

## Module 1 – Part 2: Assessing Higher Order Thinking Skills

1	Title Slide	Welcome back to the first module in this series, Assessing Higher-Order Thinking Skills: Part 2. To advance to the next slide, select the “forward” arrow located on the play bar at the bottom of your screen.
2	Introduction	Before we begin, let’s have a quick review of what we covered in Part 1 of this module. We laid the groundwork for creating assessments by examining three perspectives of higher-order thinking, basic assessment construction, rubrics for summative evaluation, and principles for assessing higher-order thinking. In this module, we will be continuing our discussion by incorporating learning taxonomies into our assessment tasks and observing the five steps involved in analyzing the assessments we create.
3	Learning Objectives	<p>As a reminder, let’s review the learning objectives we set at the beginning of this module.</p> <p>At the completion of this module, the learner will be able to...</p> <ul style="list-style-type: none"> <li>- Define higher-order thinking</li> <li>- And design and analyze higher-order thinking assessments</li> </ul>
4	Bloom & Webb (ascd.org)	<p>Let’s begin this module by reviewing learning taxonomies that can be incorporated into our assessment tasks. The two learning taxonomies we will be discussing for the next few minutes are Bloom’s Taxonomy and Webb’s Depth of Knowledge. Both of these learning domains classify levels of thinking – low and high – that are pertinent in designing assessments and learning outcomes for students.</p> <p>Bloom’s taxonomy identifies what type of thinking is needed to complete a task – whether students need to remember, understand, apply, analyze, evaluate, or create.</p> <p>On the other hand, Webb’s Depth of Knowledge identifies how deeply students need to understand the content in order to successfully interact with it, based on complexity or abstractness. As we discussed previously, it is important to establish the level of difficulty and thinking for students to complete for an assessment. Using the learning taxonomies of Bloom and Webb can aid in establishing those levels.</p>
13	Bloom’s Taxonomy	Take just a moment to analyze the graphic on your screen. This is a visual representation of the levels of Bloom’s taxonomy. We will be going more in depth about Bloom’s Taxonomy in the upcoming module, but for now let’s observe that the lower levels of thinking are placed at the bottom of the graphic: remembering, understanding, and applying, and the higher-order thinking skills are represented in the upper region of the pyramid: creating, evaluating, analyzing. Notice the difference between the levels of thinking between remembering and creating – the lowest and highest levels of thinking in the taxonomy.
14	Assessment Blueprint with Bloom’s	<p>On this slide, we will outline a tool that you can use to specifically implement Bloom’s taxonomy into your assessments. An assessment blueprint helps in planning the balance of content and thinking in the items or tasks in your learning target or targets. Let’s take a moment to pause and look at the big picture of the assessment blueprint before we go into detail of the components shown.</p> <ul style="list-style-type: none"> <li>• The first column (content outline) lists the major topics the assessment will cover. The outline can be as simple or as detailed as you need it to be. This outline describes the content domain for your learning goals.</li> </ul>

		<ul style="list-style-type: none"> <li>• The column headings across the top list the classifications in the cognitive domain of the revised Bloom’s taxonomy, however other taxonomies may be used as well.</li> <li>• The cells in the blueprint can list the specific learning targets and the points allocated for each, or simply indicate the number of points allocated, depending on how comprehensive the content outline is.</li> <li>• The points you select for each cell should reflect your learning target and your instruction. Each time you do your own blueprint, use the intended total points of the actual assessment as the basis for figuring percents; it will not often be exactly 100 points, but we have used 100 points as an easier example.</li> <li>• Notice that the blueprint allows you to fully describe the composition and emphasis of the assessment as a whole, so you can interpret it accurately. You can also use the blueprint to identify places where you need to add material. However, it is not necessary for every cell to be filled. The important thing is that the cells that are filled reflect your learning goals.</li> <li>• A blueprint helps ensure that your assessment and the information about student achievement that comes from it have the emphasis you intend. You can plan what percentage of each topic area is allocated to what level of thinking from the points and percentages within the rows.</li> <li>• The total at the bottom tells you the distribution of kinds of thinking across the whole assessment.</li> </ul> <p>Blueprints simplify the task of writing an assessment. The blueprint tells you exactly what kind of tasks and items you need. You might, when seeing a blueprint like this, decide that you would rather remove one of the higher-order thinking objectives and use a project, paper, or other performance assessment for that portion of your learning goals for the unit, and a test to cover the rest of the learning goals.</p>
15	Webb’s DOK (ascd.org)	<p>Click on the tabs to learn more about Webb’s Depth of Knowledge.</p> <p>The first and lowest level of Webb’s Depth of Knowledge is Recall &amp; Reproduction. On this level of knowledge, students are able to recall a fact, term, principle, and concept; perform a routine procedure; and locate details.</p> <p>The second level is Basic Application of Skills or Concepts. This means that students know how to use information and conceptual knowledge, they are able to select appropriate procedures for a given task, organize or display data, interpret or use simple graphs, summarize, identify main ideas, explain relationships, and make predictions.</p> <p>The third level is strategic thinking. This level of knowledge requires reasoning, or developing a plan or sequence of steps to approach a problem. It also requires decision making or justifications. This level of knowledge allows students to think about and understand what is abstract, complex,</p>

		<p>or non-routine. At this level, students may find that there are often more than one possible answer and that they should support solutions or judgments with text evidence.</p> <p>Lastly, the fourth level is extended thinking. This depth of knowledge level means that students are able to conduct an investigation or create applications to the real-world. This level requires time to research, problem solve, and process multiple conditions of the problem or task and to synthesize information.</p> <p>You may notice that the third and fourth levels overlap some of the thoughts we discussed when we divided higher order thinking into three perspectives: transfer, critical thinking, and problem solving.</p>
16	<p>Hess' Cognitive Rigor Matrix: Applies Webb's DOK to Bloom's Cognitive Process Dimensions (source: Karin Hess, 2009 from ascd.org)</p>	<p>Let's transition now into Hess' Cognitive Rigor Matrix. This chart combines what we have just learned regarding the cognitive processes of Bloom's taxonomy to Webb's Depth of Knowledge. This matrix gives examples of potential learning tasks teachers can use when creating higher-order thinking assessments by synonymously establishing the level of thinking required – with Bloom's taxonomy, along with the depth of knowledge needed from Webb's. Certainly this same concept can be incorporated into designing an assessment blueprint, like we touched on previously.</p> <p>Observe the highlighted portions of the matrix. Note how the lowest-order thinking and lowest-depth level of the matrix combines Bloom's Remember plus Webb's Recall &amp; Reproduction, which asks students to recall or locate basic facts, details, and events.</p> <p>Now notice that the highest-order thinking and deepest level combines Bloom's Create plus Webb's Extended Thinking to have students synthesize information across multiple sources or texts. Keep this in mind as we continue through the module to create cognitively-rigorous assessments for higher-order thinking.</p>
17	<p>Types of Summative Assessment Tasks</p>	<p>Now that we have highlighted the basics of constructing assessments and incorporating principles of assessing higher-order and deeper thinking, let's briefly review the kinds of summative assessment that we can use to measure higher-order thinking skills, all of which you are familiar with in some context.</p> <p>Click on the tabs to learn more.</p> <p><b>Selection</b> items include multiple-choice, matching, and rank-order items. As you have likely experienced, selection items such as multiple choice are typically more difficult to construct, but can be valuable in assessing higher-order thinking skills such as analysis and evaluation, especially if questions are designed for the "thinking" to be encoded in the choosing. Selection tasks require more context in the form of reading selections, scenarios, tables, and charts, which provides an opportunity to incorporate introductory and novel materials. Higher-order thinking selection items also require more testing time to give students the opportunity to thoroughly engage and think complexly. It is also recommended to have the higher-order selections items you created to be reviewed by others, such as other faculty members or a small group of students.</p> <p>Selection items can also allow students to provide reasons behind their thinking by incorporating answer justification into a multiple-choice test, for example. Students would be asked to select correct responses and then provide written justifications for their choices. Even if the student</p>

		<p>answered incorrectly, he/she would still be given the opportunity to receive credit based on the adequacy of their argument.</p> <p><b>Generation</b> items such as performance tests, essays, short-answer, and portfolios, have been widely recommended for measuring higher-order thinking skills. These tasks can deal with complex, real-life problems that require students to employ several higher-order skills in their solution, especially if students are asked to support their choices or thesis, explain their reasoning, or show their work. Portfolios are also especially useful in promoting and informally assessing reflective thinking skills.</p>
18	5 Steps for Analyzing Summative Assessment (ascd.org)	After creating our assessments, we need to analyze our summative assessments to ensure that higher-order thinking is present in what we are asking our students to complete. The five steps of analyzing assessment can be summarized as... <b>Analyze, Organize, Question, Adjust, and Draw.</b>
19	5 Steps for Analyzing an Assessment (ascd.org)	First, we should <b>analyze</b> our assessment item by item by identifying and writing down what kind of learning each item assesses.
20		Second, we need to <b>organize</b> the learning targets into an assessment plan. The graphic on your screen is an example of an assessment plan. Notice how each question number is identified and summarized in terms of the learning targets the student know.
21		Third, we ought to <b>question</b> our assessment plan by asking the following questions: <ul style="list-style-type: none"> <li>• Does the number of points for each target represent its relative importance?</li> <li>• Does the number of points represent the amount of instructional time spent per target?</li> <li>• Are some important targets missing from the assessment?</li> <li>• Do all of the items align with the standards actually taught in class?</li> </ul>
22		Fourth, we should make <b>adjustments</b> to our assessment plan after we have considered the amount of time spent teaching each learning target and each target's relative importance to the content as a whole. This might mean that we need to add or delete learning targets to reflect what was taught and what was most important to learn and assess.
23		Lastly, we need to <b>draw</b> conclusions about our assessment by asking ourselves: What does your analysis tell you about the matches among what's written in your curriculum, what you taught, and what you assessed?
24	Review	<p>This concludes Part 2 of the module, Assessing Higher-Order Thinking Skills. Let's briefly review what we covered in this module. We started our discussion by incorporating Bloom's Taxonomy and Webb's Depth of Knowledge into our assessment tasks, evaluated an assessment blueprint, and uncovered the five steps for analyzing assessments to ensure that higher-order thinking skills are being measured in our students.</p> <p>In the next module, we will be discussing ways to assess specific levels of thinking – analyzing, evaluating, and creating.</p>

25	Sources	<ul style="list-style-type: none"> <li>- Brookhart, S.M. (2010) How to Assess Higher-Order Thinking Skills in Your Classroom. Alexandria, VA: ASCD.</li> <li>- Hess, K., Jones, B. S., Carlock, D., &amp; Walkup, J. R. (2009). Cognitive rigor: Blending the strengths of Bloom’s Taxonomy and Webb’s Depth of Knowledge to enhance classroom-level processes. Retrieved from: <a href="https://eric.ed.gov/?id=ED517804">https://eric.ed.gov/?id=ED517804</a></li> <li>- King, F. J., Goodson, L., &amp; Rohani, F. (2011). Higher order thinking skills: Definition, teaching strategies, &amp; assessment. Center for Advancement of Learning and Assessment. Retrieved from <a href="http://www.cala.fsu.edu/files/higher_order_thinking_skills.pdf">http://www.cala.fsu.edu/files/higher_order_thinking_skills.pdf</a></li> <li>- Bell, E., Allen, R., &amp; Brennan, P. (2001). Assessment of higher order thinking skills: A discussion of the data from the 2001 random sampling exercise and a workshop for teachers. Queensland Board of Senior Secondary School Studies. Retrieved from <a href="https://www.qcaa.qld.edu.au/downloads/publications/research_qbssss_assess_hots_01.pdf">https://www.qcaa.qld.edu.au/downloads/publications/research_qbssss_assess_hots_01.pdf</a></li> <li>- Paul, R. &amp; Nosich, G. (2017). A model for the national assessment of higher order thinking. The Foundation for Critical Thinking. Retrieved from <a href="http://www.criticalthinking.org/pages/a-model-for-the-national-assessment-of-higher-order-thinking/591">http://www.criticalthinking.org/pages/a-model-for-the-national-assessment-of-higher-order-thinking/591</a></li> <li>- Bless, M. (2014). Assessing higher order thinking: tools for analyzing student performance tasks. ReVision Learning Partnership. Retrieved from <a href="http://www.ascd.org/ASCD/pdf/siteASCD/policy/2014/Bless-Assessing-Higher-Order-Thinking.pdf">http://www.ascd.org/ASCD/pdf/siteASCD/policy/2014/Bless-Assessing-Higher-Order-Thinking.pdf</a></li> <li>- DePaul University Teaching Commons (2018). Types of Rubrics. Retrieved from <a href="https://resources.depaul.edu/teaching-commons/teaching-guides/feedback-grading/rubrics/Pages/types-of-rubrics.aspx">https://resources.depaul.edu/teaching-commons/teaching-guides/feedback-grading/rubrics/Pages/types-of-rubrics.aspx</a></li> </ul>
26	Credits	Thank you for viewing this module.