Aligning Instruction and Assessment
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Welcome and Introductions

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Today’s Learning Targets

• Develop a trained eye to critically review existing assessments and design new assessments with regard to:

  – Strengthening alignment
  – Increasing cognitive rigor
Is Classroom Assessment Important?

What if we just don’t do it?

Drivers earn a license through assessment... important?
Pilots earn their wings through assessment... important?
Doctors earn their practice through assessment... important?
Is evidence of learning important to you as a teacher?

Assessment is evidence collection
Without it, everyone is just staying at Holiday Inn Express!
Consider This

“Research shows that teachers spend from a quarter to a third of their professional time on assessment-related activities. Almost all do so without the benefit of having learned the principles of sound assessment.”

High-Quality Assessment
Begin With a Purpose

Let PURPOSE (not convenience) drive:

- number of items
- type of items
- testing conditions
- test format
- collaboration
- vetting
Know Your Priorities

The knowledge and skills are important today, tomorrow, and in the future.
Example: Reading comprehension

The knowledge and skills are used in more than one content area at a specific grade level.
Example: Creating and analyzing charts and graphs

The knowledge and skills are key to success in subsequent grade levels or courses.
Example: Understanding of fractions to prepare for work with rational numbers
Know Your Priorities

- Introduced early
- Reinforced often
- Multiple opportunities for learning
It’s All About Alignment

Are the expectations and cognitive demands consistent for the learning priorities, the instruction, and the assessment?
It’s All About Alignment

What do I want my students to know and be able to do?
Alignment at the Item Level

True ✅ False
Is This Item Aligned?

K.G2: Correctly name shapes regardless of their orientations or overall size. (CCSS)

• Show me the triangles.
• Show me the pentagons.
• Show me the cylinders.
MD.1.2: Express the length of an object as a whole number of length units by laying multiple copies of a shorter object end to end.

Pete used leaves to measure the length of one window.

How many leaves long are two windows? ______ leaves long
LS 5.2: Food webs can be used to identify the relationships among producers, consumers and decomposers in an ecosystem. (ONLS)

3. Which of the choices below describes the roles of the four organisms in the correct order from left to right?
   A. consumer, consumer, decomposer, producer
   B. decomposer, consumer, consumer, producer
   C. producer, consumer, consumer, decomposer
RL 7.4. Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama.

What meaning does Emanuel di Pasquale intend through his use of metaphor and personification, “The moon, only half a person, has fallen down on his back,” in lines 5-6 of his poem? He uses the metaphor and personification to:

A. emphasize the fact that the speaker is not alone.

B. describe the appearance of the moon.

C. compare the speaker’s size to the moon.

D. accentuate the darkness of the setting.

Recognize and generate simple equivalent fractions; explain why the fractions are equivalent by using a visual fraction model.

Drag the sliders below to create fraction strips for the two equivalent fractions shown. First divide the strips into sections, and then shade in some of the sections.

\[ \frac{1}{2} = \frac{3}{6} \]
Create a mixed media landscape that conveys a story and depicts a well-known character from children's fiction. Be prepared to discuss your artistic/stylistic choices as well as the cultural and/or social symbolism of the piece.

PE 6.4: Connect selected ideas, concepts and processes used in visual art with those used in other academic disciplines.
PR 6.2: Experiment with a variety of techniques and working methods when creating an original work of art.
RE 6.3: Explore and discuss how aspects of culture influence ritual and social artwork.
Analyze the causes and consequences of major political, economic and social developments of the 1930’s with emphasis on the Dust Bowl. (OACS)

Which of the following areas was most associated with “the Dust Bowls” of the 1930s?

a. Area marked A  
b. Area marked B  
c. Area marked C  
d. Areas marked by D and E
Alignment at the Assessment Level
Aligned?

Inadequate Content-Related Validity

Aligned?

Partial Content-Related Validity

Alined?

Missing Content-Related Validity

Aligned!

Excellent Content-Related Validity

Alignment at Assessment Level

- Eliminate assessment items that contain content unrelated to what is intended to be measured.

- Ensure a representative distribution of assessment items.

- Ensure item alignment to both the content and the skill levels, and address the rigor of the standard.

- Ensure that demonstration of mastery of content and skills being measured is not affected by content and skills not being measured.
What About Cognitive Rigor?
What is Cognitive Rigor?

Rigor is creating an environment in which each student is expected to learn at high levels, each student is supported so that he or she can learn at high levels, and each student demonstrates learning at high levels.

Barbara Blackburn, 2008
What About Cognitive Rigor?

Students learn skills and acquire knowledge more readily when they can transfer their learning to new or more complex situations, a process more likely to occur once they have developed a deep understanding of content (National Research Council, 2001).

Therefore, ensuring that a curriculum aligns to standards *alone* will not prepare students for the challenges of the twenty-first century.

Increasing the complexity of thinking in course content, instruction and assessment

**Course content**
- Content acquisition ([Learning Progressions](#))
- Appropriate leveled text for challenge

**Instruction**
- Activities promoting critical thinking
- Communication building relevance
- Applying integrated ideas
- Application of concepts
- Promote responsibility

**Assessment**
- Aligned to instructional targets
- Engages with academic content
- Requires extended, elaborated responses

Source: Adapted from *Defining Rigor*, Julie Edmunds, by Center for College and Career Readiness
What About Cognitive Rigor?

Teachers must therefore provide all students with challenging tasks and demanding goals, structure learning so that students can reach high goals, and enhance both surface and deep learning of content (Hattie, 2002).


http://www.eric.ed.gov/PDFS/ED517804.p
Cognitive Demands

• In Ohio’s 2002 Standards, teachers were encouraged to pay attention to *verbs* to identify the level of cognitive complexity.

  4th Grade:  **Identify** examples of cause and effect

  6th Grade:  **Analyze** examples of cause and effect
Bloom’s Taxonomy served that purpose quite well. We aligned verbs because our standards were designed around them...
Cognitive Demands

HOWEVER...
Many of Ohio’s new learning standards require teachers to look beyond the verb to determine the level of cognitive complexity.

• 1st Grade: **Describe** characters, settings, and major events in a story using key details.

• 2\textsuperscript{nd} Grade: **Describe** how characters in a story respond to major events and challenges.

• 3\textsuperscript{rd} Grade: **Describe** characters in a story (e.g., their traits, motivations, or feelings), and explain how their actions contribute to the sequence of events.
Webb’s Depth of Knowledge

Based on the research of Norman Webb.

Mechanism to ensure that the intent of the standard and the level of student demonstration required by that standard matches the assessment items.

Defines the “ceiling” or highest DOK level for each Core Content standard for the state assessment

Guides item development for state assessments
Webb’s Depth of Knowledge

Level 1: Recall / Reproduction
Recall or recognition of a fact, information, concept or procedure

Level 2: Skill / Concept
Use of information, conceptual knowledge, follow or select appropriate procedures, two or more steps with decision points along the way, routine problems, organize/display data

Level 3: Strategic Thinking
Requires reasoning, developing a plan or sequence of steps to approach a problem; requires some decision making and justification; abstract and complex; often more than one possible answer

Level 4: Extended Thinking
An investigation or application to real world; requires time to research, think and process multiple conditions of problem or task; non-routine; across multiple disciplines; multiple sources
### Hess’ Cognitive Rigor Matrix

#### Table 2: Hess’ Cognitive Rigor Matrix with Curricular Examples: Applying Webb’s Depth-of-Knowledge Levels to Bloom’s Cognitive Process Dimensions

<table>
<thead>
<tr>
<th>Bloom’s Revised Taxonomy of Cognitive Process Dimensions</th>
<th>Webb’s Depth-of-Knowledge (DOK) Levels</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remember: Retrieve knowledge from long-term memory; recognize, recall, locate, identify</td>
<td>Recall, recognize, or locate basic facts, ideas, principles</td>
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<tr>
<td>Understand: Construct meaning, clarity, paraphrase, restate, translate, illustrate, give examples, classify, categorize, summarize, generalize; infer a logical conclusion (such as from examples given), predict, compare/contrast, match like ideas, construct models</td>
<td>Compose &amp; decompose numbers; Evaluate an expression; Locate points (grid, number line); Represent math relationships in words, pictures, or symbols; Write simple sentences; Select appropriate word for intended meaning; Describe/explain how or why</td>
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<tr>
<td>Apply: Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an unfamiliar task</td>
<td>Follow simple/routine procedure (recipe-type directions); Solve a one-step problem; Calculate, measure, apply a rule; Apply an algorithm or formula (area, perimeter, etc.); Represent in words or diagrams a concept or relationship; Apply rules or use resources to edit spelling, grammar, punctuation, conventions</td>
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<tr>
<td>Analyze: Break into constituent parts, determine how parts relate, differentiate between relevant-relevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias or point of view)</td>
<td>Retrieve information from a table or graph to answer a question; Identify or locate specific information contained in maps, charts, tables, graphs, or diagrams; Categorize, classify materials; Compare/contrast figures or data; Select appropriate display data; Organize or interpret (simple) data; Extend a pattern; Identify use of literary devices; Identify text structure of paragraph; Distinguish relevant-relevant from irrelevant-relevant; Exposition</td>
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<tr>
<td>Evaluate: Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique</td>
<td>Compare information within or across data sets or texts; Analyze and draw conclusions from more complex data; Generalize a pattern; Organize/interpret data; complex graph; Analyze author’s craft, viewpoint, or potential bias</td>
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<tr>
<td>Create: Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, construct, produce</td>
<td>Brainstorm ideas, concepts, or perspectives related to a topic or concept; Generate conjectures or hypotheses based on observations or prior knowledge; Synthesize information within one source or text; Formulate an original problem, given a situation; Develop a complex model for a given situation</td>
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<tr>
<td></td>
<td>Explain, generalize, or connect ideas using supporting evidence; Explain thinking when more than one response is possible; Explain phenomena in terms of concepts; Write full composition to meet specific purpose; Identify themes</td>
<td>Use concepts to solve non-routine problems; Design investigation for a specific purpose or research question; Conduct a designed investigation; Apply concepts to solve non-routine problems; Use reasoning, planning, and evidence; Revise final draft for meaning or progression of ideas</td>
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<tr>
<td></td>
<td>Explain how concepts or ideas specifically relate to other content domains or concepts; Develop generalizations of the results obtained or strategies used and apply them to new problem situations</td>
<td>Select or devise an approach among many alternatives to solve a novel problem; Conduct a project that specifies a problem, identifies solution paths, solves the problem, and reports results; Illustrate how multiple themes (historical, geographic, social) may be interrelated</td>
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</tbody>
</table>

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Webb’s Depth of Knowledge

Level I and Level II – Usually one right answer

Level III – More than one correct answer or approach is possible

Level IV – Real-world applications in new situations
DOK: Things to Remember

✓ DOK is **NOT** the same as difficulty. Even level 1 can be very difficult (Who Wants to be a Millionaire).

✓ DOK is **MORE** than the verb. What comes after the verb is more important than the verb itself.

✓ DOK levels can be cumulative: a DOK 3 assessment task may contain a combination DOK 1 and DOK 2 level demands.

✓ DOK 1 + DOK 1 ≠ DOK 2

✓ A strong majority of PARRC assessment items will be at DOK levels 2 and 3
CCSS.ELA-Literacy.L.7.2a Use a comma to separate coordinate adjectives (e.g., *It was a fascinating, enjoyable movie* but not *He wore an old[,] green shirt*).

CCSS.ELA-Literacy.RI.11-12.2 Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.

CCSS.ELA-Literacy.RL.11-12.7 Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.)
Which DOK Level?

**CCSS.Math.Content.K.CC.A.3** Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

**CCSS.Math.Content.3.NF.A.3b** Recognize and generate simple equivalent fractions, e.g., \(1/2 = 2/4, 4/6 = 2/3\). Explain why the fractions are equivalent, e.g., by using a visual fraction model.

**CCSS.Math.Content.8.G.C.9** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
Which DOK Level?

Gr. 5: Plan and implement a scientific experiment that determines how the mass* of an object (or amount of force acting on an object) affects how the motion of an object changes. Analyze the data to determine trends. Formulate a conclusion.

GR. 7: Make a series of bar graphs that show kinetic energy, potential energy and thermal energy for eight different positions on the roller coaster.

Art HS 3RE Use appropriate vocabulary to define and describe techniques and materials used to create works of art.

PE Gr. 3: Throw overhand with force using appropriate critical elements (e.g., side to target, step with opposite foot, rotate trunk, bend elbow, extend and follow through).
Little Red Riding Hood
**Little Red Riding Hood & Cognitive Rigor**

- Do your questions assess only basic comprehension?
- Can you pose questions that require a range of depth of knowledge?

<table>
<thead>
<tr>
<th>Revised Bloom’s Taxonomy</th>
<th>Webb’s DOK Level 1: Recall &amp; Reproduction</th>
<th>Webb’s DOK Level 2: Skills &amp; Concepts</th>
<th>Webb’s DOK Level 3: Strategic Thinking/Reasoning</th>
<th>Webb’s DOK Level 4: Extended Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Remember</strong></td>
<td>What color was Red’s cape? Where was Little Red Riding Hood going? What did the wolf do to trick Little Red Riding Hood? How did the story end?</td>
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</tr>
<tr>
<td><strong>Understand</strong></td>
<td>Who was the main character? What was the story’s setting? Retell or summarize the story in your own words.</td>
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</tr>
<tr>
<td><strong>Apply</strong></td>
<td>Identify transitional words and phrases that helped you to know the sequence of events in the story.</td>
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</tr>
<tr>
<td><strong>Analyze</strong></td>
<td>What are some examples of personification used in the story? What is the same and different about your grandmother’s house and the house in the story?</td>
<td>Are all wolves (in literature) like the wolf in this story? Support your response using evidence from other texts.</td>
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<td></td>
</tr>
<tr>
<td><strong>Evaluate</strong></td>
<td></td>
<td></td>
<td>What is your opinion about the intelligence of the wolf? Justify using details/evidence from the story.</td>
<td></td>
</tr>
<tr>
<td><strong>Create</strong></td>
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<td></td>
<td></td>
<td>Write a telephone conversation between Little Red Riding Hood and her mother that explains the wolf incident.</td>
</tr>
</tbody>
</table>
Depth of Knowledge

- Level 1: recall
- Level 2: skill/concept
- Level 3: strategic
- Level 4: extended
Now What?

✓ Focus your own learning / practice. Use tools.
✓ Work collaboratively (horizontally and vertically). Be a critical friend.
✓ Design sequentially, with the end in mind.
✓ Before starting over, revise what you have.
✓ Remember the three-sided triangle
✓ CALL when you want help.

Assessment Literacy Ohio