

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

1	Title Slide	Welcome to the first module in this series, Assessing Higher Order Thinking Skills: Part 1. To advance to the next slide, select the “forward” arrow located on the play bar at the bottom of your screen.
2	Quote	<p>Before we begin, let's ponder this quote:</p> <p>“Epistemologists still debate the definition of knowledge. A classic definition... is that for something to count as knowledge, it must be justified, true, and believed. Even seemingly simple knowledge rests on some historical higher order thinking. Facts and concepts did not fall out of the sky – or out of a textbook. They were discovered and debated until they came to be widely true, and widely believed. When we teach students to do higher order thinking, we are not just teaching them some fancy skills useful for the flexibility and adaptability required for life in our 21<sup>st</sup> century ‘information age.’ We are teaching them to be human” (Brookhart, 2010).</p>
3	Introduction	The focus of this module is on the assessment of higher-order thinking. We will be describing ways to design assessments that require students to do higher-order thinking in a way that the thinking becomes visible for appraisal, feedback, and discussion with the student. This module was developed using the book “How to Assess Higher-Order Thinking Skills in Your Classroom” – by Brookhart and other resources from ASCD.org.
4	Learning Objectives	<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>- Design and analyze higher-order thinking assessments</li> </ul>
5	Defining HOTS	<p>Higher order thinking “requires construction of knowledge through the use of disciplined inquiry, to produce discourse, products, or performances that have value beyond school.” For the purpose of this module, higher-order thinking will be examined in light of three perspectives identified by Brookhart: transfer, critical thinking, and problem solving. Click the tabs to learn more.</p> <p>Higher-order thinking as <b>transfer</b> gives students the ability to “relate their learning to other elements beyond those they were taught to associate with it” into more complex ways in new or different settings.</p> <p>Higher-order thinking as <b>critical thinking</b> means students can “apply wise judgment or produce a reasoned critique” to reflect, reason, and make sound decisions.</p> <p>Higher-order thinking as <b>problem solving</b> is the “non-automatic strategizing required for reaching a goal that cannot be met with a memorized solution.”</p>
6	Basic Principles for Assessment Construction (ascd.org)	<p>Before we discuss how to assess higher-order thinking skills, we need to review the basic principles for constructing assessments. Click the tabs to learn more about the foundations of creating assessments.</p> <p><b>Specify clearly the kind of thinking and the content knowledge you wish to see evidence for from your students.</b></p> <p>Check each learning goal you intend to assess to make sure that it clearly specifies the relevant content and what type of performance or task the student will be able to do with this content. If these are not explicitly clear, you have some clarifying to do.</p>

		<p>For example, ponder the difference between the following learning goals: “the student understands what slope is” versus “the student can solve multistep problems that involve identifying and calculating slope.”</p> <p>The difference is the second goal statement specifies what the students are able to do. It also describes the intended learning target and how students will still need to understand what slope is to be able to aim their thinking and work toward the target.</p> <p>-</p> <p><b>Design performance tasks or test items that require students to use the targeted thinking and content knowledge.</b> In other words, does the assessment really ask students to demonstrate the desired knowledge and thinking skills?</p> <p>Individual assessment items and tasks should make use of intended learning goals and should collectively represent the whole domain of desired knowledge and thinking skills in a relevant way.</p> <p>For example, a professor’s unit on learning theories stated the goal that students would be able to summarize the foundational learning theories. The professor’s assessment consisted of a section of questions matching theories with theorists and a section requiring identification of major studies. Higher-order thinking was required for this assessment, however, none of these items or tasks directly tapped the students’ ability to summarize learning theories.</p> <p>-</p> <p>The last basic principle for assessment construction is to <b>decide what you will take as evidence to demonstrate that the student has exhibited the kind of thinking you intended.</b> After students have completed the assessments – then what? You need a plan for interpreting their work as evidence of the specific learning you intended.</p> <p>If your assessment is formative – which means it checks the student’s understanding of learning for the purpose of providing feedback - then you need to know how to interpret student responses and structure feedback. The criteria you use as the basis for giving students feedback should reflect the clear learning target and vision of exemplary work you shared with the students.</p> <p>If your assessment is summative, or for the purpose of evaluating learning and grading, then you need to design a system to score student responses in such a way that the scores reflect degrees of achievement.</p> <p>A rubric is a tool that can be used to provide formative feedback and summative evaluation in regard to higher-order thinking skills.</p>
7	Types of Rubrics	<p>Once you have clearly specified your intended learning goals and have designed tasks that allow students to demonstrate their knowledge and/or skill, then you will need to select or write a rubric that reflects your intentions for teaching, learning, and assessing. The rubrics should be balanced in a way that demonstrates the emphasis you place on each criterion.</p> <p>For example, a common rubric format for written projects assesses “content completeness and</p>

		<p>accuracy, organization and communication, and writing and grammar." If each criterion is weighted equally, only one-third of the project's score reflects content.</p> <p>Acknowledging this may lead you to put more emphasis on assessing the content, or you may decide that your rubric assesses facts instead of interpretation, to which you may change the criteria to "content completeness and accuracy, <b>soundness of thesis and reasoning</b>, and writing and grammar."</p> <p>It is also important to select or write rubrics that describe qualities rather than count things, such as "reasoning is logical and thoughtful" versus "includes at least three reasons."</p> <p>The two types of rubrics we will discuss in this module are holistic and analytical. Examples of these will be shown throughout the module series.</p>
8	Types of Rubrics	Holistic rubrics describe student's work by applying all criteria at the same time to assess the entire process. A holistic rubric typically consists of a single scale that contains all the criteria to be assessed to be considered as a "whole." Note the example in the module.
9	Types of Rubrics	Analytical rubrics are often used for scoring items or tasks such as performance assessments, papers, and projects. These rubrics describe the work of each criteria separately and focus on individual details of the final product. Take just a moment to review the rubric example here.
10	Ask Yourself...	<p>When deciding what thinking skills are required for an assessment task, ask yourself, "<u>How</u> would I (the student) have to think to answer this question or do this task?"</p> <p>Likewise when deciding content knowledge, ask yourself, "<u>What</u> would I (the student) have to think about to answer the question or do the task?"</p> <p>Let's keep this mentality in mind as we begin designing our assessments specifically for higher-order thinking.</p>
11	Principles for Assessing HOTS (ascd.org)	<p>The following principles for assessing higher-order thinking can be implemented in addition to what we already know about basic assessment construction. Click the tabs to learn more.</p> <p>One way to set your classroom up for assessing higher-order thinking skills is to present new materials for students to think about. This could mean that you incorporate <b>introductory material</b> in your assessments, such as introductory text, visuals, scenarios, resource material, or problems.</p> <p>In that same vein, implement <b>novel material</b>, which is material that has not been previously covered in class. Teachers should avoid short-circuiting assessments that are meant to evaluate higher-order thinking by using the same questions or ideas in class that they know will be on the test, essentially "teaching to the test." However, when presenting new material to be used in the classroom, students should be assessed on things they were taught to do, not surprised with a performance assessment that includes tasks for which they have had no practice. Dealing with novel ideas, solving problems, and thinking critically should not be something students feel they "have never done before." Instead, presenting students with introductory, novel material gives them the opportunity to analyze and reason without relying on previous class discussions or memorization of the material.</p>

		<p>The emphasis here should be on the process of thinking they have used in previous discussions or materials they have observed, not the actual discussions or recall of information from those materials.</p> <p><b>Distinguish between level of difficulty and thinking.</b> Level of difficulty encompasses the difference between “easy versus hard” and level of thinking is the difference between “high versus low”, such as recalling facts and using higher-order thinking. There is a common misconception that recall is “easy” and higher-order thinking is “hard.” This can lead to poor results, as there can be both easy and difficult recall AND higher-order thinking questions and they are ALL necessary.</p>
12	Easy vs. Difficult	<p>Click on the tabs to uncover examples of levels of difficulty and thinking:</p> <p>An easy recall statement may be “Meat from cattle that are aged less than one year old is called _____. ”</p> <p>A difficult recall statement could be “Name all nine steps of the cattle slaughtering process.”</p> <p>On the other hand, an easy higher-order thinking question could be, “Why do you think states such as Texas, Kansas, Nebraska, and Oklahoma are significant producers of beef cattle?”</p> <p>A difficult question could be, “From the extension packet, <i>Understanding Yield Grades and Quality Grades for Value-Added Beef Producers and Marketers</i>, distinguish the difference between yield grades and quality grades with evidence from the article to support your explanation. What role do you think yield and quality grades play in the lives of consumers, beef producers, and marketers? Explain your reasoning.”</p>
13	Review	<p>This concludes Part 1 of the first module in the series, Assessing Higher-Order Thinking Skills. As we come to a close, let’s consider all that we have covered so far. We started the module by examining higher order thinking as three perspectives: transfer, critical thinking, and problem solving. Then we discussed basic principles for constructing all assessments, reviewed holistic and analytical rubrics, and explored principles for assessing higher order thinking.</p> <p>In this module, we laid the groundwork for creating assessments that measure higher-order thinking. In the next module, we will be continuing this discussion by incorporating learning taxonomies into our assessment tasks and observing the five steps involved in analyzing the assessments we create.</p>

14	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>- <a href="http://www.cala.fsu.edu/files/higher_order_thinking_skills.pdf">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 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>
15	Credits	Thank you for viewing this module.