DIGGING DEEPER INTO DEPTH OF KNOWLEDGE

RIGOR AND RELEVANCE IN THE COMMON CORE ERA

WEBINAR OUTCOMES

- Understand the Depth of Knowledge model
- Recognize the impact of Common Core and Smarter Balance on rigor and relevancy within the classroom setting
- Identify implications on classroom instructional practices
- Identify implications on classroom assessment practices

WEBINAR OUTLINE

- Set the foundation
- Explore the Depth Of Knowledge Model
- Make Connections
  - Common Core
  - Smarter Balanced
- Identify Implications
  - Classroom Instruction
  - Classroom Assessment

SETTING THE FOUNDATION

- Curriculum Standards are written for many reasons two of which are…
  - To give teachers the an idea of what students need to know and be able to do with pertinent information within a content area…and
  - To give test developers the information necessary to create an aligned assessment to determine if students have learned and can apply that information.

SETTING THE FOUNDATION

- Every Curriculum Standard includes **verbs**…These verbs have a twofold purpose…
- They define the depth of knowledge and cognitive complexity expected for classroom instruction **(Depth of Knowledge) and…**
- They represent how students will be expected to demonstrate their knowledge, concepts and skills on the state assessment (Target-Method Match)

DEPTH OF KNOWLEDGE (DOK) IS…

SETTING THE FOUNDATION

- Required by Federal Mandates…
- No Child Left Behind (NCLB) and subsequent waivers require state assessments to "measure the depth and breadth of the state academic content standards for a given grade level" (*U.S. Department of Education, 2003, p. 12*)

SETTING THE FOUNDATION

- Depth of Knowledge (DOK)…
  - Indicates the cognitive demand limits for the state assessment
  - Defines the "ceiling" or highest DOK level for each standard for the state assessment
  - Guides item development for the state assessment, classification of test items, and alignment to the state standards.

SETTING THE FOUNDATION

- Depth of Knowledge (DOK)…

- Ensures alignment of content standards and state assessment items
- Ensures that an assessment item is as cognitively demanding as the expectation of the content standard
- Provides a consistent framework across content areas for alignment

SETTING THE FOUNDATION

- Where Did DOK Come From?
- Developed by Dr. Norman Webb, of the Wisconsin Center for Educational Research.
- Developed in 1997

SETTING THE FOUNDATION

- DOK Compared to Bloom's Taxonomy
- DOK is similar to Bloom's Taxonomy in that they both relate to complexity of thought.
- However, they differ in both scope and application.

SETTING THE FOUNDATION

- DOK Compared to Bloom's Taxonomy

- Bloom's Taxonomy categorizes the cognitive skills required of the brain when faced with a new task, therefore describing the type of thinking processes necessary to answer a question.

SETTING THE FOUNDATION

- DOK Compared to Bloom's Taxonomy

- …while the DOK model relates more closely to the depth of content understanding and scope of a learning activity, which manifests in the skills required to complete the task from beginning to end.

Cognitive rigor (CR) matrix with curricular examples.

Revised Bloom's Taxonomy levels	Webb's Depth-of-Knowledge Levels Level 1 Recall and Reproduction	Level 2 Skills and Concepts	Level 3 Strategic Thinking/ Reasoning	Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	Recall, recognize, locate basic facts, ideas, principles Recall or identify conversions: between units of measure Identify facts/details in texts			
Understand Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, compare/contrast, match like ideas, explain, construct models	Compose/decompose numbers Evaluate an expression Locate points on a grid Symbolize math relationships Write simple sentences Describe/explain how or why	Specify and explain relationships Give non-examples/examples Make and record observations Summarize results, concepts, ideas Infer or predict from data or texts Identify main ideas	Explain, generalize, or connect ideas using supporting evidence Explain phenomena in terms of concepts Write full composition to meet specific purpose Identify themes	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
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	Follow simple/routine procedures Solve a one-step problem Calculate, measure, apply a rule Apply an algorithm or formula Represent in words or diagrams a concept or relationship Apply rules or use resources to edit spelling and grammar	Select a procedure according to task needed and perform it Solve routine problem applying multiple concepts or decision points Retrieve information from a graph and use it solve a multi-step problem Use models to represent concepts Write paragraph using appropriate organization, text structure	Use concepts to solve non-routine problems Design investigation for a specific purpose or research question Conduct a designed investigation Use reasoning, planning, and evidence Revise final draft for meaning or progression of ideas	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
Analyze Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias or point of view)	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 Extend a pattern Identify use of literary devices Identify text structure of paragraph	Compare information within or across data sets or texts Analyze and draw conclusions Generalize a pattern Organize/interpret data Analyze author's craft or viewpoint	Analyze multiple sources of evidence or multiple works by the same author, or across genres Analyze complex/abstract themes Gather, analyze, and organize information Analyze discourse styles
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique			Cite evidence and develop a logical argument for concepts Describe, compare, and contrast solution methods Verify reasonableness of results Justify conclusions made	Gather, analyze, and evaluate relevancy and accuracy Draw and justify conclusions Apply understanding in a novel way, provide argument or justification for the application
Create Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, construct, produce	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 Develop a complex model for a given situation	Synthesize information across multiple sources or texts Design a model to inform and solve a real-world, complex, or abstract situations

THE DEPTH OF KNOWLEDGE MODEL

THE DOK MODEL

- Assigning depth-of-knowledge to content standards and assessment items is an essential requirement of alignment analysis
- There are **four** levels of depth of knowledge:

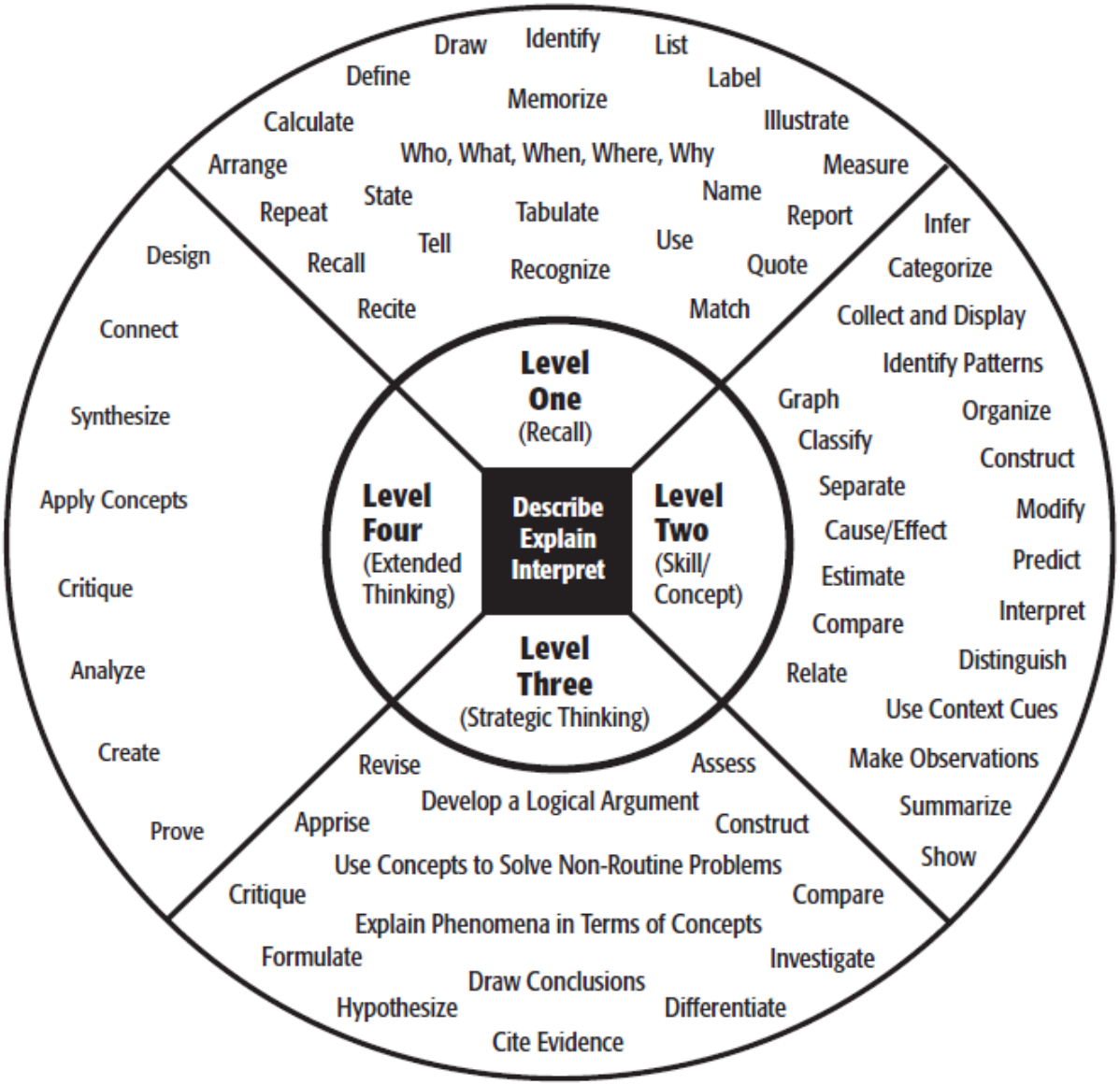
Recall and Reproduction – Level 1

Skills & Concepts – Level 2

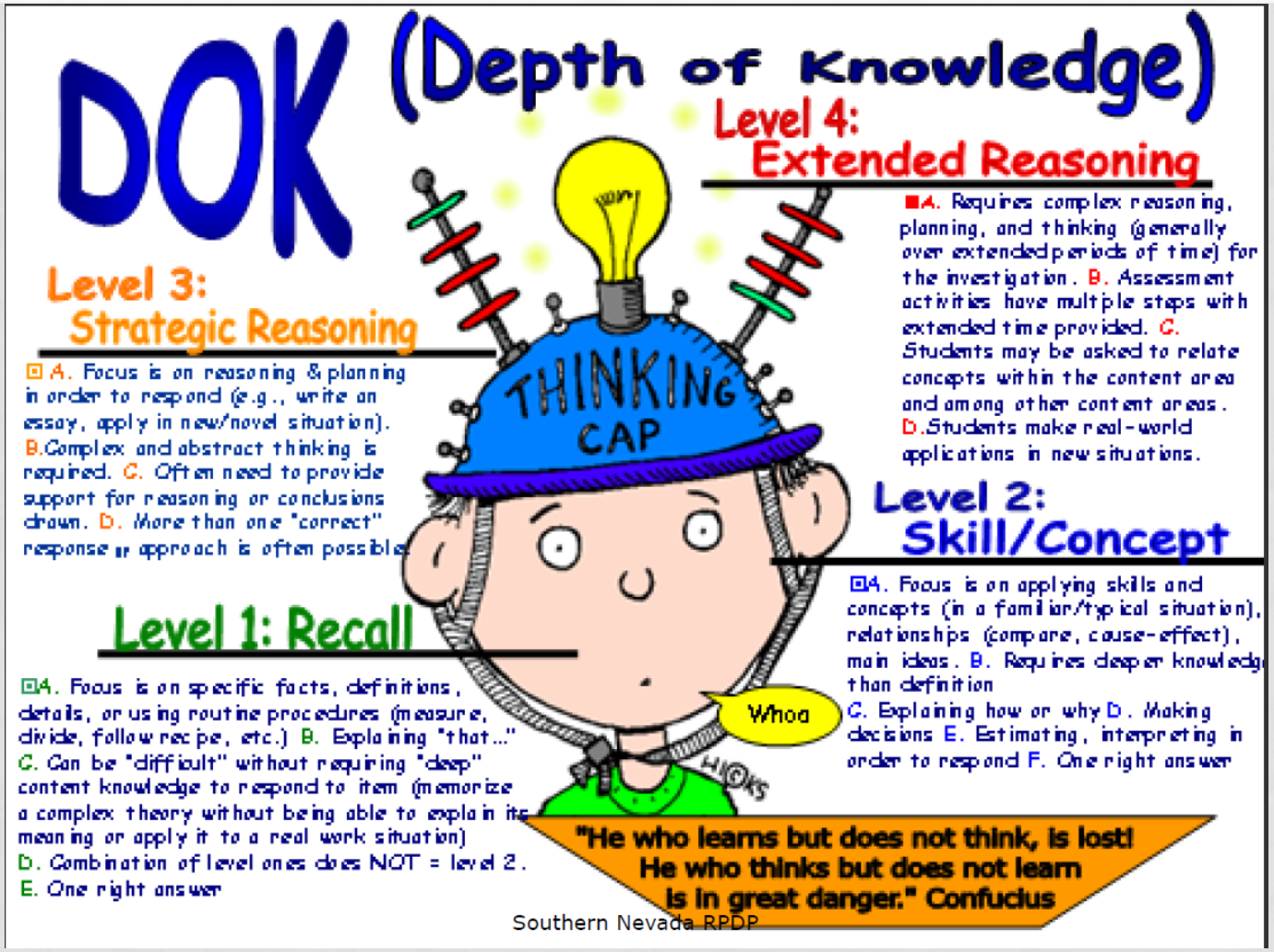
Strategic thinking- Level 3

Extended thinking – Level 4

Depth of Knowledge (DOK) Levels



THE DOK MODEL



RECALL AND REPRODUCTION: LEVEL 1

- DOK 1 requires recall of information, such as a fact, trend, definition, term, or performance of a simple process or procedure. It could also ask students to recognize or identify specific information from a given prompt
- Answering a Level 1 item can involve following a simple, well-known procedure or formula. DOK 1 is characterized by recall of simple skills and abilities and to recall who, what, where and when type information.

LEVEL 1: EXAMPLES

- List animals that survive by eating other animals.
- Locate or recall facts explicitly found in text
- Describe physical features of places
- Determine the perimeter or area of rectangles given a drawing or labels
- Identify elements of music using musical terminology
- Identify basic rules for participating in simple games and activities

SKILLS/CONCEPTS: LEVEL 2

- DOK 2 includes the engagement of some mental processing beyond recalling or reproducing a response. Items make ask students to compare/contrast, convert information from one form to another and require students to make some decisions as to how to approach the question or problem.
- These actions imply more than one mental or cognitive process/step as students have to describe or explain a result or “how” and “why.”

LEVEL 2: EXAMPLES

- Compare desert and tropical environments
- Identify and summarize the major events, problem, solution, conflicts in literary text
- Explain the cause-effect of social events
- Predict a logical outcome based on information from text
- Explain and give examples of how good work habits are important at home, school, and on the job.
- Classify plane and three dimensional figures
- Describe various styles of music

STRATEGIC THINKING: LEVEL 3

- DOK 3 requires deep understanding as exhibited through planning, using evidence, and more demanding cognitive reasoning. The cognitive demands at Level 3 are complex and abstract. It goes beyond explaining the "why" and "how" to justifying them through application and artifacts.
- A higher order assessment item that has more than one possible answer and requires students to justify the response they give would typically be a Level 3.

LEVEL 3: EXAMPLES

- Propose and evaluate possible solutions to a social problem.
- Develop and justify a scientific model for a complex issue
- Solve a multiple-step problem and provide support with a mathematical explanation that justifies the answer
- Explain, generalize or connect ideas, using supporting evidence from a text or source
- Create a dance that represents the characteristics of a culture

EXTENDED THINKING: LEVEL 4

- DOK 4 requires high cognitive demand and the work is very complex. Students are expected to connect and —relate ideas *within* the content or *among* content areas. This level often requires a task or product that provides evidence that the cognitive demand has been met by the students.
- Due to the complexity of cognitive demand, DOK 4 often requires an extended period of time.

LEVEL 4: EXAMPLES

- Gather, analyze, organize, and interpret information from multiple (print and non print sources)to share with others
- Analyzing author's craft (e.g., style, bias, literary techniques, point of view)
- Describe and illustrate how common themes can be interpreted from many texts across many cultures

LEVEL 4: EXAMPLES

- Create and participate in a mock trial
- Specify a problem within their community and develop a reasonable solution and make the results public.
- Write and produce an original song

THE DOK MODEL

- **Consider this…**
  - The Depth of Knowledge is **NOT** only determined by the verb used within the standard. One needs to consider the context in which the verb is used: the cognitive demand or rigor of thought, the depth of content knowledge and the application of content that students must use to compete a given task.

THE DOK MODEL

Same verb—three DOK levels

- **DOK 3- *Describe*** a model that you might use to represent the relationships that exist within the rock cycle. (requires deep understanding of rock cycle and a determination of how best to represent it)
- **DOK 2- *Describe*** the difference between metamorphic and igneous rocks. (requires cognitive processing to determine the differences in the two rock types)
- **DOK 1- *Describe*** three characteristics of metamorphic rocks. (simple recall)

REMEMBER…

- Depth of Knowledge (DOK) is a scale of cognitive demand.
- DOK Levels 2, 3, and 4 are often built on DOK Level 1
- DOK addresses the content being assessed and the depth to which we expect students to demonstrate understanding of that content.

REMEMBER…

- The context of the assessment item/standard must be considered to determine the DOK-not just a look at what verb was chosen.

- If there is uncertainty about which level the standard address, it is appropriate to select the high of the two levels.

- It is about complexity in thinking and task completion using content knowledge ***not*** difficulty

MAKING CONNECTIONS

COMMON CORE STATE STANDARDS

MAKING CONNECTIONS

MAKING CONNECTIONS

- The new Common Core State Standards were developed to help schools focus students on college and career readiness.

- As such the standards are "fewer, higher and deeper" and focus schools on supporting the deeper learning of content that translates into a deeper application of knowledge and skills.

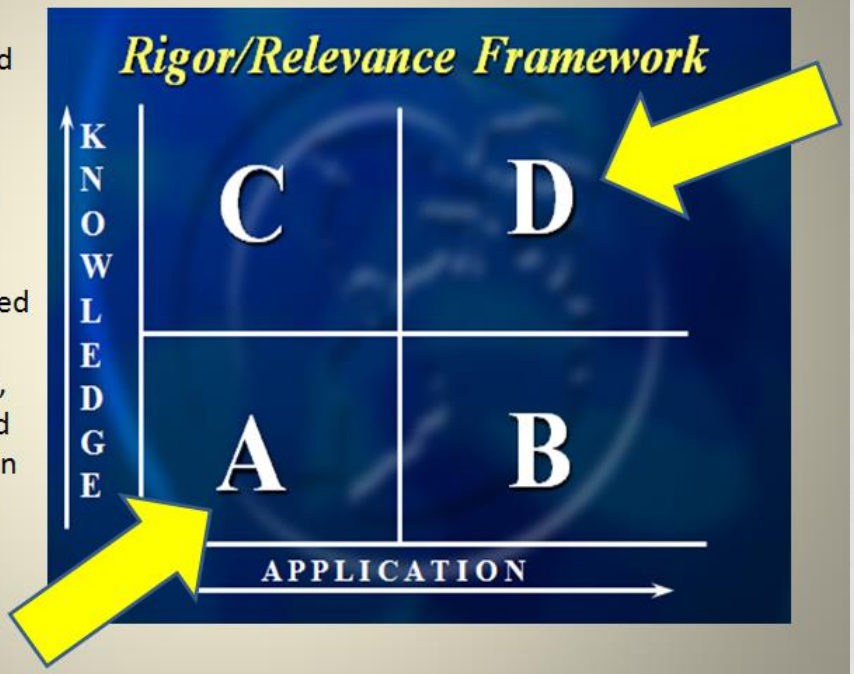
COMMON CORE STATE STANDARDS

How more rigorous are these new standards?

Rigor/Relevance Framework

In the past State tests used closed responses and multiple choice items resulting in low rigor/low relevance (A).

The new assessments based on CCSS will include performance-based tasks, open ended questions and application which results in high rigor/high relevance (D).



COMMON CORE STATE STANDARDS

Educators will need to shift how they teach and assess

Preparing students now to be ready for those types of assessments is the reality for teachers in the next few years.

Shift from rote learning to critical thinking and application.

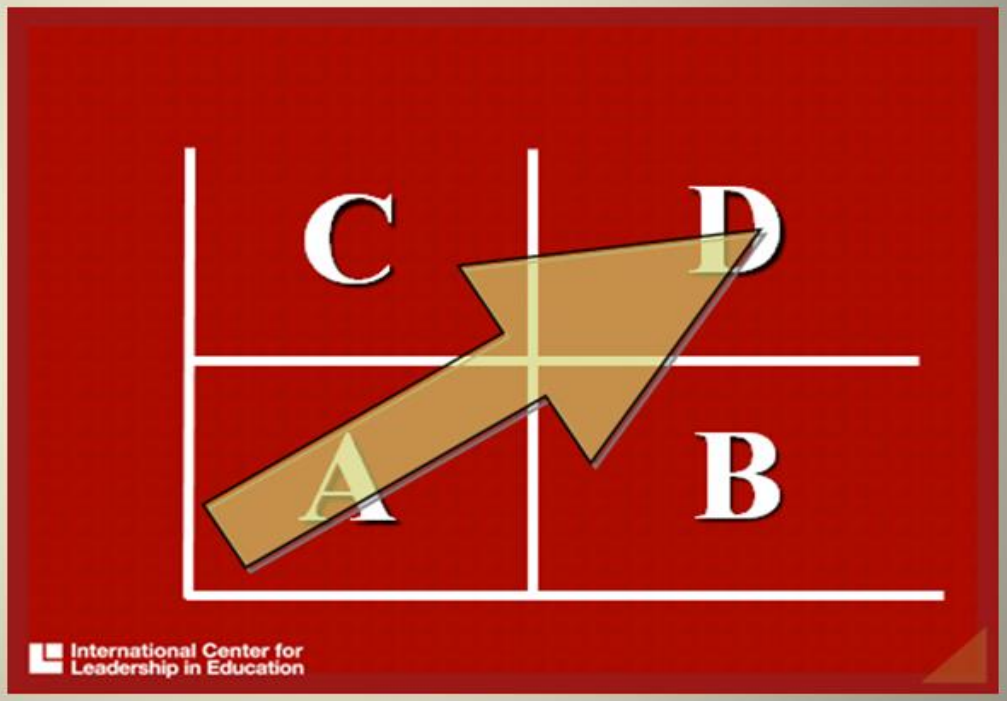
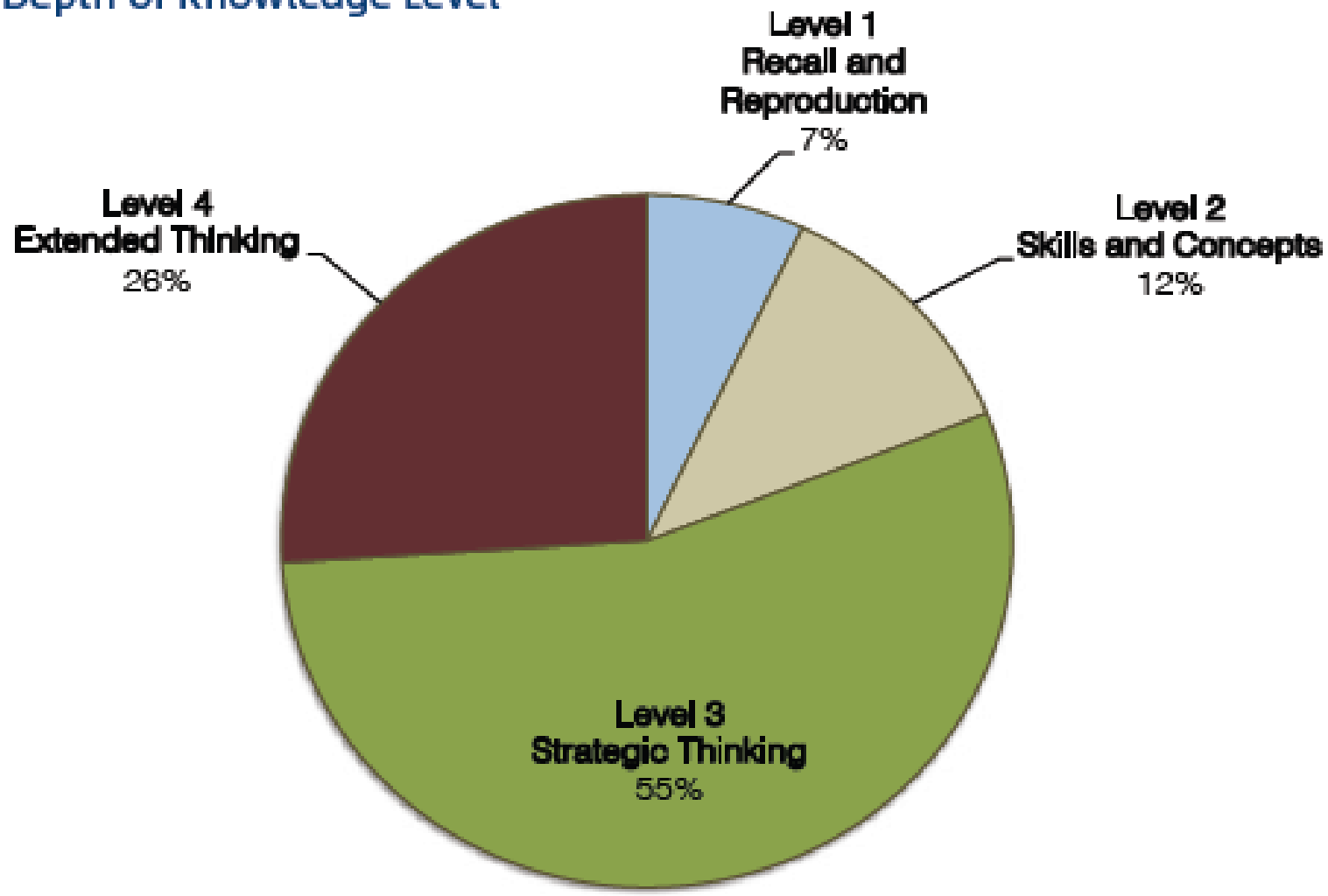
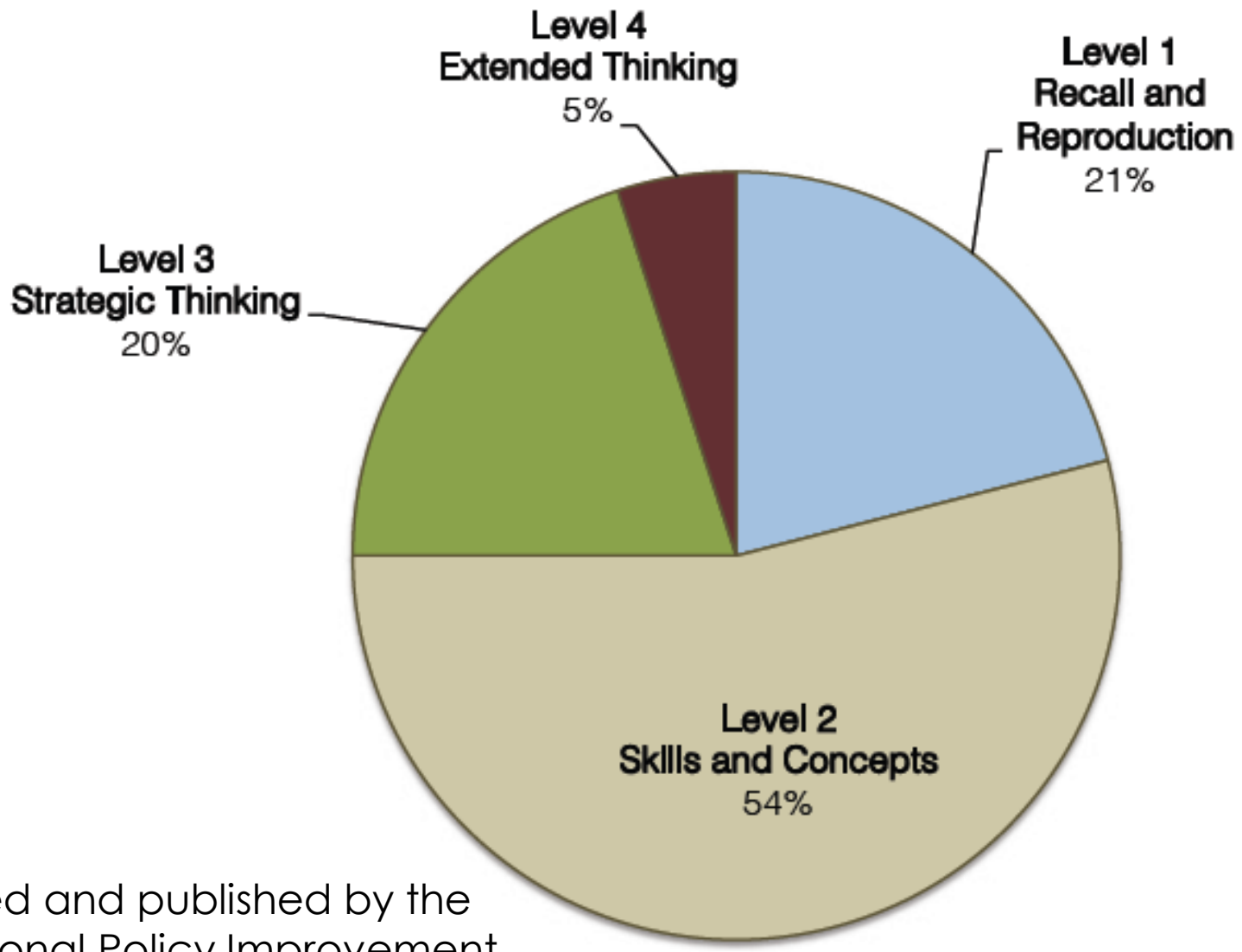


Figure 8. Percent of Common Core ELA and Literacy Standards at each Depth of Knowledge Level



Prepared and published by the Educational Policy Improvement Center

Figure 12. Percent of Common Core Mathematics Standards at each Depth of Knowledge Level



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MIND SHIFTS

Mind Shift	Description
1. The goal of curriculum should not be the coverage of content, but rather the discovery of content.	Standards dictate what students should learn, but not how the content should be taught. Curriculum now should be written around the performance desired from our students as a result of their investigations into a variety of concepts, skills, and strategies. These need to be developed across content areas.
2. A deep understanding of the content to be taught is paramount	In order to effectively plan lessons, deliver high quality instruction, and analyze student progress, we need to have a deep and flexible understanding of the content we teach. With this deep understanding comes the ability to anticipate students' misconceptions, see the linkages between ideas, and make explicit connections to real life.

MIND SHIFTS

Mind Shift	Description
3. In our classrooms, it is the students' voices, not the teachers', that are heard	What the standards demand from our students is a greater focus on metacognitive activities that encourage them to reflect and talk about their own understandings and beliefs, while listening to the understandings, reactions, and motivations of others.
4. We are preparing our students to do the learning without us	Our students need to be taught persistence and the importance of stamina. The ability to apply strategies, construct arguments, create representations, persevere when solving problems, employ technology, critique, and understand the perspectives of others, will come from the sophisticated work that educators do in preparing students to be independent.

MIND SHIFTS

Mind Shift	Description
5. We are educating our children for an unknown future	As the change agents in the education of our children, we need to push ourselves to consider a new direction for our teaching and its impact on our children's tomorrow. We are no longer educating for today, but rather preparing our students for a future where they will need to think, innovate, collaborate, problem solve, and compete globally.
6. We have a responsibility to help each student reach higher	Great respect should be awarded for the complexity of the art of teaching. In order to move our students to rigorous standards, we need an even more extensive repertoire of instructional strategies than ever before
7. We can't ignore the evidence before us	Research indicates that the use of formative assessment to guide instruction causes great gains in student achievement. At the outset of any unit or lesson should be the identification of evidence that the students' will have successfully met expectations.

SMARTER BALANCED ASSESSMENT

MAKING CONNECTIONS

SMARTER BALANCED ITEM TYPES

- Four Major Types of Items
  - Selected Response*
  - Constructed Response*
    - Extended Constructed Response (ECR) (Math)
  - Technology Enhanced*
  - Performance Tasks

*Any of these item types may be computer adaptive (CAT)

RIGOR OF THE SBAC

FIGURE 1. The Percentage of Smarter Balanced Test Items at Each of the Four Levels of Norman Webb's Depth-of-Knowledge Framework.

Depth-of-Knowledge Level	English Language Arts	Math
Level 1. Draws on basic knowledge and rote learning	25%	24%
Level 2. Requires some application of what's been learned and some cognitive processing	38%	40%
Level 3. Requires the ability to research, synthesize, reason with evidence, and communicate effectively	26%	25%
Level 4. Requires extended planning, research, and problem solving that call on students' self-management and metacognitive skills	11%	11%

New Assessments; New Rigor by Joan Herman & Robert Linn *Educational Leadership* March 2014

TECHNOLOGY ENHANCED

- **Website**
- http://sampleitems.smarterbalanced.org/itempreview/sbac/ELA.htm

PERFORMANCE TASKS (PT)

- Performance tasks, the most complex of all items, include the following elements:
  - Integrate knowledge and skills across multiple claims.
  - Measure capacities such as depth of understanding, research skills, and/or complex analysis with relevant evidence.
  - Require student-initiated planning, management of information/data and ideas, and/or interaction with other materials.
  - Reflect a real-world task and/or scenario-based problem
  - Allow for multiple approaches.
  - Represent content that is relevant and meaningful to students.
  - Allow for demonstration of important knowledge and skills.

PT SAMPLE: PRIOR TO TEST DATE

Grade 7 Mathematics Sample PT Form

Prework: (Prior to the start of Session 1)

In preparation for this task, the teacher will guide a brief class discussion about the considerations that need to be made when remodeling a bedroom. The teacher will explain that "wood flooring" is any product manufactured from timber that is designed as a permanent covering for a floor. The teacher will explain that a "coat of paint" is a thin layer of paint covering a surface. The teacher will explain that for some types of paint, more than one coat of paint may be applied to the surface that is being painted. The teacher will explain that the budget for a remodeling project must account for the cost of all materials used as well as the cost of labor.

Prework: (Prior to the start of Session 2)

The teacher will explain that a "floor plan" for a room is a scale diagram showing the view from above of the relationship between the pieces of furniture in the room. The teacher will explain that an "heirloom" is a valued possession passed down through the generations of a family.

PT SAMPLE: STIMULI AND TASKS

Grade 7 Mathematics Sample PT Form

Smarter Balanced Assessment Consortium

Remodeling a Bedroom

Session 1

You are remodeling a bedroom for a client. Your job will include installing new flooring, painting the walls, buying new furniture, and then arranging the new furniture in the bedroom. Your client has set a total budget of $4500 for this project.

Part A

New Flooring

The bedroom floor is in the shape of a rectangle. It is 15 feet long and 12 feet wide.

Your client has requested that you install either oak flooring or maple flooring.

The oak flooring costs $6.75 per square foot for materials.

The maple flooring costs $8.00 per square foot for materials.

The cost you charge for labor will be the same for either flooring option.

How much money will your client save if you install oak flooring instead of maple flooring? Explain or show your reasoning. You may use diagrams, drawings, or equations as well as words.

PT SAMPLE: STIMULI AND TASKS

Part B

Paint the Walls

The height of the bedroom is 9 feet. There are 4 rectangular windows in the room that are each 30 inches wide and 36 inches high. You will **not** paint the windows, the floor, or the ceiling. You will paint the rest of the room, including the door. Your client likes two colors, *Light-at-Dawn* and *Cloudy Sunrise*. Both colors are only available in 1-gallon cans.

Light-at-Dawn: The regular price of a 1-gallon can is $24, but it is on sale for 25% off the regular price. This type of paint requires 2 coats.

Cloudy Sunrise: The price of a 1-gallon can is $28. This type of paint only requires 1 coat.

Each gallon of paint will cover an area of about 350 square feet.

Your client has stated that if the cost for using *Cloudy Sunrise* is no more than 5% greater than the cost for using *Light-at-Dawn*, then you should use *Cloudy Sunrise*.

Which paint color should you use? Explain or show your reasoning. You may use diagrams, drawings, or equations as well as words.

PT SAMPLE: STIMULI AND TASKS

Part C

Estimate the Total Cost for Materials and Installation

Your client has requested an estimate of the total cost of installing new flooring and painting the walls.

Make a detailed estimate of the total cost of installing new oak flooring and painting the walls. The total cost is the sum of the costs for materials and labor. You must decide how much you will charge the client for your labor.

- A reasonable labor charge for installing flooring is between $2.50 and $5.00 per square foot.
- A reasonable labor charge for painting the walls is between $0.75 and $1.50 per square foot.

How much money will remain from your client's original budget of $4500 after the total cost of installing new oak flooring and painting the walls has been subtracted?

$ [ ]

End of Session 1

[You will not be allowed to return to Session 1 after clicking "Submit."]

PT SAMPLE: STIMULI AND TASKS

Session 2

New Furniture Catalog

Part D

Buy New Furniture

After you installed new flooring and painted the walls, your client states that there is $2347 remaining in the budget to buy new furniture.

Your client would like you to spend as much of the remaining budget as possible.

Click on the "New Furniture Catalog" link above to shop for new furniture. You must buy the following:

- 1 bed set
- 1 mattress set
- 1 dresser
- 1 nightstand
- 1 desk

The bed set and the mattress set must be the same size.

List the pieces of furniture you will buy from the catalog.

How much money will remain in your client's budget after you purchase the furniture? Explain how you know you will spend as much of the remaining budget as possible.

PT SAMPLE: STIMULI AND TASKS

Part E

Floor Plan

Make a scale drawing of the bedroom floor on the graph paper that was provided to you. Include the dimensions in your drawing. You may use any scale you like, but the entire scale drawing must fit on one piece of graph paper. Be sure to indicate the scale you use.

Part F

Arrange the Furniture

Decide how you will arrange the new furniture, leaving room for an heirloom rug in the shape of a circle with a diameter of 6 feet. There can be no furniture arranged on top of the rug.

Make a floor plan by representing the new furniture on your scale drawing of the bedroom. Label each piece of furniture and include the dimensions in your drawing.

Explain how you know that there will be room for the heirloom rug.

INSTRUCTIONAL IMPLICATIONS

DESIGN VS. RIGOR

- While the design of the Smarter Balanced assessment is important information that we all need to be aware of, it is the rigor of the assessment that is most essential. We must match our classroom instruction and assessment strategies to match!

IMPLICATIONS FOR CLASSROOM INSTRUCTION

- Ensure a tight alignment between classroom instruction and all assessment opportunities. Teach to the level of application that students will be assessed at
- Shift from teaching to cover topic upon topic to students developing a depth of understanding. Utilize in-depth instructional strategies.
- Shift from rote learning to critical thinking. Increase the use of performance tasks and project-based learning.

IMPLICATIONS FOR CLASSROOM INSTRUCTION

- Make the formative assessment process an integral part of teaching and learning
- Create and use clear learning targets with every lesson and develop a clear, shared understanding of proficiency on those learning targets.
- Use descriptive, actionable feedback to guide inquiry and deep understanding and application of content

IMPLICATIONS FOR CLASSROOM INSTRUCTION

- Use effective questioning strategies to engage students in higher order thinking and problem solving

- DOK Question Stems

DOK 1	DOK 2
• Can you recall_____? • When did ____ happen? • Who was ? • How can you recognize____? • What is____? • How can you find the meaning of____? • Can you recall____? • Can you select____? • How would you write___? • What might you include on a list about___? • Who discovered___? • What is the formula for___? • Can you identify___? • How would you describe___?	• Can you explain how ____ effected ____? • How would you apply what you learned to develop ? • How would you compare ____? Contrast_____? • How would you classify____? • How are____alike? Different? • How would you classify the type of____? • What can you say about____? • How would you summarize____? • How would you summarize___? • What steps are needed to edit___? • When would you use an outline to ___? • How would you estimate___? • How could you organize___? • What would you use to classify___? • What do you notice about___?
DOK 3	**DOK 4**
• How is ____ related to ____? • What conclusions can you draw _____? • How would you adapt____to create a different ? • How would you test____? • Can you predict the outcome if____? • What is the best answer? Why? • What conclusion can be drawn from these three texts? • What is your interpretation of this text? Support your rationale. • How would you describe the sequence of____? • What facts would you select to support____? • Can you elaborate on the reason____? • What would happen if___? • Can you formulate a theory for___? • How would you test___? • Can you elaborate on the reason___?	• Write a thesis, drawing conclusions from multiple sources. • Design and conduct an experiment. Gather information to develop alternative explanations for the results of an experiment. • Write a research paper on a topic. • Apply information from one text to another text to develop a persuasive argument. • What information can you gather to support your idea about___? • DOK 4 would most likely be the writing of a research paper or applying information from one text to another text to develop a persuasive argument. • DOK 4 requires time for extended thinking.

IMPLICATIONS FOR CLASSROOM INSTRUCTION

- Make active reflection an integral part of learning as students become Self and Peer Assessors

- Encourage and provide opportunity for students to transfer knowledge from one content area to another both within and across subject areas.

IMPLICATIONS FOR CLASSROOM INSTRUCTION

- Make learning from and correcting mistakes an embedded process within then teaching and learning process. Show kids how to learn from errors and improve toward proficiency
- Give every student the opportunity for Success
- Give students the gift of struggle.

INSTRUCTIONAL IMPLICATIONS

- Balance student tasks, activities and problems to target procedural skill and fluency, conceptual understanding, and real world application

SHIFTS IN ELA/ LITERACY

Shift 1	Balancing Informational & Literary Text	Students read a true balance of informational and literary texts.
Shift 2	Knowledge in the Disciplines	Students build knowledge about the world (domains/ content areas) through TEXT rather than the teacher or activities
Shift 3	Staircase of Complexity	Students read the central, grade appropriate text around which instruction is centered. Teachers are patient, create more time and space and support in the curriculum for close reading.
Shift 4	Text-based Answers	Students engage in rich and rigorous evidence based conversations about text.
Shift 5	Writing from Sources	Writing emphasizes use of evidence from sources to inform or make an argument.
Shift 6	Academic Vocabulary	Students constantly build the transferable vocabulary they need to access grade level complex texts. This can be done effectively by spiraling like content in increasingly complex texts.

ELA INSTRUCTIONAL IMPLICATIONS

1. Regular practice for *all* students with complex text and its academic vocabulary

2. Reading and writing (speaking and listening) grounded in evidence from text

3. Building knowledge through content-rich nonfiction and informational texts

SHIFTS IN MATHEMATICS

Shift 1	Focus	Teachers significantly narrow and deepen the scope of how time and energy is spent in the math classroom. They do so in order to focus deeply on only the concepts that are prioritized in the standards.
Shift 2	Coherence	Principals and teachers carefully connect the learning within and across grades so that students can build new understanding onto foundations built in previous years.
Shift 3	Fluency	Students are expected to have speed and accuracy with simple calculations; teachers structure class time and/or homework time for students to memorize, through repetition, core functions.
Shift 4	Deep Understanding	Students deeply understand and can operate easily within a math concept before moving on. They learn more than the trick to get the answer right. They learn the math.
Shift 5	Application	Students are expected to use math and choose the appropriate concept for application even when they are not prompted to do so.
Shift 6	Dual Intensity	Students are practicing and understanding. There is more than a balance between these two things in the classroom – both are occurring with intensity.

MATH INSTRUCTIONAL IMPLICATIONS

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with Mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

ASSESSMENT IMPLICATIONS

IMPLICATIONS FOR CLASSROOM ASSESSMENT

- Assessments need to evolve to be more rigorous and real world relevant, must match our teaching to this same standard.
- Assessments must engage students in higher-order thinking skills
- Assessments have to be more performance based.

IMPLICATIONS FOR CLASSROOM ASSESSMENT

- Portfolios of various learning artifacts and learning products need to be used by teachers and students to document growth
- Rubric development and rubric use must become an integral part of the assessment process.

IMPLICATIONS FOR CLASSROOM ASSESSMENT

- Assessment data need to be used by students to further learning
- Assessments must generate independent learners and users of data
- Assessment data must be used (by both teachers and students) in the moment to inform "next steps" in the learning process

IMPLICATIONS FOR CLASSROOM ASSESSMENT

- Assessments must show evidence of student learning over time
- Assessment systems have to be balanced with an equal mix of formative and summative information, and the
- Formative Assessment Process must be embedded in the instructional process in every classroom

NEXT STEPS

- In PLCs, have teachers work together to determine DOK levels of curriculum standards.
- Discuss what this might look like on an assessment and develop assessment items or tasks
- Dialogue around the skills and content students will need to be able to accomplish and master these tasks? What rigor?
- Think through the instructional practices teachers must begin to utilize to teach students for success on these assessments tasks, both in the classroom and on the state assessment…make them as aligned as possible

NEXT STEPS

- In PLCs discuss how the formative assessment process will give us information along the way that will help us monitor our students' progress
- Discuss how adjustments might need to occur to get students to proficiency or mastery
- Review summative, classroom assessments, ensure they are designed in a similar fashion and represent the rigor required for mastery
- Create an Action Plan

QUESTIONS

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