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# Differentiate Up! A Guide to Plan and Organize Differentiation

NAGC November 10, 2023



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Kenneth J. Wright<sup>1</sup>, Luis O. Ferreira<sup>1</sup>



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University of Connecticut-1 and William & Mary-2

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## Project BUMP UP

Funded by Jacob K. Javits Gifted and Talented Students Education Program,  
U.S. Department of Education PR/Award # S206A190028

- Co-planning and co-teaching
- Classroom teachers and gifted specialists
- Differentiate for mathematically advanced learners in heterogeneous 4th and 5th grade classrooms

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# Opportunities!

- Interested in doing acceleration better?  
**[ncrge.uconn.edu/acceleration](https://ncrge.uconn.edu/acceleration)**
- Identify more EL students with math talent  
**[identifygifted.education.uconn.edu](https://identifygifted.education.uconn.edu)**
- Validate the new Renzulli Executive Function Scale
- Parents – **[s.uconn.edu/refs](https://s.uconn.edu/refs)**
- Teachers – **[s.uconn.edu/renzulliscale](https://s.uconn.edu/renzulliscale)**








 Parent Code
 Teacher Code


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# Resources abound!

Project BUMP UP Web Page – Differentiation Resources tab  
<https://projectbumpup.education.uconn.edu>











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## Differentiation Planning Guide

- Math Example
- Student Data— Curriculum Compacting
- Differentiating through
  - Alternative standards
  - Supplemental sources
  - Tiering for cognitive complexity
    - Increasing Depth of Knowledge

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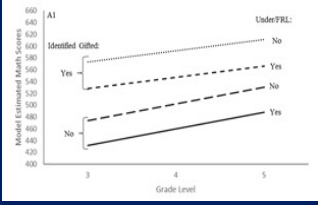
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## Why differentiate for math?

**Gr. 3—5 student growth** (Long et al., 2019).


**Standards do not eliminate the need for accelerative options** (Assouline et al., 2015).

**Skills, motivation, and perseverance to reach math potential** (NCTM, 2000; Wilkins et al., 2016).





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## Six Principles of Differentiation



- Moderated level of challenge
- Students differ in skills and knowledge
- Interest fuels motivation, engagement
- The right to explore areas of interest
- Multifaceted learning profiles
- Safety, support, and value foster learning



—Tomlinson & Jarvis, 2009

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## DIFFERENTIATION IS NOT...

**JUST WHEN YOU THINK YOUR WORK IS DONE ...**




**LOOK! MORE WORK, MORE WORK EVERYWHERE!**

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# Project BUMP UP Differentiation Log




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Differentiation Planning Guide


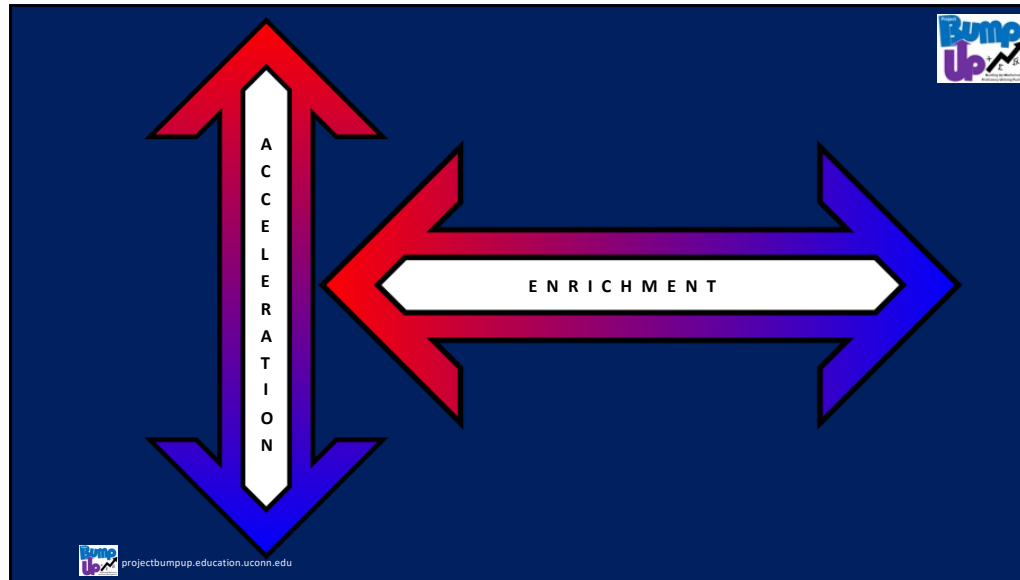
Unit: _____ Lesson: _____	Date: _____	<b>Grouping of Advanced Students</b> <input type="checkbox"/> Whole Class <input type="checkbox"/> Flexible Group <input type="checkbox"/> Individual
<b>Standard(s) for Today's Lesson</b>		
Standard(s) <input type="checkbox"/>		
<b>Differentiation</b>		
<b>Content From a Supplemental Source</b>  Topic: _____ Source: _____ DOK Level 3 __ or Level 4 __? Brief description of differentiated activity:	<b>Differentiation of the Standard Selected Above</b> <input type="checkbox"/> Math differentiation option from the textbook for this lesson.* Page ____ Activity Number(s) _____ DOK Level 3 __ or Level 4 __? and/or <input type="checkbox"/> DoK Differentiated to: Level 3 __ Level 4 __? Brief description of differentiated activity:	<b>Alternative Standard</b>  Grade ____ Standard _____ DOK Level 3 __ or Level 4 __? Brief description of differentiated activity:
<b>Other/Notes</b>		



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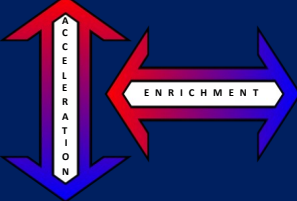
**Selecting Standards**

- Higher Standards or Those You Do Not Normally Reach

The slide features a smaller version of the 'ACCELERATION' and 'ENRICHMENT' arrows in the top left. The main content includes the word 'STANDARDS' in blue 3D block letters above a white tree diagram with red and blue outlines. A green 3D person icon stands on one of the tree's nodes. A yellow dashed line points from the person icon to the 'STANDARDS' text. A yellow semi-circle is in the bottom right corner. The 'Bump Up' logo is in the top right. At the bottom, there is a small Creative Commons license notice: 'This Content by Unknown Author is licensed under CC BY'.

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## Advanced Resources Units

Grade	K-1	2	3	4	5	6
Thinking Like A Mathematician			x			
Concept-Based Units						
Splash	x					
Spatial Reasoning		x	x	x		
Polygons Galore!			x	x	x	
Beyond Base Ten			x	x	x	x
Moving Through Dimensions						6-8
Math Curriculum for Gifted Students			x	x	x	x




<https://education.wm.edu/centers/cfge/curriculum/mathematics/materials/index.php>

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## Open-ended, Real-world, Problem and Project-based Learning


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## Tiering for Cognitive Complexity

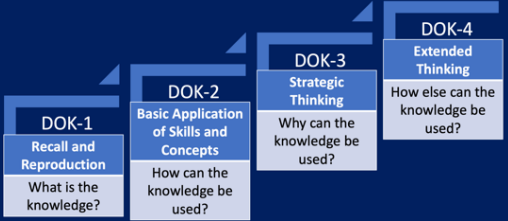


ENRICHMENT





Recall and Reproduction  
 Basic Application of Skills and Concepts  
 Strategic Thinking  
 Extended Thinking




**DOK-1**  
 Recall and Reproduction  
 What is the knowledge?

**DOK-2**  
 Basic Application of Skills and Concepts  
 How can the knowledge be used?

**DOK-3**  
 Strategic Thinking  
 Why can the knowledge be used?


**DOK-4**  
 Extended Thinking  
 How else can the knowledge be used?


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## Steps for Leveling-up DOK



ENRICHMENT

1. Analyze

- What is being asked of the students?
- What is the **DOK** level?

2. Determine


- Where do we see a similar concept in future standards?
- Where can we provide **less scaffolding**?
- What **other questions** can we ask about this problem?

3. Construct

- Select from the standards and/or additional questions created.
- Rewrite the problem to remove scaffolding and insert updated elements.

4. Re-Evaluate

Now that you have leveled-up the question, re-evaluate what students are being asked to do at the new DOK level.


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# Student Data Curriculum Compacting


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## STUDENT A

Item	Description	Points	Score	Proficiency
<b>SC.7.P.11. Energy Transfer and Transformations - A. Waves</b>				
SC.7.P.11.1	Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.	3	3	100%
SC.7.P.11.2	Investigate and describe the transformation of energy from one form to another.	4	3	75%
SC.7.P.11.3	Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.	1	1	100%
SC.7.P.11.4	Observe and describe that heat flows in predictable ways, moving from warmer objects to cooler ones until they reach the same temperature.	3	3	100%
<b>Overall Proficiency</b>		<b>11</b>	<b>11</b>	<b>100%</b>
<b>Proficiency Level</b>		<b>11</b>	<b>11</b>	<b>100%</b>

## STUDENT B

Item	Description	Points	Score	Proficiency
<b>SC.7.P.11. Energy Transfer and Transformations - A. Waves</b>				
SC.7.P.11.1	Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.	3	3	100%
SC.7.P.11.2	Investigate and describe the transformation of energy from one form to another.	4	4	100%
SC.7.P.11.3	Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.	1	1	100%
SC.7.P.11.4	Observe and describe that heat flows in predictable ways, moving from warmer objects to cooler ones until they reach the same temperature.	3	3	100%
<b>Overall Proficiency</b>		<b>11</b>	<b>11</b>	<b>100%</b>
<b>Proficiency Level</b>		<b>11</b>	<b>11</b>	<b>100%</b>


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## MEETING THE NEEDS OF EVERY STUDENT?

Elementary and middle school teachers could eliminate between 40%-70% of the regular curriculum for 10%-15% of students in mixed ability classes

Reis et al. (1998)

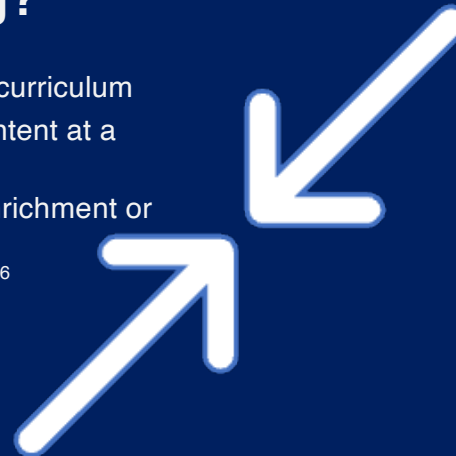


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## What is compacting?

- Streamlines/eliminates regular curriculum
- Students who can complete content at a faster pace
- Time can be used to provide enrichment or acceleration

Reis et al., 2016



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**In the Classroom**

- **Class goals**
  - Mastery of benchmark
  - Differentiated learning according to student level
- **Meeting students' needs**
  - Pre-tests to guide instruction
  - Students who show mastery will compact out
  - Compacted students receive grades based on their demonstrated mastery and alternative work.



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**Name it**

- What is in the unit?
- Deconstruct the standard(s)

- 1
- 2
- 3

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## Prove it

- Measure mastery\* of content and skills

*\*Mastery does not mean they know everything*

1

2

3

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## Prove It Examples

- Pre-test (version of the post-test)
- Open-ended large concept question
- Pre-unit challenge lesson
- Verbal questioning
- Probes
- Asking students to perform a skill
- Answer the essential question(s)



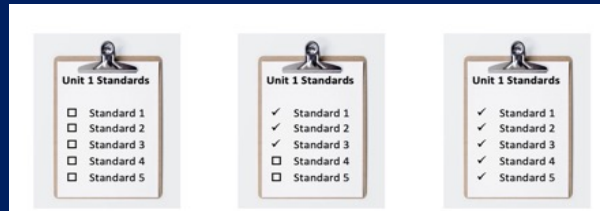
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# Pre-assessment

60% or above on all standards

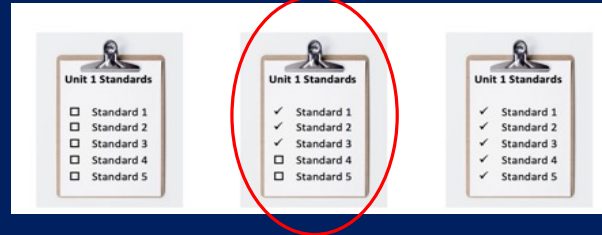
Or

60% or above on most standards



**Students Who Know:**

**Are Students Who Need:**



## One way the data could present

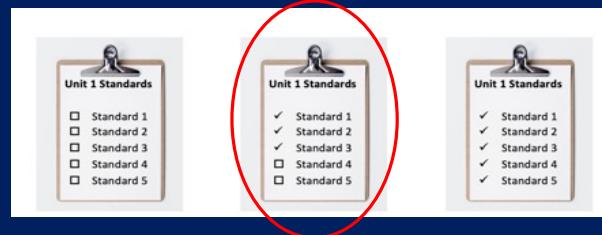
- 60% or above on all standards
  - Would benefit from instruction and practice for those elements they need
    - Formative assessment success – go on to something else
    - Formative assessment not yet – full curriculum and instruction



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## Another way the data could present

- Over 60% or above on 3 out of 5 standards
  - Compact out of those 3 standards
  - Provide instruction and limited practice for the additional 2 standards
    - Formative assessment success – go on to something else
    - Formative assessment not yet – full curriculum and instruction



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## Change it

- Advanced standards
- Supplemental sources
- Tiering for cognitive complexity
- Increasing Depth of Knowledge

1

2

3

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## Selecting Advanced Resources



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# William & Mary Math Units

Grade	K-1	2	3	4	5	6
Thinking Like A Mathematician			x			
<b>Concept-Based Units</b>						
Splash	x					
Spatial Reasoning		x	x	x		
Polygons Galore!			x	x	x	
Beyond Base Ten			x	x	x	x
Moving Through Dimensions						6-8
Math Curriculum for Gifted Students			x	x	x	x

<https://education.wm.edu/centers/cfge/curriculum/mathematics/materials/index.php>

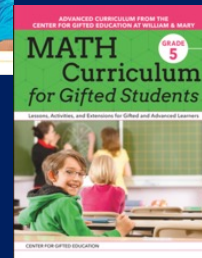
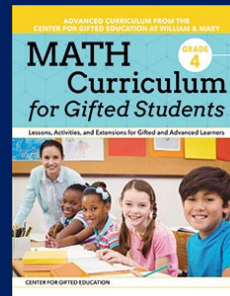


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# Math Curriculum for Gifted Students



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## Open-ended, Real-world Problem or Project- based Learning



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## Project- and Problem-Based Learning



### Both

- Open-ended
- Authentic tasks
- Build 21<sup>st</sup> century skills
- Longer than usual lessons and assignments



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<https://www.edutopia.org/blog/pbl-vs-pbl-vs-xbl-john-larmer>

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# Not necessary to reinvent . . .

- <https://www.youcubed.org/tasks/>
- <https://robertkaplinsky.com/lessons/>
- <https://hcpss.instructure.com/courses/107/pages/three-act-tasks>





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# Alternative standards

Can we can go further or deeper?



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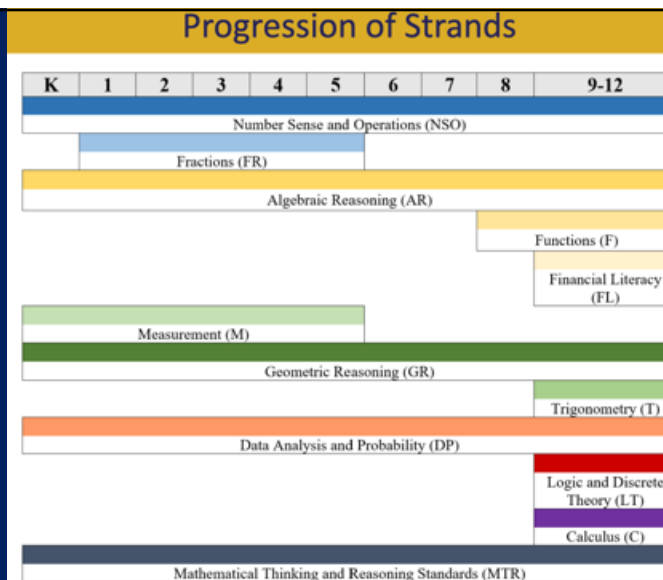
## Selecting Standards You Do Not Normally Reach



- Sub-standards you do not have as much time to address
- Standards at the end of the year

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## Selecting Higher Grade Standards



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## For example...



- Gr. 4.NSO.1.1: Express how the value of a digit in a multi-digit **whole number** changes if the digit moves one place to the left or right.
- Gr. 5.NSO.1.1: Express the value of a digit in a multi-digit number with **decimals** to the thousandths changes if the digit moves one or more places to the left or right.
- Gr. 6.NSO.1.1: 1.1: Extend previous understanding of numbers to define rational numbers. **Plot, order, and compare rational numbers.**

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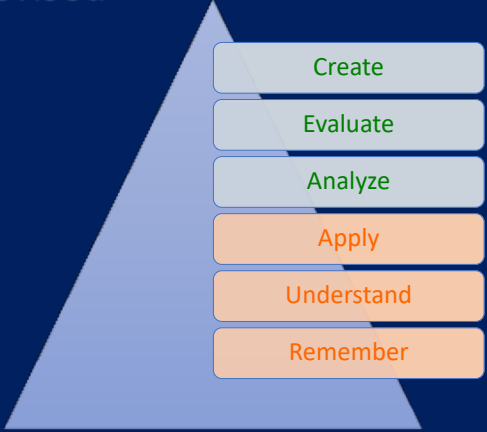
## Tiering for cognitive complexity

Bloom's Taxonomy  
Webb's Depth of Knowledge

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# Bloom's Revised Taxonomy

(Anderson & Krathwohl, 2002)



HIGHER Order Thinking Skills

LOWER Order Thinking Skills



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Overlap

Context matters:  
DOK

Definitions	I. Remembering	II. Understanding	III. Applying	IV. Analyzing	V. Evaluating	VI. Creating
<b>Bloom's Definition</b> Exhibit memory of previously learned material by recalling facts, words, basic concepts, and answers.	Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.	Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	Combine information together in a different way by combining elements in a new pattern or proposing alternative solutions.	
<b>Verbs</b>	<ul style="list-style-type: none"> <li>• Choose</li> <li>• Define</li> <li>• Find</li> <li>• How</li> <li>• Label</li> <li>• List</li> <li>• Match</li> <li>• Name</li> <li>• Omit</li> <li>• Recall</li> <li>• Relate</li> <li>• Select</li> <li>• Show</li> <li>• Spell</li> <li>• Tell</li> <li>• What</li> <li>• When</li> <li>• Where</li> <li>• Which</li> <li>• Who</li> <li>• Why</li> </ul>	<ul style="list-style-type: none"> <li>• Classify</li> <li>• Compare</li> <li>• Contrast</li> <li>• Illustrate</li> <li>• Relate</li> <li>• Rephrase</li> <li>• Show</li> <li>• Summarize</li> <li>• Translate</li> </ul>	<ul style="list-style-type: none"> <li>• Apply</li> <li>• Explain</li> <li>• Interpret</li> <li>• Organize</li> <li>• Plan</li> <li>• Select</li> <li>• Solve</li> <li>• Utilize</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze</li> <li>• Assume</li> <li>• Categorize</li> <li>• Compare</li> <li>• Conclude</li> <li>• Contrast</li> <li>• Discover</li> <li>• Dissect</li> <li>• Distinguish</li> <li>• Divide</li> <li>• Examine</li> <li>• Examine</li> <li>• Function</li> <li>• Inference</li> <li>• Inspect</li> <li>• List</li> <li>• Motive</li> <li>• Relate</li> <li>• Simplify</li> <li>• Survey</li> <li>• Take part in</li> <li>• Test for</li> <li>• Theme</li> </ul>	<ul style="list-style-type: none"> <li>• Agree</li> <li>• Appraise</li> <li>• Assess</li> <li>• Award</li> <li>• Choose</li> <li>• Compare</li> <li>• Conclude</li> <li>• Critique</li> <li>• Create</li> <li>• Decide</li> <li>• Deflate</li> <li>• Design</li> <li>• Develop</li> <li>• Determine</li> <li>• Discuss</li> <li>• Elaborate</li> <li>• Estimate</li> <li>• Formulate</li> <li>• Happen</li> <li>• Imagine</li> <li>• Improve</li> <li>• Invent</li> <li>• Make up</li> <li>• Maximize</li> <li>• Minimize</li> <li>• Measure</li> <li>• Modify</li> <li>• Opinion</li> <li>• Original</li> <li>• Originate</li> <li>• Plan</li> <li>• Predict</li> <li>• Propose</li> <li>• Solution</li> <li>• Solve</li> <li>• Suppose</li> <li>• Test</li> <li>• Theory</li> </ul>	



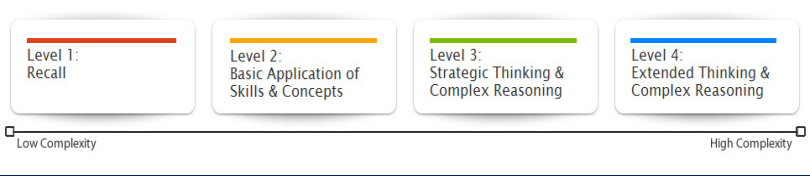
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## Webb's Depth of Knowledge (Webb, 1997)


- Number of connections of concepts
- Factors that influence cognitive demands



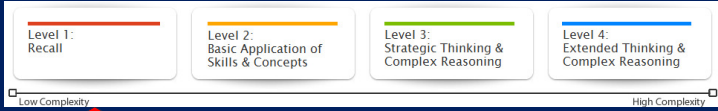
The diagram shows four levels of knowledge arranged from left to right, corresponding to increasing complexity. Each level is represented by a colored bar above a text box:

- Level 1: Recall** (Red bar)
- Level 2: Basic Application of Skills & Concepts** (Orange bar)
- Level 3: Strategic Thinking & Complex Reasoning** (Green bar)
- Level 4: Extended Thinking & Complex Reasoning** (Blue bar)

Below the boxes, a horizontal line with arrows at both ends is labeled "Low Complexity" on the left and "High Complexity" on the right.

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The diagram shows four levels of knowledge arranged from left to right, corresponding to increasing complexity. Each level is represented by a colored bar above a text box:

- Level 1: Recall** (Red bar)
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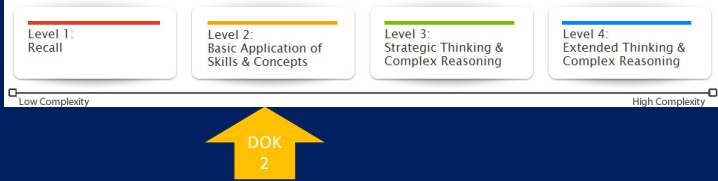
- One step
- Recall or find
- Simple algorithm or a formula
- Key words "identify," "recall," "recognize," "use," and "measure." (Webb, 2002, p. 3)

**EXAMPLE:**  
**Recognize** that  $700 \div 70 = 10$  by applying concepts of place value and division

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Level 1: Recall

Level 2: Basic Application of Skills & Concepts

Level 3: Strategic Thinking & Complex Reasoning

Level 4: Extended Thinking & Complex Reasoning

Low Complexity High Complexity


**DOK 2**

- Processing beyond a habitual response
- Decisions on solving
- Not just more than one step; more than one concept
- Visualization and probability skills (Webb, 2002, p. 4)

**EXAMPLE:**

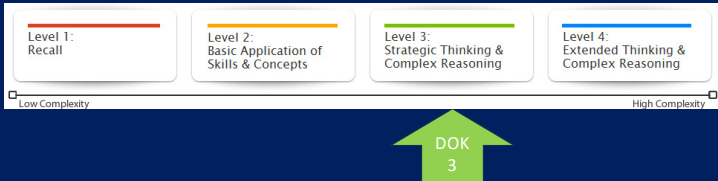
**DOK Level 2:** Jess uses powers of 10 and exponents to find the product of the following terms.  
**What are the products?**

$0.5 \times 10^5 =$  \_\_\_\_\_  $0.05 \times 10^5 =$  \_\_\_\_\_

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Level 1: Recall

Level 2: Basic Application of Skills & Concepts

Level 3: Strategic Thinking & Complex Reasoning

Level 4: Extended Thinking & Complex Reasoning


Low Complexity High Complexity

**DOK 3**

- Requires reasoning, planning, using evidence, and a higher level of thinking
- Complex and abstract
- More than one possible answer
- Justify the response
- Draw conclusions
- Cite evidence (Webb, 2002, p. 4)

**EXAMPLE:**

**DOK Level 3:** Explain why  $700 \div 70 = 10$ , including the role of place value in doing the division.

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Level 1: Recall	Level 2: Basic Application of Skills & Concepts	Level 3: Strategic Thinking & Complex Reasoning	Level 4: Extended Thinking & Complex Reasoning
Low Complexity			High Complexity

- Complex reasoning
- Extended time
- High cognitive demands
- Several connections
- Synthesizing (Webb, 2002, p. 4)

EXAMPLE:

**DOK Level 4:** For our annual food drive, we must figure out how to **ship over 400 cans**. **Decide the best shipping method** (crates, cases, or individual boxes) to use as few packages as possible. **Write a letter to the principal projecting** the amount of money the school will spend shipping the packages. **Justify** the most efficient packaging and shipping methods. (DeKalb County School District, n.d.)

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### BLOOM'S TAXONOMY

Verbs

Depth + Thinking	Level 1 Recall & Reproduction	Level 2 Skills & Concepts <small>(practical applications)</small>	Level 3 Strategic Thinking <small>(support with data, equations, models, etc.)</small>	Level 4 Extended Thinking <small>(across domains)</small>
Remember	Know math facts, terms			
Understand	Attend to precision Evaluate expressions, plot point	Model with mathematics Estimate, predict, observe, explain relationships	Construct viable arguments Geometry proof	Integrate concepts across domains
Apply	Calculate, measure, make conversions	Make sense of <b>realistic</b> problems	Make sense of <b>past</b> : realistic problems	Design & conduct a project
Analyze	Identify a pattern Locate information in table	Use tools <b>strategically</b> Classify, organize data, extend a pattern	Reason abstractly Generalize a pattern	Analyze multiple sources of evidence
Evaluate			Critique the reasoning of others	
Create				Design a complex model

### WEBB'S DEPTH OF KNOWLEDGE

Context; What follows the verbs

Depth + Thinking	Level 1 Recall & Reproduction	Level 2 Skills & Concepts	Level 3 Strategic Thinking/ Reasoning	Level 4 Extended Thinking
Remember	What is slope?			
Understand	Read, write, and represent these fractions	Explain how you solved this problem. <b>Make and explain your estimate</b>	Construct an argument to show equivalence <b>using area, set, and linear models</b>	
Apply	Convert this fraction to a decimal Add these fractions	<b>Use these data to graph your solution</b>	Conduct the investigation, interpret results, and <b>support conclusions with data</b>	
Analyze	What kind of graph or model is this? Which data point shows ____?	<b>Which graph shows how the data would be displayed?</b>	Interpret what was happening in the event? Justify your interpretation <b>using what you know about slope.</b>	
Evaluate	Which team is the best? (opinion without supporting evidence)		How would you rank these ____? <b>Justify your ranking using data that supports your critique.</b>	Some say the NFL settlement for player brain injury is not adequate. Evaluate both sides using data to determine the validity of this claim.
Create		Create a card game using fractions. Create scenarios explained by a data display.		


<https://www.karin-hess.com/free-resources>

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## DOK at a Glance

One Correct Answer?	More than one correct answer requiring evidence?
<p><b>DOK 1</b></p> <ul style="list-style-type: none"> <li>• Know or can find it (or not)</li> </ul> <p><b>DOK 2</b></p> <ul style="list-style-type: none"> <li>• More than one concept</li> <li>• If/then; cause/effect</li> </ul>	<p><b>DOK 3</b></p> <ul style="list-style-type: none"> <li>• Interpret</li> <li>• Reasoning (how and why)</li> </ul> <p><b>DOK 4</b></p> <ul style="list-style-type: none"> <li>• DOK 3</li> <li>• Additional sources</li> <li>• Initiate and complete project</li> </ul>

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### A. Given a rectangle of 8 units by 4 units, calculate the area and perimeter.

**DOK at a Glance**


One Correct Answer?	More than one correct answer requiring evidence?
<p><b>DOK 1</b></p> <ul style="list-style-type: none"> <li>• Know or can find it (or not)</li> </ul> <p><b>DOK 2</b></p> <ul style="list-style-type: none"> <li>• More than one concept</li> <li>• If/then; cause/effect</li> </ul>	<p><b>DOK 3</b></p> <ul style="list-style-type: none"> <li>• Interpret</li> <li>• Reasoning (how and why)</li> </ul> <p><b>DOK 4</b></p> <ul style="list-style-type: none"> <li>• DOK 3</li> <li>• Additional sources</li> <li>• Initiate and complete project</li> </ul>

0%




DOK 1

0%



DOK 2

0%



DOK 3

Start the presentation to see live content. For screen share software, share the entire screen. Get help at [polllev.com/app](https://polllev.com/app)

55

## B. What is the perimeter of a rectangle that measures 8 units by 4 units?

**DOK at a Glance**

One Correct Answer?	More than one correct answer requiring evidence?
DOK 1 • Know or can find it (or not)	DOK 3 • Interpret
DOK 2 • More than one concept • If/then; cause/effect	DOK 4 • DOK 3 • Additional sources • Initiate and complete project

0%

DOK 1

0%

DOK 2

0%

DOK 3

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## C. Of all rectangles with a perimeter of 24 units, which one has the most area and why?

**DOK at a Glance**

One Correct Answer?	More than one correct answer requiring evidence?
DOK 1 • Know or can find it (or not)	DOK 3 • Interpret
DOK 2 • More than one concept • If/then; cause/effect	DOK 4 • DOK 3 • Additional sources • Initiate and complete project

0%

DOK 1

0%


DOK 2

0%

DOK 3

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57


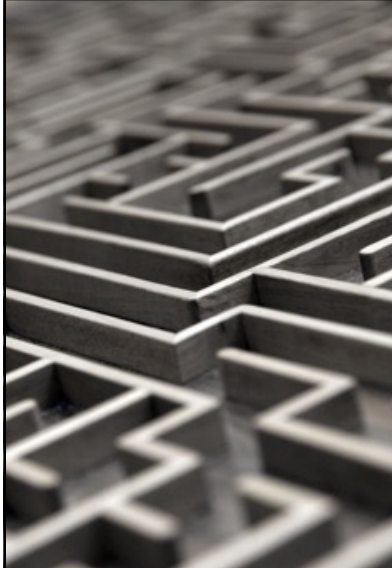


# Standard and Samples

DOK 1-4

58

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## Whole Numbers – Gr. 4

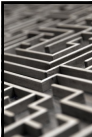
- **Use** place value understanding to round multi-digit whole numbers to any place.

**Q: What is the highest DOK Level?**

**A: DOK 1: Recall**

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## Whole Numbers – Gr. 4

**DOK Level 1:** What is 62,891 rounded to the nearest thousands?  
 (a) 60,000  
 (b) 62,000  
 (c) 62,900  
 (d) 63,000  
 (e) 70,000

**DOK Level 2:** Round the following numbers to the nearest tenth: 10.892 and 112.429


**DOK Level 3:** A teacher asked her students to use estimation to decide if the sum of the problem below is closer to 4,000 or 5,000.  
 $496 + 1,404 + 2,605 + 489 =$   
 One student replied that she thinks the sum is closer to 4,000. She used the estimation shown below to support her reasoning.  
**Is the student's reasoning correct? Explain why or why not. If the reasoning is incorrect, explain how she should have estimated it.**

$$496 + 1,404 + 2,605 + 489 =$$


$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$0 + 1,000 + 3,000 + 0 = 4,000$$

**DOK Level 4:** Create a plan to reach out to family, friends, and neighborhood members to gather data about the number of pictures they have hanging in their homes. Create a table to display the information you collect. Then decide what place value you should round to that would allow you to showcase who has most pictures and least pictures hung up in their house. Construct a poster to share your findings

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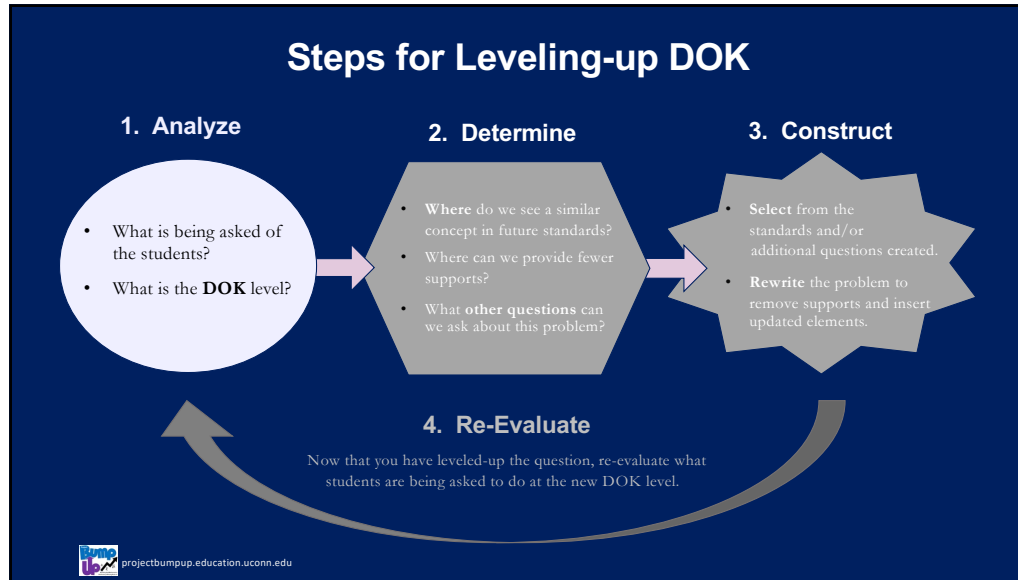


## Project BUMP UP's Leveling Up DOK 3-Step Approach

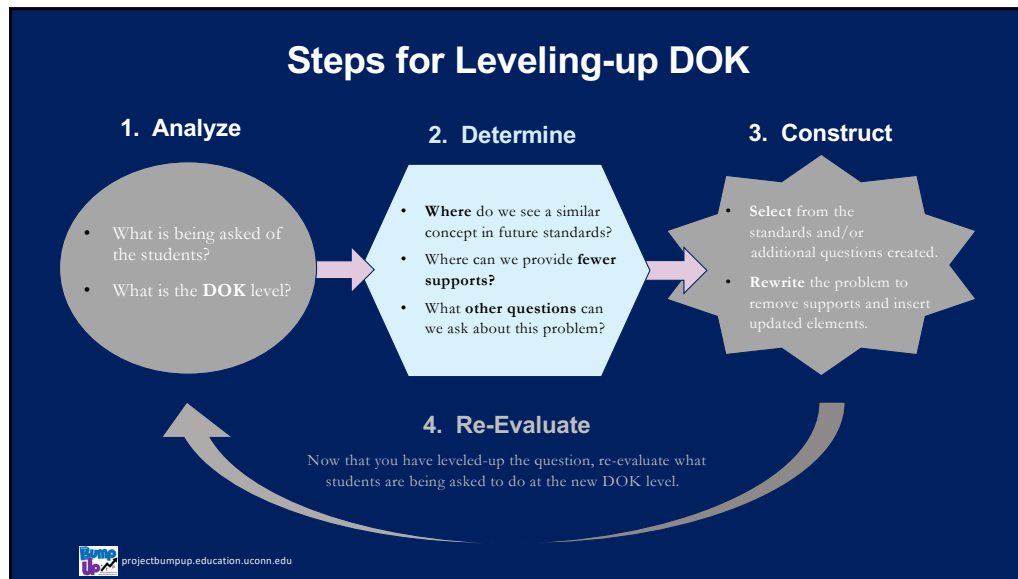
Grade 4	Grade 5
28 Standards	26 Standards
Level 1 – 9	Level 1 – 8
Level 2 – 18	Level 2 – 17
Level 3 – 1	Level 3 – 1
Level 4 – 0	Level 4 – 0

61

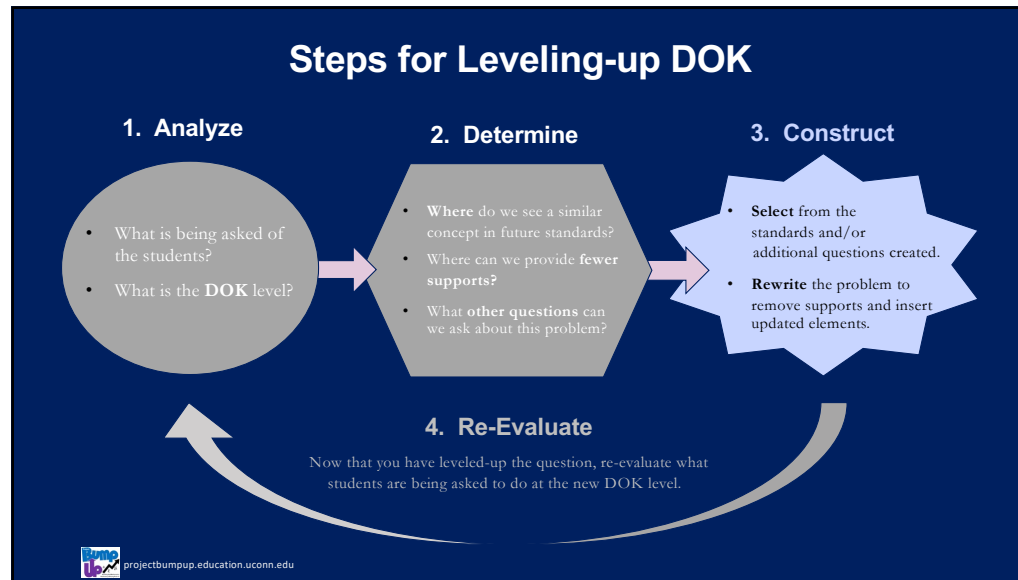
61



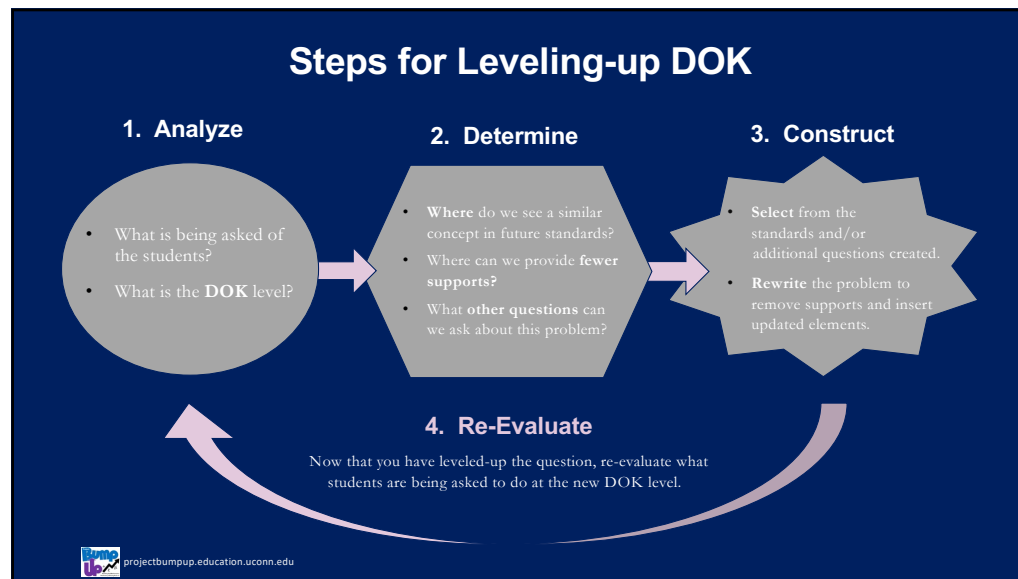
62



63



64



65



## Original Problem



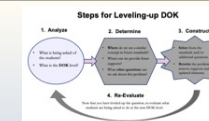
Myra read 45 pages of her 100-page book. Her sister read  $\frac{1}{2}$  of a 10-page book.  
Who read a greater fraction of her book, Myra or her sister?  
Show your work.

*Hint: One fraction has a denominator of 100. The other fraction has a denominator of 10.*

66

## Currently, what is this question asking the student to do?

- Compare fractions



Myra read 45 pages of her 100-page book. Her sister read  $\frac{1}{2}$  of a 10-page book.  
Who read a greater fraction of her book, Myra or her sister?  
Show your work.

*Hint: One fraction has a denominator of 100. The other fraction has a denominator of 10.*

67

## Currently, what is the DOK of this problem?

- DOK 2: Converting the fractions to those with similar denominators and then comparing the two fractions.



Myra read 45 pages of her 100-page book. Her sister read  $\frac{1}{2}$  of a 10-page book.  
Who read a greater fraction of her book, Myra or her sister?  
Show your work.

*Hint: One fraction has a denominator of 100. The other fraction has a denominator of 10.*

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## Looking Ahead: When will we see a similar concept like this in the future?

- Mixed fractions
- Conversions to decimals



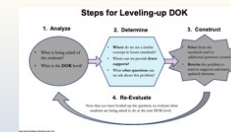
Myra read 45 pages of her 100-page book. Her sister read  $\frac{1}{2}$  of a 10-page book.  
Who read a greater fraction of her book, Myra or her sister?  
Show your work.

*Hint: One fraction has a denominator of 100. The other fraction has a denominator of 10.*

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## Where can we provide fewer supports for students?

- Eliminate the hint



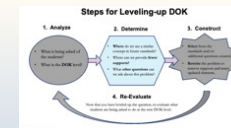
Myra read 45 pages of her 100-page book. Her sister read  $\frac{1}{2}$  of a 10-page book.  
Who read a greater fraction of her book, Myra or her sister?  
Show your work.

**~~Hint: One fraction has a denominator of 100. The other fraction has a denominator of 10.~~**

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## What other questions can we ask about this problem?

- Show two ways to answer the question, “Who read the greater fraction of her book, Myra or her sister?”
- How many pages would one sister have to read to equal the fraction the other sister read?
- Justify which sister read a greater portion of her book with evidence.
- Change the numbers for more complexity (e.g., 73 pages out of 192-page book and  $\frac{1}{8}$  of a 212-page book).



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## How can we implement these questions? (Building the new problem)

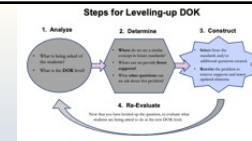
### New Problem

Myra read 73 pages of her 192-page book. Her sister read  $\frac{1}{8}$  of a 212-page book.

- Who read a greater fraction of her book, Myra or her sister? Provide evidence for your answer.

The sister who read less wants to catch up and read the same fraction as the other sister.

- How many more pages would the sister need to read to catch up? Explain your answer in two ways.



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## Now, what is this question asking the student to do?

(This should be the same as the original question/task.)

- Compare fractions



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# Now, what is the DOK of this problem?

(DOK should increase & look at Bloom's Taxonomy)

- DOK 3
  - **Explain** their thinking
  - **Another way** to approach the problem
  - **Compare** answers
  - **Analyze** their responses.

**Steps for Leveling-up DOK**

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<b>1. Points, Lines, Angles, Rays</b> (3 days)	<b>2. Classify 2D Figures</b> (9 days)	<b>3. Symmetry</b> (5 days)	<b>4. Classify Shapes and Angles</b> (2 days)
1.1: Using your knowledge... pp. 238-39	2.1: What do you know? pp. 350-351	3.1: What do you know? pp. 362-363	4.1: Introduction, modeled and guided practice
1.2: Points, Lines, and Rays pp. 240-43	2.2: Sorting Shapes Based on Side and Sorting Shapes Based on Angles – Modeled and Guided Instruction pp. 352-355	3.2: Finding Lines of Symmetry – Modeled and guided instruction pp. 364-365	4.2: Independent Practice
1.3: Parallel, Perpendicular Lines pp. 244-45	2.3: Sorting Triangles – Modeled and Guided Instruction pp. 356-357	3.3: Drawing a Line of Symmetry – Modeled and guided instruction pp. 366-367	
1.4: Identifying Points, Lines, Rays, and Angles Together... pp. 246-47	2.4: Practice Classifying Two Dimensional Figures – Guided Practice pp. 358-359	3.4: Practice Finding and Drawing Lines of Symmetry – Guided practice pp. 368-369	
1.5: Identifying Points, Lines, Rays, and Angles – Independently pp. 248-49	2.5: Practice Classifying Two-Dimensional Figures – Independent practice pp. 360-361	3.5: Practice Finding and Drawing Lines of Symmetry – Independent practice pp. 370-371	


Deciding on advanced options..

Putting It All Together

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 Curriculum Guide Differentiation Log


Differentiation for BUMP UP Students		
Content From a Supplemental Source	Differentiation of the Standard	Alternative Standard
Topic _____ Source _____ DOK Level 3 ____ or 4 ____? Brief description of differentiated math activity:	<input type="checkbox"/> Math differentiation option from the textbook for this lesson. Page ____ Activity Number(s) _____ Brief description of differentiated math activity: DOK Level 3 ____ or 4 ____? and/or <input type="checkbox"/> DOK Differentiated math to: Level 3 __ and/or Level 4 __ Brief description of differentiated math activity:	Grade ____ Standard _____ DOK Level 3 ____ or 4 ____? Brief description of differentiated math activity:

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**1.**

**Examine**  
the activity.



**2.**


**Decide**  
if the activity is advanced.  
*If it is not...*




**3.**




**Advance!**

-Increase complexity  
-Select an advanced standard  
-Choose from a supplemental source




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<p>Examine</p> 	<p>Decide</p> 	<p>Advance</p> 
Textbook Activity	Advanced?	Make it more challenging?
Write directions on how to draw a rectangle pp. 238-39	No! Six scaffolds provide students important details on rectangles. Makes it too easy.	Reduce scaffolding provided in parts a-f.

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Differentiation for BUMP UP Students		
Content From a Supplemental Source	Differentiation of the Standard	Alternative Standard
<p>Topic _____</p> <p>Source _____</p> <p>DOK Level 3 ____ or 4 ____?</p> <p>Brief description of differentiated math activity:</p>	<p><input type="checkbox"/> Math differentiation option from the textbook for this lesson.</p> <p>Page <u>5</u> Activity Number(s) <u>30</u></p> <p>Brief description of differentiated math activity:</p> <p style="text-align: center;">DOK Level 3 <u>X</u> or 4 ____?</p> <p style="text-align: center;">and/or</p> <p><input type="checkbox"/> DOK Differentiated math to: Level 3 __ and/or Level 4 __</p> <p>Brief description of differentiated math activity:</p> <p style="color: blue;">Lesson 1 - Removed scaffolding</p>	<p>Grade ____ Standard _____</p> <p>DOK Level 3 ____ or 4 ____?</p> <p>Brief description of differentiated math activity:</p>


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<p style="text-align: center;"><b>Examine</b></p> 	<p style="text-align: center;"><b>Decide</b></p> 	<p style="text-align: center;"><b>Advance</b></p> 
<p style="text-align: center;"><b>Textbook Activity</b></p>	<p style="text-align: center;"><b>Advanced?</b></p>	<p style="text-align: center;"><b>Make it more challenging?</b></p>
<p>Sorting Shapes on Side and Angles pp. 352-355</p>	<p>Parallel and perpendicular sort: lower-level questions; Repetitive of sorting activities on pp. 352, 354</p>	<p><a href="#">2.2 Advanced Activity</a>: Gr. 5 Ready Textbook pp. 323-324</p>

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Content From a Supplemental Source	Differentiation for BUMP UP Students Differentiation of the Standard	Alternative Standard
<p>Topic _____</p> <p>Source _____</p> <p>DOK Level 3 ____ or 4 ____?</p> <p>Brief description of differentiated math activity:</p>	<p><input type="checkbox"/> Math differentiation option from the textbook for this lesson.</p> <p>Page ____ Activity Number(s) _____</p> <p>Brief description of differentiated math activity:</p> <p style="text-align: center;">DOK Level 3 ____ or 4 ____?</p> <p style="text-align: center;">and/or</p> <p><input type="checkbox"/> DOK Differentiated math to: Level 3 __ and/or Level 4 ____</p> <p>Brief description of differentiated math activity:</p>	<p>Grade <u>5</u> Standard <u>G.2.3</u></p> <p style="text-align: center;">DOK Level 3 <u>X</u> or 4 ____?</p> <p>Brief description of differentiated math activity:</p> <p style="font-family: cursive;">Lesson 2 - Gr. 5 Ready Textbook pp. 323-324</p>




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<p style="text-align: center;"><b>Examine</b></p> 	<p style="text-align: center;"><b>Decide</b></p> 	<p style="text-align: center;"><b>Advance</b></p> 
<p style="text-align: center;"><b>Textbook Activity</b></p>	<p style="text-align: center;"><b>Advanced?</b></p>	<p style="text-align: center;"><b>Make it more challenging?</b></p>
<p><b>Practice Finding and Drawing Lines of Symmetry – Independent practice pp. 370-371</b></p>	<p><b>No: Describing/recognizing features. Not developing/discovering new information to deepen learning.</b></p>	<p><b>W&amp;M Grade 4 Lesson 5.2 pp. 207-209 - develop methods for finding trapezoid area</b></p>

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Content From a Supplemental Source	Differentiation for BUMP UP Students Differentiation of the Standard	Alternative Standard
<p>Topic <u>Symmetry</u></p> <p>Source <u>W&amp;M Beyond Polygons</u></p> <p>DOK Level 3 <u>X</u> or 4 ____?</p> <p><b>Brief description of differentiated math activity:</b></p> <p><i>Lesson 3 Gr. 3 Lesson 5.2 pp. 207-209: Analyzing lines of symmetry and formulating a pattern/rule about lines of symmetry and the number of sides shapes have.</i></p>	<p><input type="checkbox"/> Math differentiation option from the textbook for this lesson.</p> <p>Page ____ Activity Number(s) ____</p> <p><b>Brief description of differentiated math activity:</b></p> <p style="text-align: center;">DOK Level 3 ____ or 4 ____?</p> <p style="text-align: center;">and/or</p> <p><input type="checkbox"/> DOK Differentiated math to: Level 3 __ and/or Level 4 ____</p> <p><b>Brief description of differentiated math activity:</b></p>	<p>Grade ____ Standard ____</p> <p style="text-align: center;">DOK Level 3 ____ or 4 ____?</p> <p><b>Brief description of differentiated math activity:</b></p>


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Examine 	Decide 	Advance 
Textbook Activity	Advanced?	Make it more challenging?
Introduction, modeled and guided practice of folding shapes.	Quick exploration of folding shapes is an introduction to symmetry. Not much opportunity to understand a real-world example.	<a href="#">MIA Advanced Activity</a> : Georgia Culminating Task Geometry Town pp. 90-97
Independent Practice of polygon question	Questions are regular-polygon specific and involve identification.	

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Differentiation for BUMP UP Students		
Content From a Supplemental Source	Differentiation of the Standard	Alternative Standard
Topic <u>polygons</u> Source <u>Georgia Curriculum Frameworks</u> DOK Level 3 ___ or 4 <u>X</u> ? Brief description of differentiated math activity: <u>Lesson 4 - Geometry Town pp. 90-97</u> <a href="https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-6.pdf">https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-6.pdf</a>	<input type="checkbox"/> Math differentiation option from the textbook for this lesson. Page ___ Activity Number(s) ___ Brief description of differentiated math activity: DOK Level 3 ___ or 4 ___ ? and/or <input type="checkbox"/> DOK Differentiated math to: Level 3 ___ and/or Level 4 ___ Brief description of differentiated math activity:	Grade ___ Standard ___ DOK Level 3 ___ or 4 ___ ? Brief description of differentiated math activity:




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Multiple differentiation options in one topic/unit:

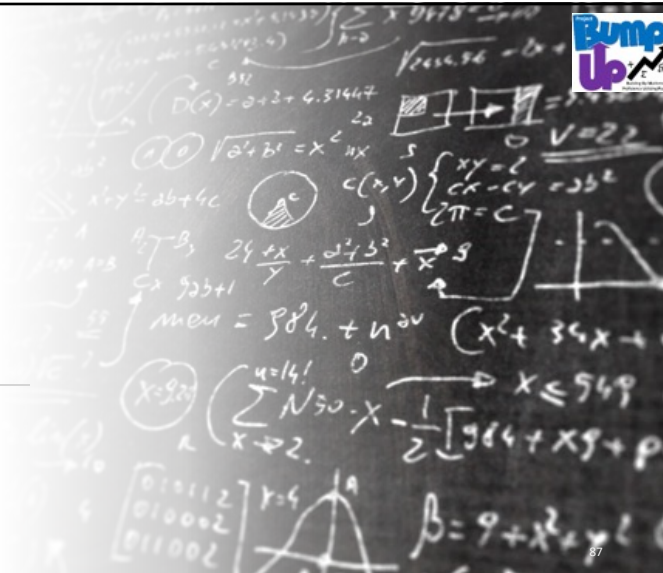
 Curriculum Guide Differentiation Log


Content From a Supplemental Source	Differentiation for BUMP UP Students	Alternative Standard
	Differentiation of the Standard	
<p>Topic <u>polygons</u></p> <p>Source <u>Georgia Curriculum Frameworks</u></p> <p>DOK Level 3 ___ or 4 <u>X</u> ?</p> <p>Brief description of differentiated math activity:</p> <p>Lesson 4 - Geometry TOWM pp. 90-97  <a href="https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-6.pdf">https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-6.pdf</a></p> <p>Symmetry w&amp;M Beyond Polygons                      Lesson 3 Gr. 3 Lesson 5.2 pp. 207-209:                      Analyzing lines of symmetry and formulating a pattern/rule about lines of symmetry and the number of sides shapes have.</p>	<p><input type="checkbox"/> Math differentiation option from the textbook for this lesson.                      Page <u>5</u> Activity Number(s) <u>30</u></p> <p>Brief description of differentiated math activity:</p> <p>DOK Level 3 <u>X</u> or 4 ___ ?</p> <p>and/or</p> <p><input type="checkbox"/> DOK Differentiated math to: Level 3 ___ and/or Level 4 ___</p> <p>Brief description of differentiated math activity:</p> <p>Lesson 1- Removed scaffolding</p>	<p>Grade <u>5</u> Standard <u>G.2.3</u></p> <p>DOK Level 3 <u>X</u> or 4 ___ ?</p> <p>Brief description of differentiated math activity:</p> <p>Lesson 2 - Gr. 5                      Ready Textbook                      pp. 323-324</p>



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Thank you!





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## Interested in sharing what your district does for subject-specific acceleration?

- The National Center for Research on Gifted Education is conducting a research study to document and disseminate information on how school districts implement subject acceleration. We would like to conduct online interviews (~ 1 hour) with knowledgeable administrators from **school districts** who have systematic procedures in place for subject acceleration. **Scan the QR code** or contact Catherine Little at [catherine.little@uconn.edu](mailto:catherine.little@uconn.edu) to learn more.



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## *Seeking schools interested in doing acceleration better?*

NCRGE is seeking schools serving grades 2-5 interested in **FREE PROFESSIONAL LEARNING OPPORTUNITIES** and *assistance in making acceleration decisions.*



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You can assist in the creation of the new  
**Renzulli Executive Functioning Scale**

*Grade 4-8 students will assess their...*

1. ability to start tasks (e.g., I like starting new things),
2. ability to stay on task (e.g., I finish what I start)
3. organization (e.g., My desk is cleaned and organized)
4. awareness of strengths and weaknesses (e.g., I know what I can do well)
5. self-advocacy (e.g., I am not afraid to stand up for myself)
6. ability to collaborate (e.g., I work well with others)
7. awareness of ability to manage emotions (e.g., I can calm myself down when I am upset.)

Parents – **[s.uconn.edu/refs](https://s.uconn.edu/refs)**

Teachers – **[s.uconn.edu/renzulliscale](https://s.uconn.edu/renzulliscale)**




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 Parent Code  Teacher Code

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Dr. Joy Lawson Davis

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- **FEBRUARY 10, 2024** - CREATIVITY
- **APRIL 20, 2024** - TWICE EXCEPTIONALITY AND NEURODIVERSITY

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