammatically consistent. This will help to avoid easy elimination of options.

> **Poor:** Penicillin is obtained from a:
>
> > A. bacteria.
> > B. coal-tars.
> > *C. mold.
> > D. tropical tree
>
> **Better:** Penicillin is obtained from:
>
> > A. bacteria.
> > B. coal-tars.
> > *C. mold
> > D. tropical tree

In first example, *a coal-tars* is not grammatically correct when the stem and the option is read as a complete sentence.

2. **Avoid giving clues in the correct answer by providing common verbal associations to words that are in the stem.**

> **Poor:** What is the best way to locate a lawyer for assistance?
>
> > *A. Contact a lawyer referral service.
> > B. Contact a police officer.
> > C. Look for an ad in the newspaper.
> > D. Wait until you go to jail.
>
> **Better:** What is the best way to locate a lawyer for assistance?
>
> > A. Ask a police officer.
> > B. Call a bail bonding agency.
> > *C. Contact a legal referral service.
> > D. Look for an ad in the phone book.

Note that in the first example, the word *lawyer* appears in both the stem and the correct answer.

3. Be sure that the wrong answers are plausible.

The distractors must be attractive to learners who are lacking in knowledge about the material the item is intended to assess. Therefore, the incorrect answer choices should be logically consistent with the stem and should represent common errors made by learners at a particular ability level.

Poor: Subtract   8032
               - 5743

        *A. 2289
         B. 2288
         C. 2378
         D. 3378

Better: Subtract   8032
               -5743

        *A. 2289
         B. 2389 [failing to change 0 to 9]
         C. 3399 [failing to decrease two digits borrowed from]
         D. 3711 [subtracting the big number from the small one]

4. Vary the relative length of the correct answer to eliminate length as a clue.

All options should be of approximately the same length. Avoid any tendency to make the correct answer consistently longer or shorter than the distractors.

Poor: One advantage of multiple-choice items over essay questions is that they:

        A. depend more on recall.
        B. measure more complex outcomes.
      *C. provide for a more extensive sampling of course content.
        D. require less time to score.

Better: One advantage of multiple-choice items over essay questions is that they:

        A. place greater emphasis on the recall of factual information.
      *B. provide for a more extensive sampling of course content.
        C. provide for the measurement of more complex learning outcomes.
        D. require less time for test preparation and scoring.

5. **Use the option "none of the above" only when the answer can be classified unequivocally as correct or incorrect.**

The "none of the above" option works better when the stem is stated as a question rather than a sentence to be completed. An incomplete sentence rarely works because "none of   the above" seldom completes the stem grammatically. Nevertheless, the use of the "none of the above" option should be avoided.

6. **Avoid using "all of the above."**

The "all of the above" option makes it possible to answer the item on the basis of partial information. Since the learner is to select only one answer, they can detect "all of the above" as the correct choice simply by noting that two of the alternatives are correct. They can also detect it as a wrong answer by recognizing that at least one of the alternatives is incorrect, thus enhancing their chance of guessing the correct answer from the remaining choices. You may consider using multiple-correct-type questions instead of multiple-choice.

Poor: Which of the following factors must be considered in computing basal energy requirements?

      A. age
      B. height
      C. weight
    *D. all of the above

Better: Which of the following factors must be considered in computing basal energy requirements?

      A. age only
      B. weight only
      C. height and weight only
    *D. age, height, and weight

7. Alphabetize the distractors and arrange numerical options in ascending order.

To ensure that the placement of the correct answer, or key, does not follow a pattern that may be apparent to the learner, the options should be listed in alphabetical order. If the options are numerical, then the options should be listed in ascending order.

Poor: A communication system for the blind that includes raised dots that are arranged to represent letters of the alphabet is called:

  *A. Braille
   B. Sign language
   C. Morse code
   D. Arabic lettering

Better: A communication system for the blind that includes raised dots that are arranged to represent letters of the alphabet is called:

   A. Arabic lettering
  *B. Braille
   C. Morse code
   D. Sign language

Poor: How long should you feed an orphan calf warm whole milk?

   A. 14 days
   B. 21 days
  *C. 10 days
   D. 28 days

Better: How long should you feed an orphan calf warm whole milk?

  *A. 10 days
   B. 14 days
   C. 21 days
   D. 28 days

Module 9
Creating the Answer Sheet

Objective

1. Profile the answer sheet.

Answer Sheet Profile

The answer sheet lists the answers to each of the assignments in each self-paced learning module. It may also list the answers to each pretest/posttest. Include the pretest/posttest answers on the answer sheet for each module if the learner will check his/her own answers. If you will check each learner's answers, then you may prefer leaving the pretest/posttest answers out of the answer sheet!

The answer sheet should include the following elements:

■ **Program Title**—The program title should identify the larger program to which the module belongs.

Example: Building and Grounds Maintenance

■ **Module Title**—The module title should be the same as a unit or chapter title in your curriculum (unless you are creating all of the contents of a module). It should also include the module reference number that follows the numbering system for modules at your school.

Example: BGM A-1: Orientation to Building and Grounds Maintenance

■ **Assignment Answers**—This section should list the answers to each of the numbered assignments in the module.

■ **Pretest/Posttest Answers**—This section lists the answers to the module pretest/posttest. If you are using a test item bank provided with your instructional materials (such as a textbook from a commercial publisher), you may prefer to refer learners to the appropriate answer component.

■ **Other**—As determined by the format for self-paced learning modules at your school.

Example: Reference to latest revision date.

Appendix

SYLLABUS FOR [COURSE TITLE]

Instructor's Name
Room or Office Number
Email Address

1. COURSE DESCRIPTION
   Write a short paragraph describing the course.

2. METHOD OF INSTRUCTION
   Write a paragraph describing the delivery format for lectures, lab activities, group discussions, online activities, and other primary form of instruction; frequency or number of interim exams/quizzes; reading requirements; hands-on activities; and field trips.

3. COURSE OBJECTIVES [list several]
   1.
   2.
   3.
   4.
   5.

4. ANTICIPATED SCHEDULE (list all topics/units for the duration of the course)
   - Topics/units by week, including a description of assignments and activities
   - Due dates of homework and assignments
   - Exam dates
   - Additional activities, such as field trips

5. TEXTBOOK(S) AND REQUIRED TOOLS OR SUPPLIES
   - Required textbook [list the title, edition, author(s), and ISBN]
   - Supplies, equipment, and technology needed
   - Optional or recommended resources

6. GRADING PLAN
   - Specify whether you're using a letter-grade or a point system
   - Explain weight given to course components, such as attendance, quizzes, online discussions, and final exams; in a competency-based course, explain the mastery level required for knowledge or skills

     Note: Use rubrics to reduce subjectivity when grading difficult-to-quantify assignments or participation.

7. POLICIES AND PROCEDURES
    1. Describe conditions for accepting late homework assignments, expectations for attendance and class participation, allowances for make-up exams, consequences for plagiarism, etc.
    2. Classroom and lab safety requirements
    3. Emergency procedures