

The Learning and Training specialization

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DITA L&T specialization overview

- Explain the L&T specialization and its role in creating instructional materials
- List the benefits of using the L&T specialization
- Discuss applications for the L&T specialization
- Describe how the L&T specialization supports curriculum development

Housekeeping and sample files

To view the sources for some of the examples in this course, download [learning_and_training_samples.zip](#) now. Extract the contents and put them in a directory that you can access easily. If you have access to an output generator (usually the DITA Open Toolkit), you can use it to generate output and see these principles in action.

The lessons will instruct you on which files to use for the samples.

Create a local copy of each file to work in as you complete the lessons. That way, if you reach a point where your working file doesn't match the examples, or is broken for any reason, you can make a fresh copy and resume your work or start over.

In the instructions and examples, we show you the DITA code for the sample files. Most DITA editors have auto-complete or other similar features to guide you through the process of adding elements (for example, if you type the opening tag of an element, most DITA editors will automatically add the closing tag for you). Therefore, you will probably not need to create every piece of code from scratch as you work.

What is in the L&T specialization?

The DITA Learning and Training (L&T) specialization is a set of DITA topic types and elements for instructional content (including courses like this one).

You use the L&T topic types to plan your learning content, list objectives, author content, create review materials, and create assessments.

L&T maps organize learning topics into sets of learning objects and group those learning objects into lessons. These learning objects allow you to reuse groups of learning material as well as individual topics.

Benefits of using the L&T specialization

The L&T Specialization allows training content to be used in multiple ways. For example, a learning assessment topic could be used as a test for students, and also contain conditional information for instructors, such as answer keys. One reusable set of topics can have multiple purposes by applying different transformation scenarios.

The L&T specialization, like the rest of DITA, uses semantic elements, meaning that the names of the elements give insight to how they are used. For example, the `<table>` element indicates that the elements contain the contents of a table. In the L&T specialization, the semantic elements are specific to the specialization: the `<learningOverviewbody>` element contains the body of a `<learningOverview>` topic.

The `<learningObject>` element within the L&T map types allows you to group learning topics together into one learning object. Learning plans, overviews, contents, assessments, and summaries for one lesson can be grouped together into one learning object.

The `<learningObject>` element also allows you to add any DITA content, even if it was not created using L&T topics.

L&T Specialization use cases

Here are just a few use cases for the DITA Learning & Training specialization:

- Developing content for instructor-led training. You can use the Learning & Training specialization to create the slides for the presentation as well the printed materials handed out to students, including: course outlines, workbooks, review materials, and pre- and post-assessments.
- Developing content for e-learning. Just as Scriptorium does for LearningDITA, the Learning & Training specialization allows you to prepare and organize learning content and assessments for the web.
- If the training and other content creating teams use DITA, all teams can develop and share content between the groups. While actual presentation and discussion of materials might take different forms, both groups can share common blocks of text, images, tables of data, etc.

L&T and curriculum development

The L&T specialization enables you to create learning materials, including content and assessments, without modifications.

However, you might prefer a formalized approach, creating your content after careful planning and analysis. The L&T specialization includes a planning topic type that allows you to identify goals, needs, and objectives. The `<learningGroup>` and `<learningObject>` elements allow you to use planning topic types at many levels of your development.

In addition, the L&T specialization allows you to create learning objects (objective, content, assessment).

The L&T specialization provides many elements for instructional content. It does not enforce a particular instructional design approach; you can pick and choose the elements that you want and adapt the model to your requirements. Transforming the content into materials, exams, or e-learning content is entirely up to you. While you can use the DITA Open Toolkit to generate a PDF, RTF, and other standard formats, there is no plug-in that can replace a learning management system.

Assessment

Answer the following questions to check how well you understand the concepts in this lesson.

Specializations

Q 1. You must create specializations for elements in order to write an assessment.

- A. True
 B. False

LMS

Q 1. When you are finished writing your course you can use the DITA OT e-learning plug-in to transform your content.

- A. True
 B. False

Benefits

Q 1. Select all of the following reasons you might want to use the L&T specialization.

- A. You want to create a task topic.
 B. You are developing content for instructor and student materials.

- C. You are developing training content for print and online media.
- D. You need to incorporate previously written DITA content into a new course.

DITA Compatible

Q 1. The L&T specialization is compatible with other DITA topics.

- A. True
- B. False

The L&T topic types

- Define all of the L&T topic types.
- Understand when to use each topic type.
- List basic elements of each topic type.

The DITA L&T specialization defines five topic types that contain different types of course information:

- `<learningPlan>`: provides a framework for planning learning content.
- `<learningOverview>`: contains overall learning objectives and specifics for a course, such as audience, duration, and prerequisites.
- `<learningContent>`: contains the actual learning content.
- `<learningSummary>`: contains review materials.
- `<learningAssessment>`: contains exercises, quizzes, or tests.

These topic types describe a wide range of information. Not everyone will use all of these topic types. For example, the source content for LearningDITA lessons do not use the `<learningPlan>`, `<learningOverview>`, or `<learningSummary>` elements. However, your course development process may require those elements.

This lesson provides an overview of each topic type.

The `<learningPlan>` topic type

The `<learningPlan>` topic type helps you organize information for planning lessons. This information includes:

- Project description, including the title, dates, and subject.
- Needs analysis, including organizational needs, audience needs, and the required environment for delivering the training
- Approaches and strategies for teaching the content.
- Technical requirements, such as the classroom environment or what type of learning management system (LMS) will contain the content

You specify the preceding information with the elements of the `<learningPlan>` topic. For example, to specify the description for a course, use the `<lcPlanDescrip>` element, which can contain paragraphs and unordered lists:

```
<lcPlanDescrip id="lcPlanDescrip_dnw_3bs_rcb">
  <title>Course Description</title>
  <p>This course is intended for owners of small- to medium-
sized flocks of domestic ducks. Topics covered include:</p>
  <ul>
    <li>Feed Quality<ul id="ul_i2d_lds_rcb">
      <li>Source</li>
      <li>Protection</li>
      <li>Contamination and spoilage</li>
    </ul>
  </li>
</ul>
```

```

        </ul></li>
        <li>Feed Form</li>
        <li>Feeders and waterers</li>
        <li>Nutritional requirements</li>
        <li>Controlling disease</li>
        <li>Avoiding predation</li>
    </ul>
</lcPlanDescrip>

```

Even though the L&T specialization contains elements exclusively for training content, these elements can contain DITA elements you use elsewhere in concept, task, and reference topics. The `` within the `<lcPlanDescrip>` is a good example.

Related information

[DITA version 1.3 specification, learningPlan](#)

The `<learningOverview>` topic type

The `<learningOverview>` topic type contains objectives and prerequisites. It describes the learning objectives , course prerequisites , and intended audience .

In a `<learningOverview>` topic the main body-level element is the `<learningOverviewbody>`. This element can contain the following elements in this order:

1. `<lcIntro>`: introduction to the overview
2. `<lcAudience>`: facts about the students for whom the course is intended
3. `<lcDuration>`: estimated time to complete the course
4. `<lcPrereqs>`: any requirements for students before they take the course
5. `<lcObjectives>`: what students should gain from the course
6. `<lcResources>`: any resources used or extra information for the course

These elements may be followed by an unlimited number of `<section>` elements.

Here is an example of a `<learningOverviewbody>`:

```

<learningOverviewbody>
    <lcAudience id="lcAudience_rth_l4r_rcb">This course is intended
    for current or future owners of small- to medium-sized flocks of domestic
    ducks.</lcAudience>
    <lcDuration id="lcDuration_ohs_l4r_rcb">
        <lcTime value="3 weeks"/>
    </lcDuration>
    <lcObjectives id="lcObjectives_j3w_l4r_rcb">
        <lcObjectivesStem>At the end of this course, students will be able
        to:</lcObjectivesStem>
        <lcObjectivesGroup id="lcObjectivesGroup_cdr_2pr_rcb">
            <lcObjective>List the most important aspects of feed
            quality.</lcObjective>
            <lcObjective>Describe the common forms of feed and their pros
            and cons.</lcObjective>
            <lcObjective>List the physical requirements of feeders and
            waterers.</lcObjective>
            <lcObjective>Summarize macro and micro nutritional needs of
            ducks.</lcObjective>
            <lcObjective>List the four most common diseases in ducks and
            how they can be controlled by feeding.</lcObjective>
            <lcObjective>Identify the most common predators for ducks and
            how to limit predation</lcObjective>
        </lcObjectivesGroup>
    </lcObjectives>
</learningOverviewbody>

```

Related information

[DITA version 1.3 specification](#), [learningOverview](#)

The <learningContent> topic type

The <learningContent> topic type contains the actual learning content.

In a <learningContent> topic, the main element is the <learningContentbody> element. The <learningContentbody> element can contain the following elements:

1. <lcIntro>: introduction to the content
2. <lcDuration>: estimated time to complete the following content
3. <lcObjectives>: what students should gain from the content in the topic
4. <lcChallenge>: explanation of what you want the student to practice
5. <lcInstruction>: the bulk of instructional content

These elements may be followed by an unlimited number of <section> elements.

The <learningContent> topic also allows you to use content from DITA task, concept, and reference topics. You can nest these directly within the <learningContent> topic or add them using a map. We will discuss this in further detail in the <learningContent> lesson, but it means that you can reference previous material from outside of the L&T specialization. If you were creating a course from a previously written book, you could easily reference the existing DITA material to include in your course.

The <learningSummary> topic type

The <learningSummary> topic type contains review materials. This allows you to review the content and puts it in perspective with your learning objectives. This topic can also include instructions on what to do next.

In a <learningSummary> topic, the main body element is the <learningSummarybody>. The <learningSummarybody> element can contain the following elements:

1. <lcSummary> summary of the learned goals
2. <lcObjectives> completed objectives
3. <lcReview> review of the main content
4. <lcNextSteps> directions for after the course
5. <lcResources> related information to the course

These elements may be followed by an unlimited number of <section> elements.

Here is an example of a <learningSummarybody>:

```
<learningSummarybody>
  <lcSummary id="lcSummary_igg_jdl_scb">
    <p>To summarize the overview of Feeders and Waterers:</p>
    <ul id="ul_dhl_md1_scb">
      <li>The height of the feeders and waterers is important to the
ducks' development.</li>
      <li>Feeders and waterers must be kept as clean as possible at
all times.</li>
      <li>Feeder and waterer space is important for the development
of ducklings.</li>
      <li>Ducks' attraction to water can lead to wet litter
problems.</li>
    </ul>
  </lcSummary>
</learningSummarybody>
```


The <learningAssessment> topic type

The <learningAssessment> topic type contains exercises, quizzes, or tests. This information can be included before learning content as a preliminary test, or after content to re-enforce content or assess understanding.

The assessment type includes several interaction types that you can use to present questions. The interaction types include true-false, multiple-choice, open question, matching, sequence, and hot-spot (which allows the student to click on the designated area of an image). If these questions are meant for an interactive e-learning environment, it will require a specific output type as well as a learning management system (LMS).

The main body element is the <learningAssessmentbody> which can include <lcIntro>, <lcObjectives>, <lcDuration>, <lcInteraction>, <section>, and <lcSummary> elements. Questions types are included in the <lcInteraction> element.

Assessment

Answer the following questions to check how well you understand the concepts in this lesson.

learningPlan

Q 1. You must create a <learningPlan> in order to use the L&T specialization. (true/false).

- A. True
- B. False

LearningOverview

Q 1. Place these <learningOverview> elements in the correct order.

learningContent

Q 1. Which of the following topic types contain the <lcInstruction> element: (pick all that apply)

- A. <learningContent>
- B. <learningAssessment>
- C. <learningPlan>
- D. <learningInstruction>
- E. <learningSummary>

learningAssessment

Q 1. You use the <learningAssessment> topic type for quizzes, assignments, and other exercises (true/false).

- A. True
- B. False

learningAssessment 2

Q 1. Which of these topic types can include short-answer questions? (pick one)

- A. <learningPlan>
- B. <learningOverview>
- C. <learningAssessment>

D. `<learningSummary>`

E. `<learningContent>`

Learning content

- Describe the two common organizations of learning content.
- Properly order elements within the `<learningContentbody>` element.
- Give examples of when it is useful to use `<learningContent>` with an embedded topic.
- Author an embedded task topic in a `<learningContent>` topic.

The `<learningContent>` topic type will likely contain the bulk of your instructional course content.

The `<learningContent>` topic type

The `<learningContent>` topic type contains the instructional content of a course. Depending on how your course is structured, a `<learningContent>` topic can serve as a single topic within a lesson or a lesson within a course by organizing the `<learningContent>` topic within a map; or it can serve as an entire (short) course if you embed other topic types like a `<task>` or `<learningAssessment>` within one `<learningContent>` topic.

The instructional content is written in the main body element, `<learningContentbody>`, or it can be written in other DITA topics that can be nested within the `<learningContent>` topic.

The `<learningContent elements>`

The `<learningContent>` topic type contains the following elements:

`<learningContentbody>`: main element that contains the other elements within the body of this topic type; specialized from `<body>`; analogous to `<conbody>`, `<taskbody>`, etc.

`<lcInstruction>`: element within the `<learningContentbody>` for the instructional content in that lesson topic. Can include conceptual information, examples, activities, exercises, etc.

Other elements inside the `<learningContentbody>` include:

- `<lcIntro>`: introduces the lesson topic, often with a detailed description or instructor notes that `<shortdesc>` may not adequately cover
- `<lcDuration>`: estimates the length of time it should take the student to read all materials and/or complete all activities within the topic
- `<lcObjectives>`: lists specific objectives, or things the student should know/be able to do after completing the lesson topic
- `<lcChallenge>`: explains what you want the student to practice

`<learningContent>` with embedded topics

In addition to the `<learningContent>` elements, `<learningContent>` topics can contain embedded topics.

Your instructional content might include a series of steps for the student to follow to complete an activity. In this case, you can embed a task topic within the `<learningContent>` topic to handle these steps:

```
<learningContent id="watching_ducks">
  <title>Watching ducks</title>
  <learningContentbody>
    <lcInstruction>
```

```

        <p>Read this to learn more about what you need to have a
satisfying duck-watching experience.</p>
    </lcInstruction>
</learningContentbody>
<task id="how_to_watch_ducks">
    <title>How to watch ducks</title>
    <taskbody>
        <steps id="steps_watching_ducks">
            <step>
                <cmd>Choose a location to watch ducks.</cmd>
            </step>
            <step>
                <cmd>Pick a field guide to identify the ducks.</cmd>
            </step>
            <step>
                <cmd>Find some good optics.</cmd>
            </step>
        </steps>
    </taskbody>
</task>
</learningContent>

```

There are several benefits to embedding a topic within a `<learningContent>` topic:

- *Reuse.* If you need to reuse content in your training materials, embedding topics allows you to use that content as written rather than restructuring it into `learningContent`-specific elements. Embedding topics can be especially useful for training departments that reuse a lot of content from other departments, such as tech comm or sales.
- *Control.* The `<lcInstruction>` element in the body of a `<learningContent>` topic allows a limited element set. Embedding another topic type inside the `<learningContent>` topic allows you to use its element set instead. For example, you cannot use the `<steps>` element inside `<lcInstruction>` for step-by-step instruction, but the `<steps>` element is available inside an embedded task topic.
- *Flexibility.* You can embed more than one topic into the body of a `<learningContent>` topic, which adds flexibility to your `<learningContent>` topics; for example, you might embed a concept topic to explain an idea to your students, and then embed a task topic to provide hands-on instructions to enhance their understanding of that concept.

Exercise

1. Open the file `lesson3/lc_task_exercise_start.dita` and use it to convert the following content from [The DITA task topic type](#) LearningDITA course into a DITA `<learningConcept>` topic with an embedded task.

```

        <hr />
        <h3>Creating anew task topic</h3>
        <p>At a minimum, the task topic must contain a <task> root
element (with an id
        attribute) that contains a <title> element. </p>
        <p>Following the <title> element and an optional
<shortdesc> element, a
        <taskbody> element contains the task content. The
elements within the
        <taskbody> conform to a specific order. This course
presents the elements of the
        <taskbody> in the order in which they must occur. </p>
        <ol>
            <li>Make a copy of the file l_task_start.dita and open it in
your editor.
            <p>If you are using a DITA-aware text editor, make sure you
are in text
            mode, rather than author or visual mode. </p>
            </li>

```

```

        <li>Inside the <title> element, update the text of the
task title.</li>
        <li>After the <title> element, add a <taskbody>
element.
            <p>The <taskbody> element contains all the actual
content in the task.</p>
            <p>This is the essential part of a DITA strict task
topic. The rest of this
                lesson shows you how to add the first two child
elements to the
                    <taskbody> element.</p>
        </li>
<hr />

```

2. Check your file lesson3/lc_task_exercise_start.dita against the completed sample file lesson3/lc_task_exercise.dita

Assessment

Answer the following questions to check how well you understand the concepts in this lesson.

learningContent

Q 1. You can write instructional content in the main body element, `<learningContentbody>` and in other DITA topics that can be nested within the `<learningContent>` topic.

- A. True
- B. False

learningContentbody 2

Q 1. Properly match the following `<learningContentbody>` elements with their descriptions:

- | | | |
|----|------------------------------------|--|
| A. | <code><lcIntro></code> | ___ One or more items you will complete upon finishing the content |
| B. | <code><lcDuration></code> | ___ One or more practice statements that describe the reasons for the learning content |
| C. | <code><lcObjectives></code> | ___ Context for the topic |
| D. | <code><lcChallenge></code> | ___ Any additional learning information |
| E. | <code><lcInstruction></code> | ___ The estimated time for completion of the content |
| F. | <code><section></code> | ___ The learning activity content |

learningContentbody 3

Q 1. What is the **element** that contains most of your learning content? (pick one)

- A. `<learningContentbody>`
- B. `<lcMainsection>`
- C. `<lcObjectives>`
- D. `<learningContent>`

learningContent Topic

Q 1. To place an activity and learning content in the same topic you can (check all that apply):

- A. Embed a `<task>` topic within a `<learningContent>` topic.
- B. Use the `<lcInteraction>` element within the `<learningContentbody>`.

C. Write a `<learningContent>` topic within a `<task>` topic.

Required Elements

Q 1. Which of the following elements are required in the `learningContent` topic? (pick all that apply)

- A. `<lcObjectives>`
- B. `<learningContentbody>`
- C. `<title>`
- D. `<lcInstruction>`
- E. `<lcIntro>`

Embed Tasks

Q 1. When embedding a task within a `<learningContent>` topic, it should go within the `<learningContentbody>` element.

- A. True
- B. False

Elements for questions and responses

- Understand the uses of the `<learningAssessment>` topic.
- Use various elements to create different question types.
- Plan question formatting with DITA L&T standards in mind.

This lesson introduces you to the `learningDomain2`, which defines the elements you use for questions and responses within the `<learningAssessment>` topic.

Related information

https://www.oxygenxml.com/dita/1.3/specs/archSpec/learningTraining/lc-spec-Overview-domains.html#concept_cvq_vzc_ll_section_95070B5E06F6489A94C301B0D77DF71E

The `<learningAssessment>` topic type and interactions

A `<learningAssessment>` topic consists of assessment questions for students to answer. An assessment can be one question or a series of questions and can be placed before or after other learning content in a map. Assessments can act as pre-tests to place students or post-tests to verify students' retention of material.

This topic type is particularly helpful since it allows you to create content for student versions and answer keys simultaneously.

The main section of the topic goes within the `<learningAssessmentbody>` element. Within that, questions are contained in the `<lcInteracion>` element, but the body can also include other optional elements:

- `<lcIntro>`
- `<lcObjectives>`
- `<lcSummary>`

There are various types of questions that all interact differently. These interactions are defined in the `learningDomain2`, which is explained in detail in the next topic.

Interaction types

Interactions in the learningDomain2 can include the following parts:

- A question
- Images (optional)
- Correct and incorrect answer element tags
- Feedback for correct and incorrect answers (optional)

The bulk of the interaction will be the question content. Different types of questions have different elements:

- <lcTrueFalse2>: true-false question
- <lcSingleSelect2>: multiple-choice question with a single correct answer
- <lcMultipleSelect2>: multiple-choice question with more than one correct answer
- <lcMatching2>: two columns of information that students must match into related pairs
- <lcSequencing2>: a series of items that students must rearrange into the correct order
- <lcOpenQuestion2>: a question that requires a written answer (such as short answer or essay responses)
- <lcHotspot2>: an image with mapped regions on which students must click



Note: Notice the use of 2 as in learningDomain2, lcTrueFalse2, and so on. An earlier version of L&T used <learningDomain>. The <learningDomain2> elements are more flexible and allow block elements like <p> within question elements.

Below is an example of a single select question.

```
<learningAssessment id="la_l1_t1_ingredient_quality">
  <title>Ingredient quality</title>
  <shortdesc>Note that with an "all of the above" type answer, use the
lcSingleSelect2 interaction type, rather than lcMultipleSelect2. If you use
the lcMultipleSelect2 and a student selects all
    correct answers (with or without the "all of the above" selection),
most learning management systems (LMS) will mark this as an incorrect
response. </shortdesc>
  <learningAssessmentbody>
    <lcInteraction id="lcInteraction_sqg_xws_rcb">
      <lcSingleSelect2>
        <lcQuestion2>Do not use grains that are contaminated with:</
lcQuestion2>
        <lcAnswerOptionGroup2 id="lcAnswerOptionGroup2_skb_bxs_rcb">
          <lcAnswerOption2>
            <lcAnswerContent2>Molds</lcAnswerContent2>
            <lcFeedback2>Not just molds, but weed seeds and dirt
too.</lcFeedback2>
          </lcAnswerOption2>
          <lcAnswerOption2>
            <lcAnswerContent2>Weed seeds</lcAnswerContent2>
            <lcFeedback2>Not just weed seeds, but molds and dirt
too.</lcFeedback2>
          </lcAnswerOption2>
          <lcAnswerOption2>
            <lcAnswerContent2>Dirt</lcAnswerContent2>
            <lcFeedback2>Not just dirt, but molds and weed seeds
too.</lcFeedback2>
          </lcAnswerOption2>
          <lcAnswerOption2>
            <lcAnswerContent2>All of the above</lcAnswerContent2>
            <lcCorrectResponse2/>
          </lcAnswerOption2>
        </lcAnswerOptionGroup2>
      </lcSingleSelect2>
    </lcInteraction>
```

```

    </learningAssessmentbody>
</learningAssessment>

```

Practice

Now you can practice creating an assessment question.

1. Make a copy of the file `lca_practice_start.dita` and open it in your editor.



Note: If you are using a DITA-aware text editor, make sure you are in text mode, rather than author or visual mode.

You should see this:

```

<?xml version="1.0" encoding="utf-8"?>
    <!DOCTYPE learningAssessment PUBLIC "-//OASIS//DTD
DITA Learning Assessment//EN" "learningAssessment.dtd">
        <learningAssessment id="lca_practice">
            <title>Feed Quality Source</title>
            <learningAssessmentbody> </
learningAssessmentbody>
        </learningAssessment>

```

Notice that the `!DOCTYPE` declaration calls out the `learningAssessment` DTD.

After the required title is the `<learningAssessmentbody>`

2. Inside the `<learningAssessmentbody>` add the `<lcInteraction>` element and give it an `id` attribute.

```

<!DOCTYPE learningAssessment PUBLIC "-//OASIS//DTD DITA Learning
Assessment//EN" "learningAssessment.dtd">
    <learningAssessment id="lca_practice">
        <title>Feed Quality Source</title>
        <learningAssessmentbody>
            <lcInteraction
id="lcInteraction_practice">
                </lcInteraction>
        </learningAssessmentbody>
    </learningAssessment>

```

3. Now you can decide what type of assessment question you will add. For this practice exercise, add a `<lcMultipleSelect2>` question.

```

<!DOCTYPE learningAssessment PUBLIC "-//OASIS//DTD DITA Learning
Assessment//EN" "learningAssessment.dtd">
<learningAssessment id="lca_practice">
    <title>Feed Quality Source</title>
    <learningAssessmentbody>
        <lcInteraction id="lcInteraction_practice">
            <lcMultipleSelect2>
            </lcMultipleSelect2>
        </lcInteraction>
    </learningAssessmentbody>
</learningAssessment>

```

4. Next, you can add the question into the `<lcQuestion2>` element.

```

        . . .
        <lcMultipleSelect2>
            <lcQuestion2>Good commercially prepared duck feed can be found
where? (answer all that apply):</lcQuestion2>
        </lcMultipleSelect2>
        . . .

```

5. Now you can start adding the group of answer choices. First, add the `<lcAnswerOptionGroup2>` element and an id. Then, add the `<lcAnswerOption2>` element and the `<lcAnswerContent2>` element with the text of the first answer option.

```

      . . .
      <lcMultipleSelect2>
      <lcQuestion2>Good commercially prepared duck feed can be found
where? (answer all that apply):</lcQuestion2>
      <lcAnswerOptionGroup2 id="lcAnswerOptionGroup2_practice">
      <lcAnswerOption2>
      <lcAnswerContent2>Local feed stores.</
lcAnswerContent2>
      </lcAnswerOption2>
      </lcAnswerOptionGroup2>
    </lcMultipleSelect2>
    . . .

```

6. Now, if the answer option is correct, you can tag it as a correct answer choice.

```

      . . .
      <lcQuestion>
      <lcMultipleSelect2>
      <lcQuestion2>Good commercially prepared duck feed can be found
where? (answer all that apply):</lcQuestion2>
      <lcAnswerOptionGroup2 id="lcAnswerOptionGroup2_practice">
      <lcAnswerOption2>
      <lcAnswerContent2>Local feed stores.</
lcAnswerContent2>
      <lcCorrectResponse2/>
      </lcAnswerOption2>
      </lcAnswerOptionGroup2>
    </lcMultipleSelect2>
    . . .

```

You can add as many `<lcAnswerOption2>` elements as you need, and all of them can be tagged as correct.

7. Try adding another correct answer option.

```

      . . .
      <lcAnswerOptionGroup2 id="lcAnswerOptionGroup2_practice">
      <lcAnswerOption2>
      <lcAnswerContent2>Local feed stores.</
lcAnswerContent2>
      <lcCorrectResponse2/>
      </lcAnswerOption2>
      <lcAnswerOption2>
      <lcAnswerContent2>Mixed on the farm from bulk
ingredients.</lcAnswerContent>
      <lcCorrectResponse2/>
      </lcAnswerOption2>
    </lcAnswerOptionGroup2>
    . . .

```

8. To create an answer choice that is not a correct answer, just omit the `<lcCorrectResponse/>` element. Then, provide feedback by using the `<lcFeedback2>` element.(It will appear if the student chooses the wrong answer.)

```

      . . .
      <lcAnswerOptionGroup2
id="lcAnswerOptionGroup2_practice">
      <lcAnswerOption2>

```



```

        <lcAnswerContent2>Local feed stores.</
lcAnswerContent2>
        <lcCorrectResponse2/>
    </lcAnswerOption2>
    <lcAnswerOption2>
        <lcAnswerContent2>Mixed on the farm from bulk
ingredients.</lcAnswerContent>
        <lcCorrectResponse2/>
    </lcAnswerOption2>
    <lcAnswerOption2>
        <lcAnswerContent2>From the back of a stranger's
truck.</lcAnswerContent2>
        <lcFeedback2>The more you know about the source,
age, storage history, and the seller, the better off you are. The back of a
stranger's truck has none of this information.</lcFeedback2>
    </lcAnswerOption2>
</lcAnswerOptionGroup2>
. . .

```

Exercise

1. Now try an exercise on your own. Open the file `lesson3/lc_task_exercise_start.dita` and use it to convert the following content from [The DITA task topic type](#) LearningDITA course into a DITA `<learningAssessment>` topic. The answer choices are matched correctly in this preview.

```

        <hr />
        <h3>Question</h3>
        <p>Match the <choicetable> child elements with their uses.</p>
        <table>
            <tr>
                <td>&lt;chhead></td>
                <td>Header row</td>
            </tr>
            <tr>
                <td>&lt;chrow></td>
                <td>Body row</td>
            </tr>
            <tr>
                <td>&lt;choptionhd></td>
                <td>Option in a header row</td>
            </tr>
            <tr>
                <td>&lt;chdeschd></td>
                <td>Description in a header row</td>
            </tr>
            <tr>
                <td>&lt;choption></td>
                <td>Option in a body row</td>
            </tr>
            <tr>
                <td>&lt;chdesc></td>
                <td>Description in a body row</td>
            </tr>
        </table>
        <hr />

```

2. Check your file `lesson/lca_exercise_start.dita` against the completed sample file `lesson4/lca_exercise.dita`

Planning your interactions

Here are a few things to keep in mind when writing assessment questions in the L&T specialization:

- Use the objectives in your lesson or course as a starting point. This will help you write questions that test whether the student achieved the learning goals you intended.
- Avoid creating assessments that depend on other assessments. Questions can be displayed in a random order in your output. Therefore, writing a question that builds on a previous question is not practical.
- Just as the order of questions can be randomized, so can the order of the answer choices. Therefore, it's best to use a multi-select interaction type rather than a single-select with an "all of the above" answer choice, for example. If the order of your answer choices is important, see if that question might work best as a sequencing interaction type.
- When choosing an interaction type to frame your question, think about what you want students to prove they know. True/false or single-select interactions typically work best for testing their knowledge of facts, while matching or sequencing interactions may work better for testing their understanding of more complex concepts.

Assessment

Answer the following questions to check how well you understand the concepts in this lesson.

SingleSelect2

Q 1. Which element is the best fit for a question with a multiple-choice answer selection and only one correct answer? (pick one)

- A. <lcMultipleSelect>
- B. <lcSingleSelect>
- C. <lcSingleSelect2>
- D. <lcMultipleSelect2>
- E. <lcMultipleChoice2>

learningAssessment Order

Q 1. <LearningAssessment> topics must follow any <learningContent> topics in a learning map.

- A. True
- B. False

LearningAssessment Elements

Q 1. Correctly order the nesting of the following elements from a <learningAssessment> single select question.

Assessment Best Practices

Q 1. Creating a single select question with an “All of the Above” answer choice is a better alternative to making a multiple select question with every answer choice being correct.

- A. True
- B. False

Learning objects and learning groups

At the completion of this lesson, students will be able to:

- Describe the differences between the <learningObject> element and the <learningGroup> element.
- State why the individual reference elements are important to learning maps.
- Correctly construct a <learningGroupMap> and a <learningObjectMap>.

This lesson introduces you to the learning objects and learning groups, which you can use to organize L&T topics into courses, curricula, and other, larger structures.

Related information

http://ecolearnit.ifas.ufl.edu/documentation/concept_guide.pdf

Working with Learning Objects

The DITA L&T specialization was created with the reusable learning object, or RLO, approach to learning content in mind. This derived from work by learning content designers at Autodesk, Oracle, Cisco, and other companies. The idea is to create a collection of information objects that you can reuse and repurposed, depending on how you need to deliver your learning content.

A learning object is a “discrete reusable collection of content used to present and support a single learning objective.”

The Learning & Training specialization implements learningObjects with the <learningObject> element. The <learningObject> element inherits its behavior from the <topicref> element. It can contain references to the standard learning topics:

- Learning plan (only one per learning object)
- Learning overview topics
- Learning assessment topics (for pre- and post-testing)
- Learning content topics
- Learning summary topics

Learning Object elements

The <learningObject> element contains references to the topics that support the specific learning object. All of the reference elements inherit their behavior from the <topicref> element, but the L&T reference element names mirror the names of the topics that they reference.

A <learningObject> element can contain:

- An optional <learningPlanRef> element that indicates a learning plan topic.

If you're using the Learning Object Model, the learning plan topic should contain the needs and gap analysis, along with the approach and strategies for this specific content.

- Any number of <learningOverviewRef> and <learningPreAssessmentRef> elements.
 - The <learningOverviewRef> elements indicates learning overview topics.
 - The <learningPreAssessmentRef> element indicates learning assessment topics that are used as a pre-test or other initial assessment.
- One or more <learningContentRef> elements that indicate the learning content for this learning object.
- Any number of <learningSummaryRef> and <learningPostAssessmentRef> elements.
 - The <learningSummaryRef> element indicates learning summary topics.

- The <learningPostAssessmentRef> element indicates learning assessment topics that reinforce the learning or to assess what the student learned.

This is an example learning object from the Feeding Ducks example in your course materials:

```
<learningObject>
  <topicmeta>
    <navtitle>Topic 1</navtitle>
  </topicmeta>
  <learningPlanRef href="lp_11_t1_feed_quality.dita"/>
  <learningOverviewRef href="lo_11_t1_feed_quality.dita"/>
  <learningContentRef href="lc_11_t1_where_to_buy.dita"/>
  <learningContentRef href="lc_11_t1_storage.dita"/>
  <learningContentRef href="lc_11_t1_spoiling.dita"/>
  <learningContentRef href="lc_11_t1_ingredient_quality.dita"/>
  <learningSummaryRef href="ls_11_t1_summary.dita"/>
  <learningPostAssessmentRef href="lg_11_t1_quiz.dita"
type="learningGroup"/>
</learningObject>
```

Higher-level organization with learning groups

The <learningGroup> element allows you to build a lesson, a course, or even a curriculum by referencing multiple learning objects.

A learning group is similar in structure to a learning object. However, instead of containing references to learning content, the learning group can include:

- Other learning groups
- References to learning groups
- Learning objects
- References to learning objects

Because the <learningGroup> element can contain other <learningGroup> elements, it is quite flexible. However, its organization can also get quite convoluted. One possible way to reduce the complexity of the <learningGroup> element is to use references to learning groups and learning objects rather than directly including those elements.

Here is an example of a <learningGroup> element with learning topic and object references:

```
<learningGroup>
  <topicmeta>
    <navtitle>Feeders and Waterers</navtitle>
  </topicmeta>
  <learningOverviewRef href="lo_13_feeders_waterers.dita"/>

  <learningObject>
    <topicmeta>
      <navtitle>Feeders and Waterers</navtitle>
    </topicmeta>
    <learningOverviewRef href="lo_13_t1_feeders_waterers.dita"/>
    <learningContentRef href="lc_13_t1_height.dita"/>
    <learningContentRef href="lc_13_t1_cleanliness.dita"/>
    <learningContentRef href="lc_13_t1_ducklings.dita"/>
    <learningContentRef href="lc_13_t1_wet_litter.dita"/>
    <learningSummaryRef href="ls_13_t1_summary.dita"/>
    <learningPostAssessmentRef href="lg_13_t1_quiz.dita"
type="learningGroup"/>
  </learningObject>

</learningGroup>
```

Learning Maps

There are two learning map types that you use to collect learning objects and learning groups:

- The `learningObject` map type contains a single `<learningObject>` element.
- The `learningGroup` map type contains a single `<learningGroup>` object.

Both the `learningObject` map and `learningGroup` map are specializations of the base DITA map type. The content models in the DITA 1.3 Specification indicate you can use many of the map elements in these types, but the intent is that they should contain a single learning group or learning object element. The specification does allow you to use `<topicref>` elements to reference keymaps and other supporting content.

In practical terms, this means that most output transforms will only expect a single learning group or learning object element. You might be able to add additional map elements, but you cannot expect that they will be handled correctly by all processors.

A learning object map has this structure:

```
<!DOCTYPE learningObjectMap PUBLIC "-//OASIS//DTD DITA 1.3 Learning Object
Map//EN" "learningObjectMap.dtd">
<learningObjectMap>
  <learningObject>
    ...
  </learningObject>
</learningObjectMap>
```

A learningGroup map has this structure:

```
<!DOCTYPE learningGroupMap PUBLIC "-//OASIS//DTD DITA 1.3 Learning Group Map//
EN" "learningGroupMap.dtd">
<learningGroupMap>
  <learningGroup>
    ...
  </learningGroup>
</learningGroupMap>
```

Within a learning group element you can embed other learning groups and learning objects. This allows you to reuse topics, lessons, chapters, etc. You can also reuse other learning map types by using the `<learningObjectMapRef>` and `<learningGroupMapRef>`

Practice

1. Make a copy of the file `learningGroups-practice_start.ditamap` and open it in your editor.



Note: If you are using a DITA-aware text editor, make sure you are in text mode, rather than author or visual mode.

You should see this:

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE learningGroupMap PUBLIC "-//OASIS//DTD DITA Learning Group Map//
EN" "learningGroupMap.rng">
<learningGroupMap>

</learningGroupMap>
```

2. You should give your map a title and place the main learning group.

```
<learningGroupMap>

    <<title>Feeding Ducks</title>
    <learningGroup>
    </learningGroup>
</learningGroupMap>
```

3. Next you can reference a learning topic. For this exercise we will add learningPlan and learningOverview references. You can find the collection of files that you can use in the folder lesson5/object_samples. You can reference the Feeding Ducks learning plan (lp_feedingducks.dita) with the <learningPlanRef> element and the href attribute.

```
<learningGroupMap>
    <<title>Feeding Ducks</title>
    <learningGroup>
        <learningPlanRef
            href="lp_feedingducks.dita"/>
    </learningGroup>
</learningGroupMap>
```

Notice how the reference element states the type of topic that it references: <learningPlanRef>.

4. Then you can reference the Feeding Ducks learning overview.

```
<learningGroupMap>
    <<title>Feeding Ducks</title>
    <learningGroup>
        <learningPlanRef
            href="lp_feedingducks.dita"/>
        <learingOverviewRef
            href="lo_feedingducks.dita"/>
    </learningGroup>
</learningGroupMap>
```

5. Next you are going to add another learning group element that will contain all of the topics for the first lesson, and give it a title in the map.

```
<learningGroupMap>
    <<title>Feeding Ducks</title>
    <learningGroup>
        <learningPlanRef
            href="lp_feedingducks.dita"/>
        <learingOverviewRef
            href="lo_feedingducks.dita"/>
    </learningGroup>
    <learningGroup>
        <topicmeta>
            <navtitle>Lesson 1: Feed Quality</
navtitle>
        </topicmeta>
    </learningGroup>
</learningGroupMap>
```

6. Within this lesson you can create reusable topics. Use a learning object for this. Create a <learningObject> within the Lesson 1 learning group and name it.

```
<learningGroupMap>
    <<title>Feeding Ducks</title>
    <learningGroup>
        <learningPlanRef
            href="lp_feedingducks.dita"/>
        <learingOverviewRef
            href="lo_feedingducks.dita"/>
    </learningGroup>
    <learningGroup>
        <topicmeta>
            <navtitle>Lesson 1: Feed Quality</
navtitle>
```

```

        </topicmeta>

        <learningObject>
            <topicmeta>
                <navtitle>Topic 1</navtitle>
            </topicmeta>
        </learningObject>

    </learningGroup>

</learningGroupMap>

```

7. Now you can add all of the learning topics for the first lesson in feed quality. Include the learning plan, learning overview, all of the learning content topics, learning summary, and the learning assessment by using the appropriate reference topics.

```

<learningGroupMap>
    . . .
    <learningGroup>
        <topicmeta>
            <navtitle>Lesson 1: Feed Quality</
navtitle>

            </topicmeta>

            <learningObject>
                <topicmeta>
                    <navtitle>Topic 1</navtitle>
                </topicmeta>
                <learningPlanRef
href="lp_l1_t1_feed_quality.dita"/>
                <learningOverviewRef
href="lo_l1_t1_feed_quality.dita"/>
                <learningContentRef
href="lc_l1_t1_where_to_buy.dita"/>
                <learningContentRef
href="lc_l1_t1_storage.dita"/>
                <learningContentRef
href="lc_l1_t1_spoiling.dita"/>
                <learningContentRef
href="lc_l1_t1_ingredient_quality.dita"/>
                <learningSummaryRef
href="ls_l1_t1_summary.dita"/>
                <learningPostAssessmentRef
href="lg_l1_t1_quiz.dita" type="learningGroup"/>
            </learningObject>
        </learningGroup>
    </learningGroupMap>

```

You could add the appropriate number of learning objects and groups for the number of topics and lessons that you need to add to the map.

Assessment

Answer the following questions to check how well you understand the concepts in this lesson.

Main learningObject element

- Q 1. Learning object maps should have more than one learning object directly nested in the <learningObjectMap>.

- A. True
- B. False

LearningPlan reference

Q 1. Select the correct way to write a reference to a learning plan within a learning object in a learning object map. (pick one)

- A. `<learningObjectRef href="#.dita"/>`
- B. `<learningGroupRef href="#.dita"/>`
- C. `<learningPlanRef href="#.dita"/>`
- D. `<learningRef href="#.dita"/>`

Learning map elements

Q 1. Select all of the following that are true about learning groups and objects:

- A. You can write learning group elements within a learning object map.
- B. You can write learning group elements within a learning group map.
- C. You can write learning object elements within a learning object map.
- D. You can write learning object elements within a learning group map.
- E. You can refernece learning group elements within a learning object map.

Name learning objects

Q 1. Which element allows you to name a learning object?

- A. `<title/>`
- B. `<navtitle/>`

Learning group naming

Q 1. Which element allows you to name a learning group?

- A. `<title/>`
- B. `<navtitle/>`

Learning group map elements

Q 1. It is possible to place a `<topicref>` element within a `<learningGroup>` element.

- A. True
- B. False

LearningGroup elements

Q 1. You cannot place a `<learningContentRef>` directly within a `learningGroup`.

- A. True
- B. False