

Mar 7th, 10:30 AM - 11:45 AM

# Rigor Demystified, Now What?: Applying & Aligning Webb's Depth of Knowledge to Literacy & Math Instruction.

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# **Demystifying Rigor: Dissecting Webb's Depth of Knowledge for the Classroom**

**Kelly Brooksher & Barbara Serianni**

**ARMSTRONG STATE UNIVERSITY**

# Schedule

- Session is from 10:30-11:45 [75 min]
- Pedagogical implications under DOK [30 min]
- Practical tips: Instructional activities and assessments [20 min]
- Groups/collaboration [10 min]
- Questions [10 mins]
- Fluff time for “left turns” [5 min]





knowledge

skills

career

students

postsecondary

school

college

ready

education

high

academic

prepared training schools workplace

core mathematics thinking also expectations succeed English

content rigorous states remedial

job refers solving

successful subject assessments traditional family

student study graduation

experience preparation include

percentage four-year necessary research work essential

problem success even higher-order goals

without components pathways

young college-level program supports complete

writing and content rigorous states remedial

job refers solving

successful subject assessments traditional family

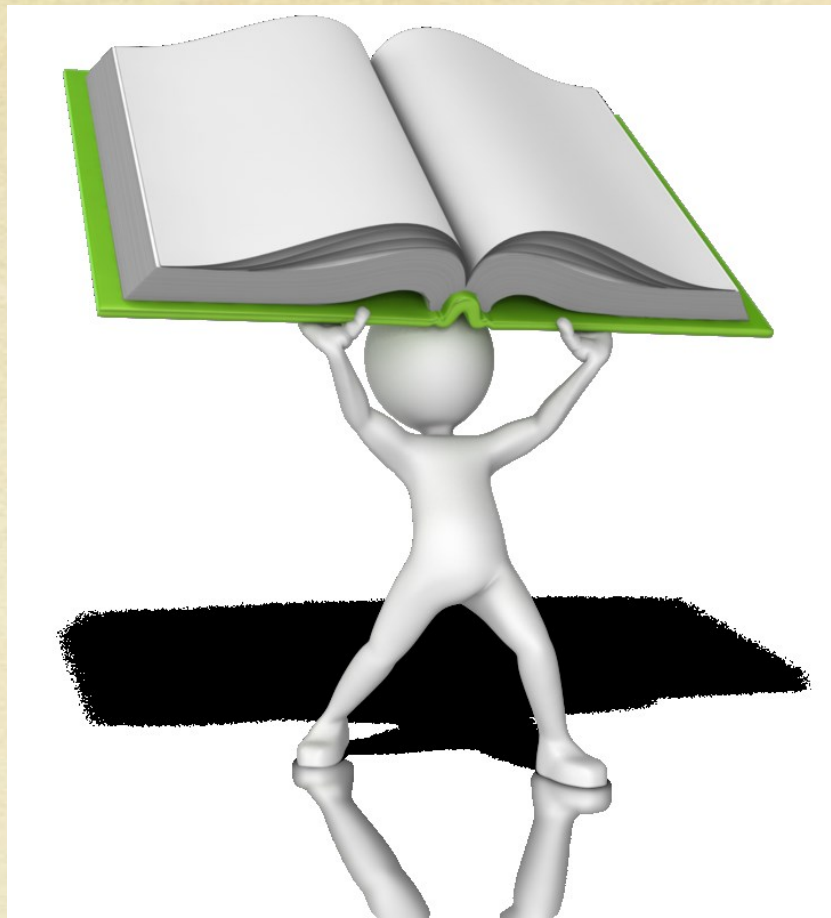
student study graduation

experience preparation include

percentage four-year necessary research work essential

problem success even higher-order goals



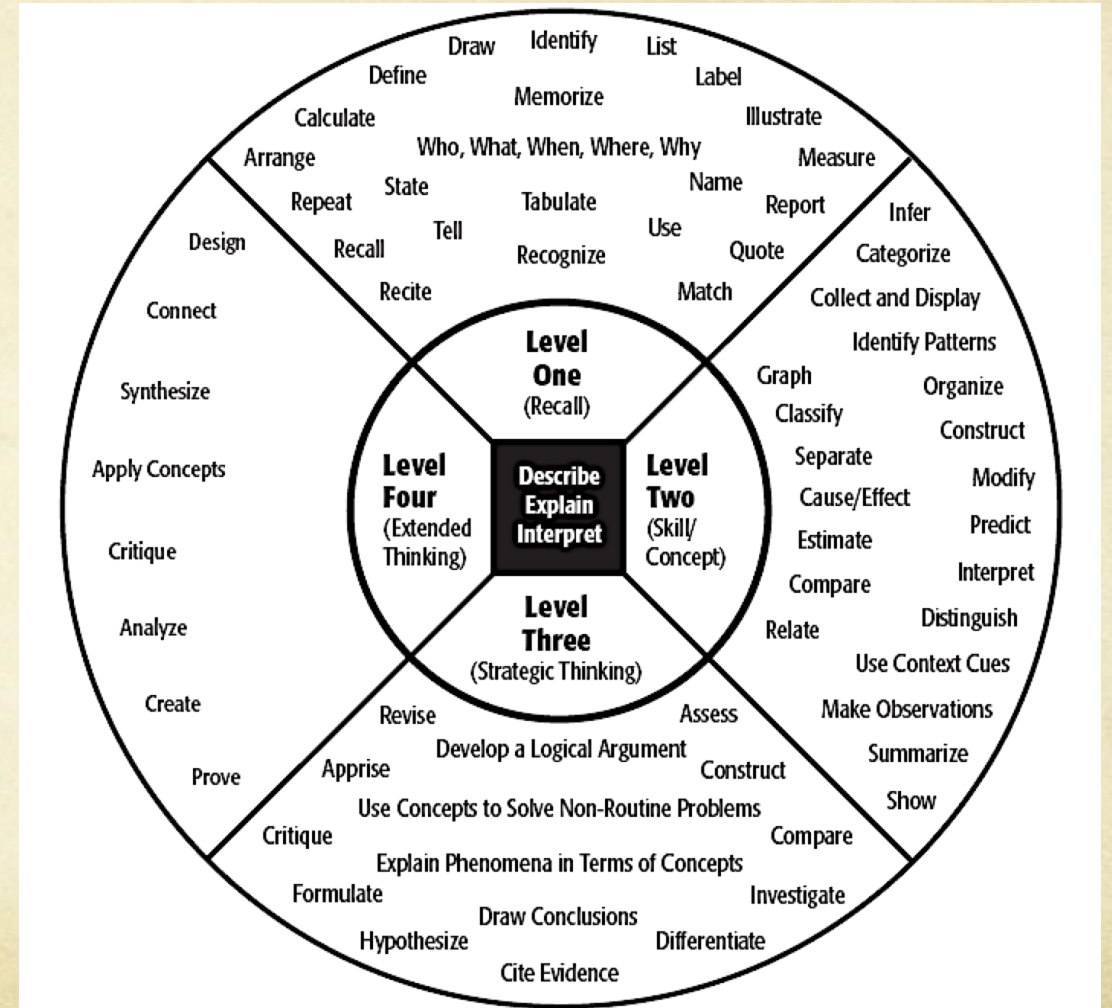
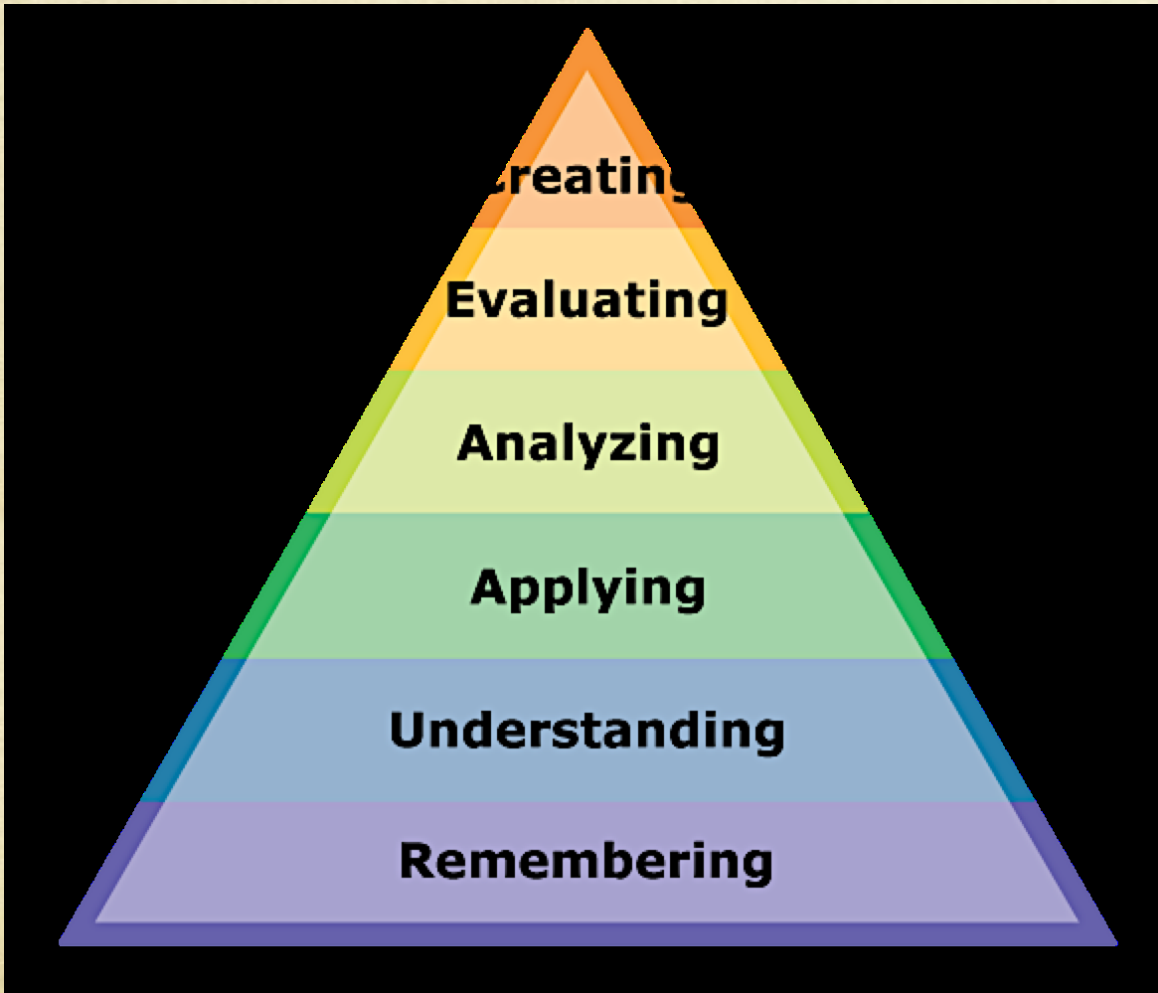


# Expectations for Educators

- Prepare ALL students to be ready for college & careers
- Assumes a mindset that ALL students can achieve
- Systematically increase expectations & rigor for students



# Blooms' & Webb's...





# I Remember.....

- 10% of what I read
- 20% of what I hear
- 30% of what I see
- 50% of what I see and hear
- 70% of what I discuss with others
- 80% of what I experience by doing
- 95% of what I teach others

***Experts in brain based learning claim that traditional instruction is at odds with how the brain learns and that a typical classroom environment actually inhibits the brain from learning!***



# Pedagogical Implications

*(What Will Teaching & Learning Look Like?)*







# Webb's Depth of Knowledge

## Level 1

### Routine Thinking

Recall or reproduce knowledge or skills

## Level 2

### Conceptual Thinking

Requires students process knowledge about skills or concepts before responding

## Level 3

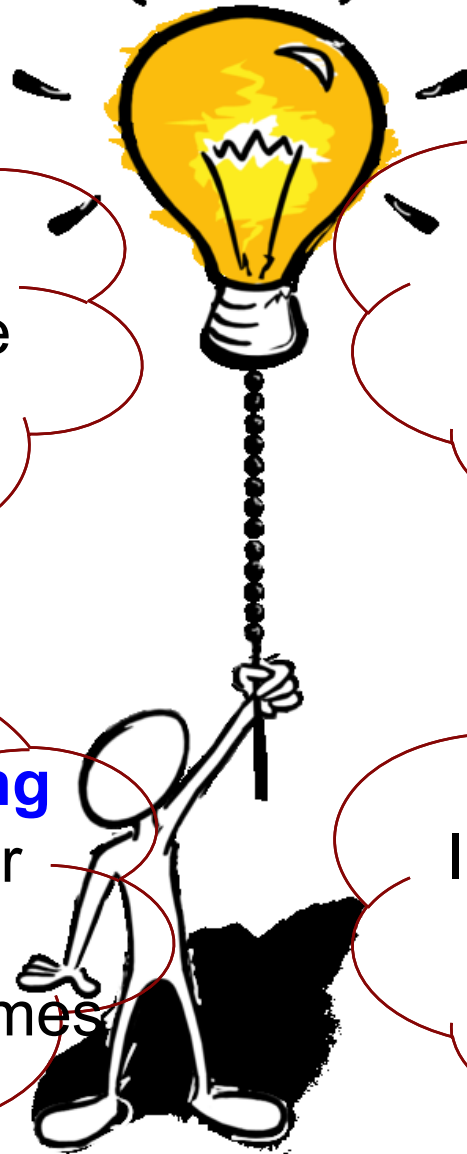
### Short-Term Strategic Thinking

Short-term use of higher order thinking to solve real world problems with predictable outcomes

## Level 4

### Extended Thinking

Investigate solutions to real world problems with unpredictable outcomes





# DOK – Level One Recall & Reproduction

## Knowledge Acquisition

WHO?

WHAT?

WHERE?

WHY?

HOW?

WHEN?

# DOK – Level One Knowledge Acquisition

## ❖ TEACHER ROLE



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## ❖ STUDENT ROLE

- Remembers
- Memorizes
- Restates
- Absorbs





# DOK – Level Two Skill & Concept

## **Knowledge Application**

How did it happen?

How does it work?

How is it used?

# DOK – Level Two

## Knowledge Application

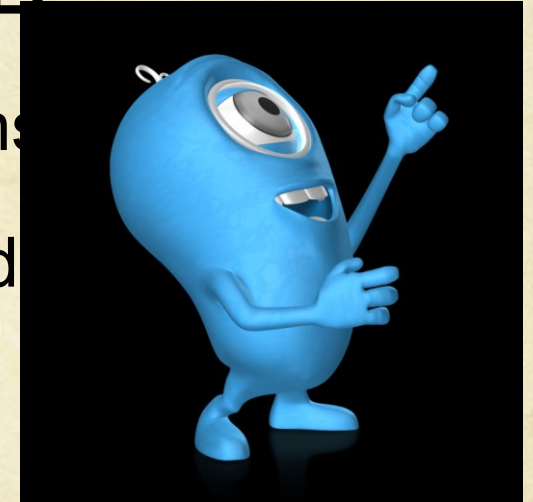


### TEACHER ROLE

• Provides questions to differentiate  
• Provides examples and  
• Provides connections  
• Provides examples and  
• Provides examples

### ❖ STUDENT ROLE

- Solves problems
- Constructs models
- Examines
- Compiles & organizes





# **DOK – Level Three**

## **Knowledge Analysis**

Why did it happen?

Why can you use it?

What is the effect?

How can you use it?

What is the cause?

What is the reason?

What is the result?

# DOK – Level Three

## Knowledge Analysis



### TEACHER ROLE

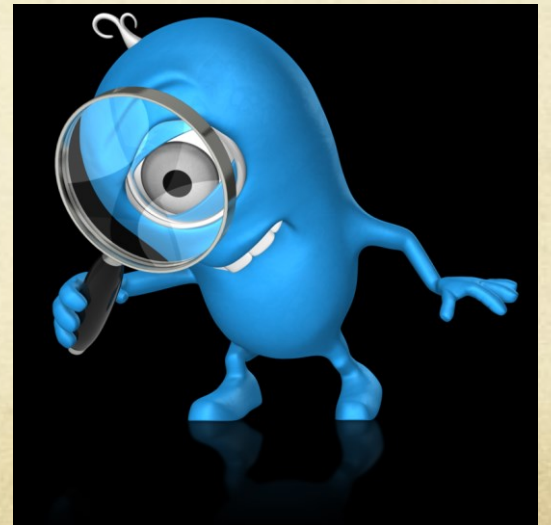
Asks open-ended questions

Acts as a resource

Encourages multiple approaches & solutions

### ❖ STUDENT ROLE

- Uncovers & selects relevant evidence for analysis
- Critiques
- Debates
- Argues





**DOK – Level Four  
Extended Thinking**

**Knowledge Augmentation and Transfer**

What if?

Why is the impact?

What is the influence?

What would happen?

Why is the relationship?

What do you believe/feel/think?

What can you create/design/develop?



# DOK – Level Four

## Knowledge Augmentation and Transfer



### TEACHER ROLE

• Asks questions to extend thinking

• Facilitates teaming, collaboration, & self-evaluation

### ❖ STUDENT ROLE

• Designs

• Takes risks

• Researches

• Creates tangible products



# Interpret the Standards

SS.ELA-LITERACY.RST.6-8.5

**DOK 4**

**Analyze** the structure an author uses to organize a text, including how the major sections contribute to the whole in order to an understanding of the topic.

SS.ELA-LITERACY.RST.6-8.8

**DOK 2**

**Distinguish** among facts, reasoned judgment based on research findings, and speculation in a text.

SS.ELA-LITERACY.RST.6-8.9

**DOK 3**

**Compare and contrast** the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic





# Interpret the Standards



## CSS.ELA-LITERACY.W.4.8

**Recall** relevant information from experiences or other relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

**DOK 1**

## CSS.ELA-LITERACY.W.4.9

**Draw** evidence from literary or informational texts to support analysis, reflection, and research.

**DOK 1**



# Backward Design



Identify  
Desired  
Results

Determine  
Acceptable  
Evidence

Plan  
Instruction  
& Activities



# Identify Desired Results



**Standard**

**Goal**

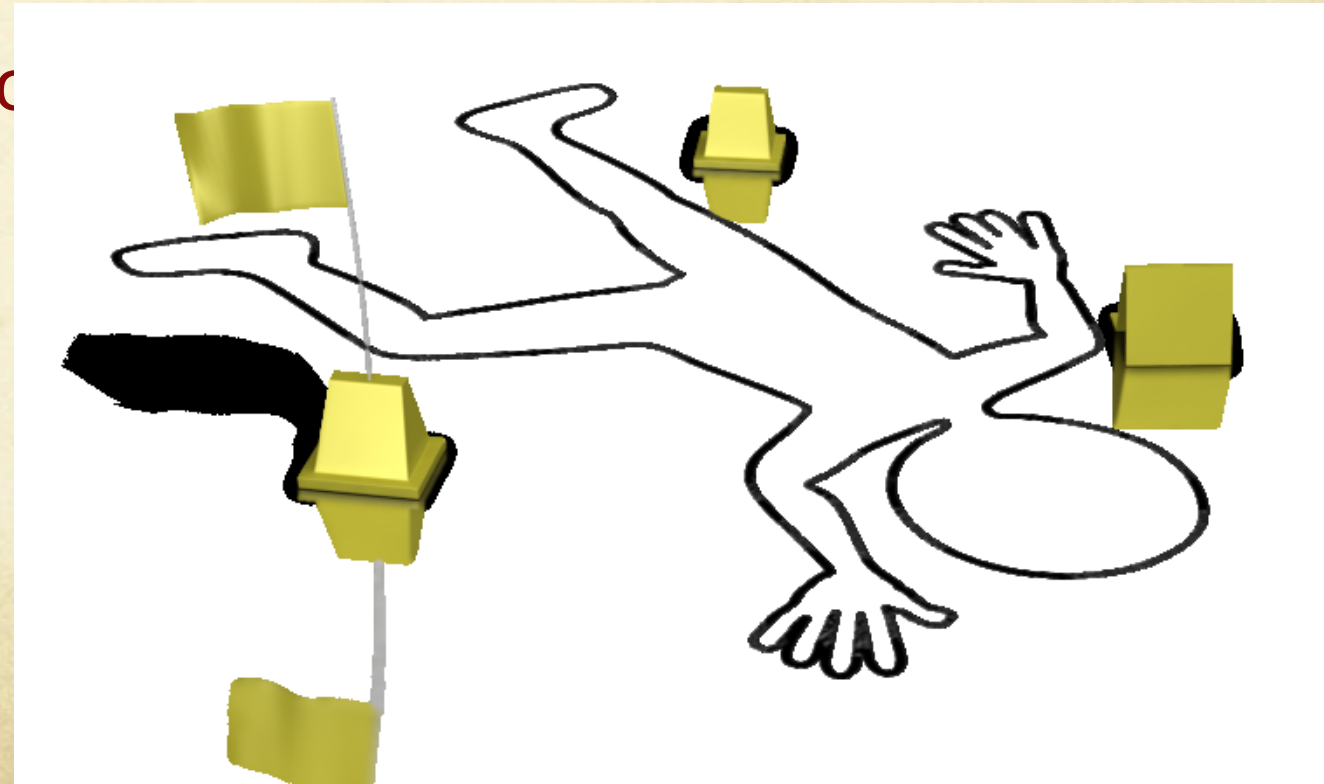
**Objective**

**Compare and contrast** the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic



# Determine Acceptable Evidence

- What will demonstrate that student learning took place?
- Formative and summative assessments
- Observations, tests, projects



# Plan Instruction & Learning Activities

- What knowledge & skills will students need to achieve desired learning outcomes?
- Formative and summative assessments
- Consider teaching methods, sequencing, materials







<b>Instructional Strategy Category</b>	<b>Predicted Percentile Gains</b>	<b>Actual Percentile Gains</b>
Generating & testing hypotheses		
Nonlinguistic representations		
Reinforcing effort and providing recognition		
Homework & practice		
Summarizing & note taking		
Identifying similarities and differences		
Cooperative Learning		
Questions, cues, & advanced organizers		
Setting objectives & providing feedback		



<b>Instructional Strategy Category</b>	<b>Predicted Percentile Gains</b>	<b>Actual Percentile Gains</b>
Generating & testing hypotheses		23
Nonlinguistic representations		27
Reinforcing effort and providing recognition		29
Homework & practice		28
Summarizing & note taking		34
Identifying similarities and differences		45
Cooperative Learning		27
Questions, cues, & advanced organizers		22
Setting objectives & providing feedback		23

# “Bump Up” the Thinking Level

- It's easy... Use your DOK Wheel
- By your level of questioning
- What you are asking the student to do
- “How do you know?”
- *A Guide for Using Webb's DOK with CCSS* (info on reference slide)



# Questions?

<http://tinyurl.com/NYARDOK>

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## Level 1

Requires students to use simple skills or abilities to recall or locate facts in the text.

DOK Levels for **R**



## Level 2

Requires both initial comprehension and subsequent processing of text or portions of text.

DOK Levels for **Reading**





## Level 3

Require

deep

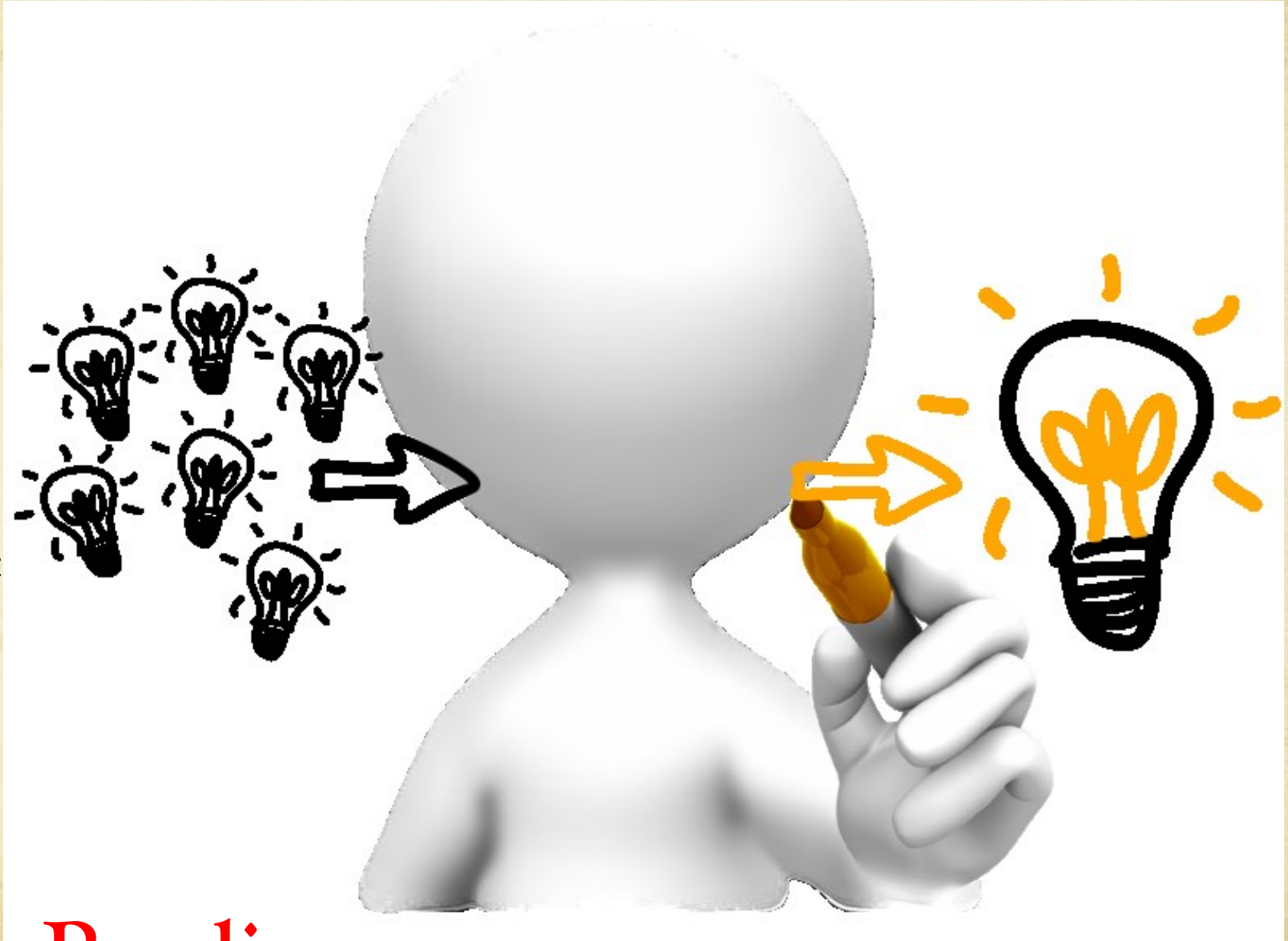
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DOK Levels for **Reading**

## Level 4

Requires complex reasoning, planning, developing, and thinking most like over an extended period of time



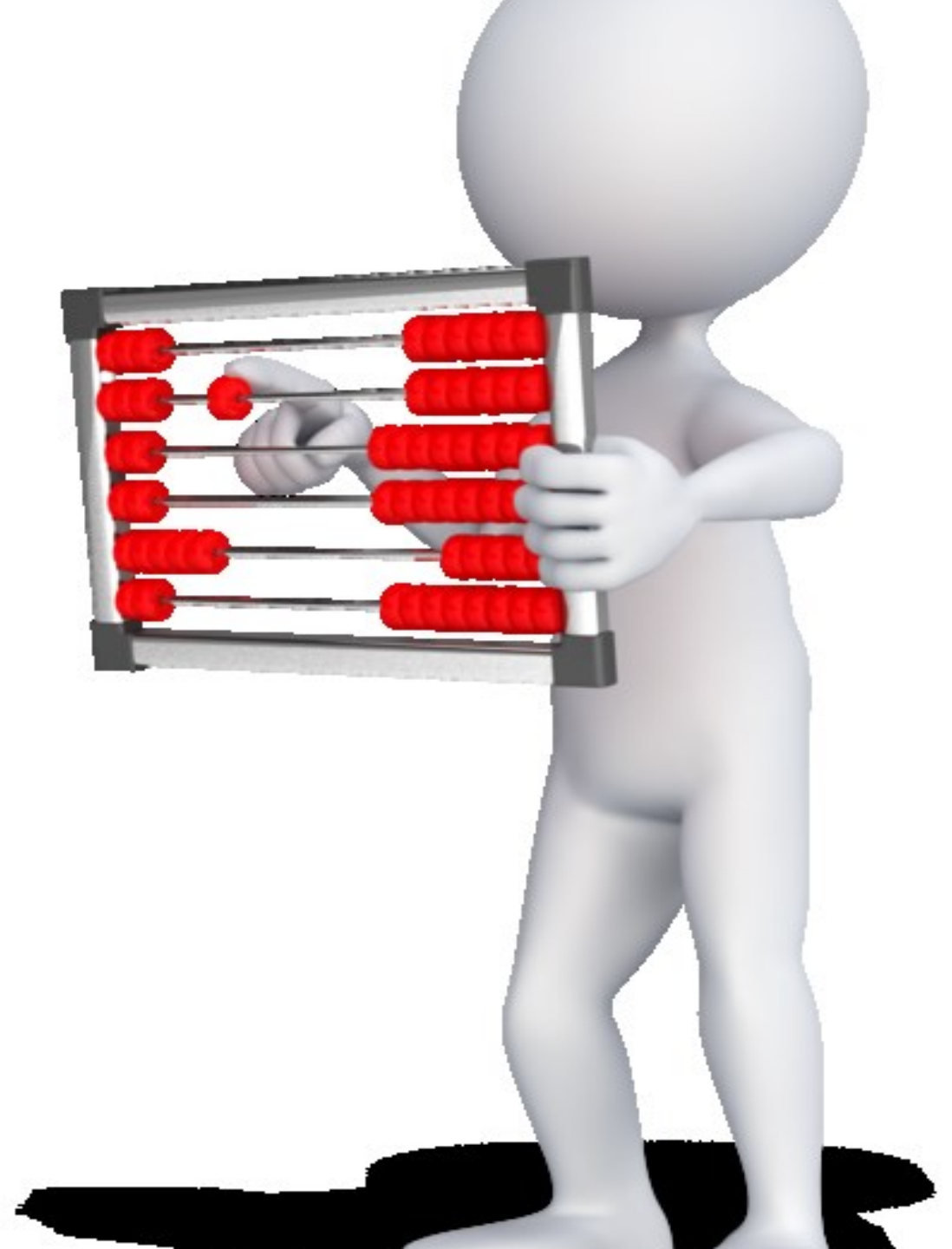
DOK Levels for **Reading**



## Level 1

Requires the recall of information (fact, definition, term, or property), the use of a procedure, or applying an algorithm or formula

DOK Levels for **Math**



## Level 2

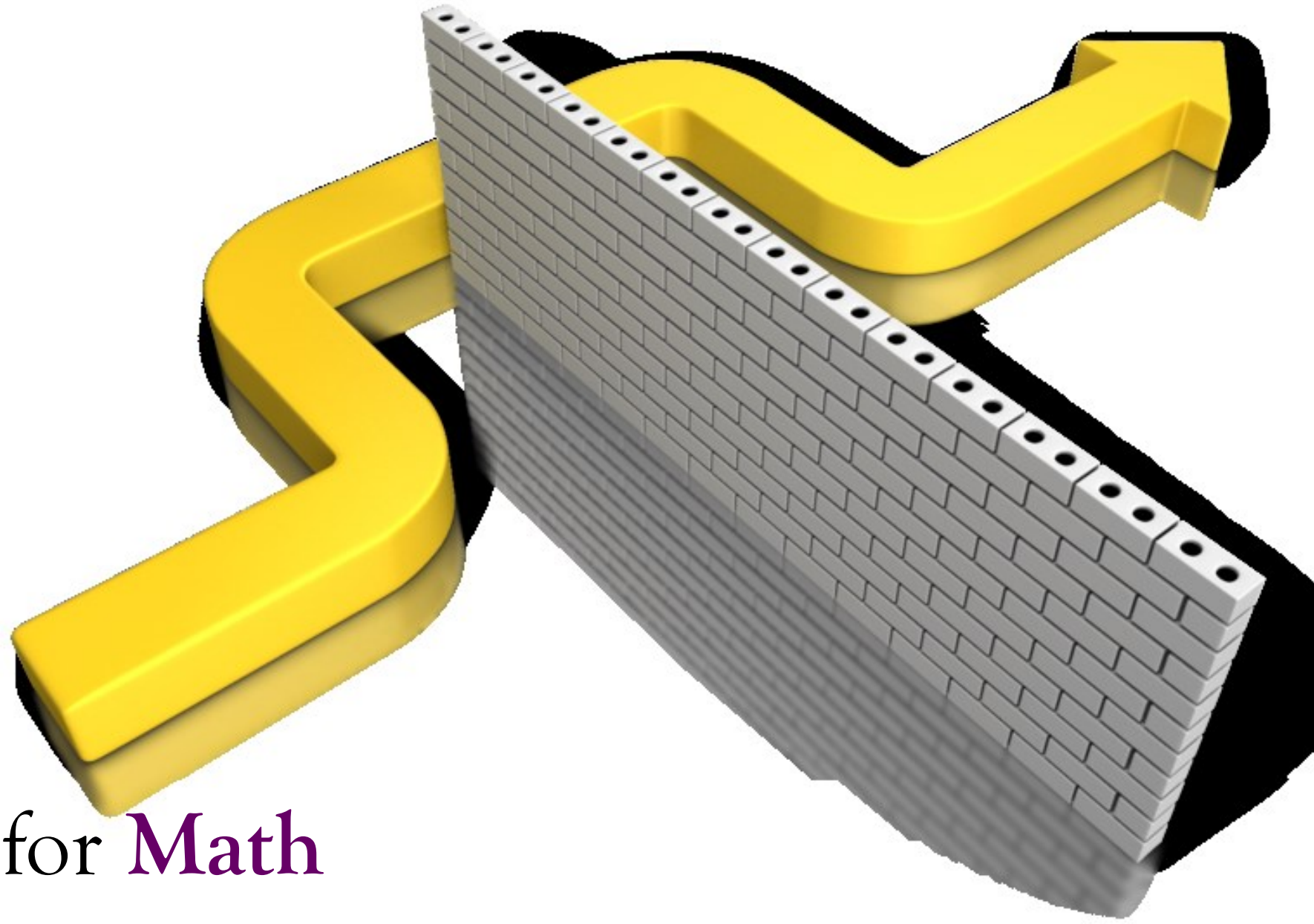
Requires demonstration of conceptual understanding through models and explanations, comparing and classifying information, estimating, and interpreting data from a simple graph.



DOK Levels for **Math**



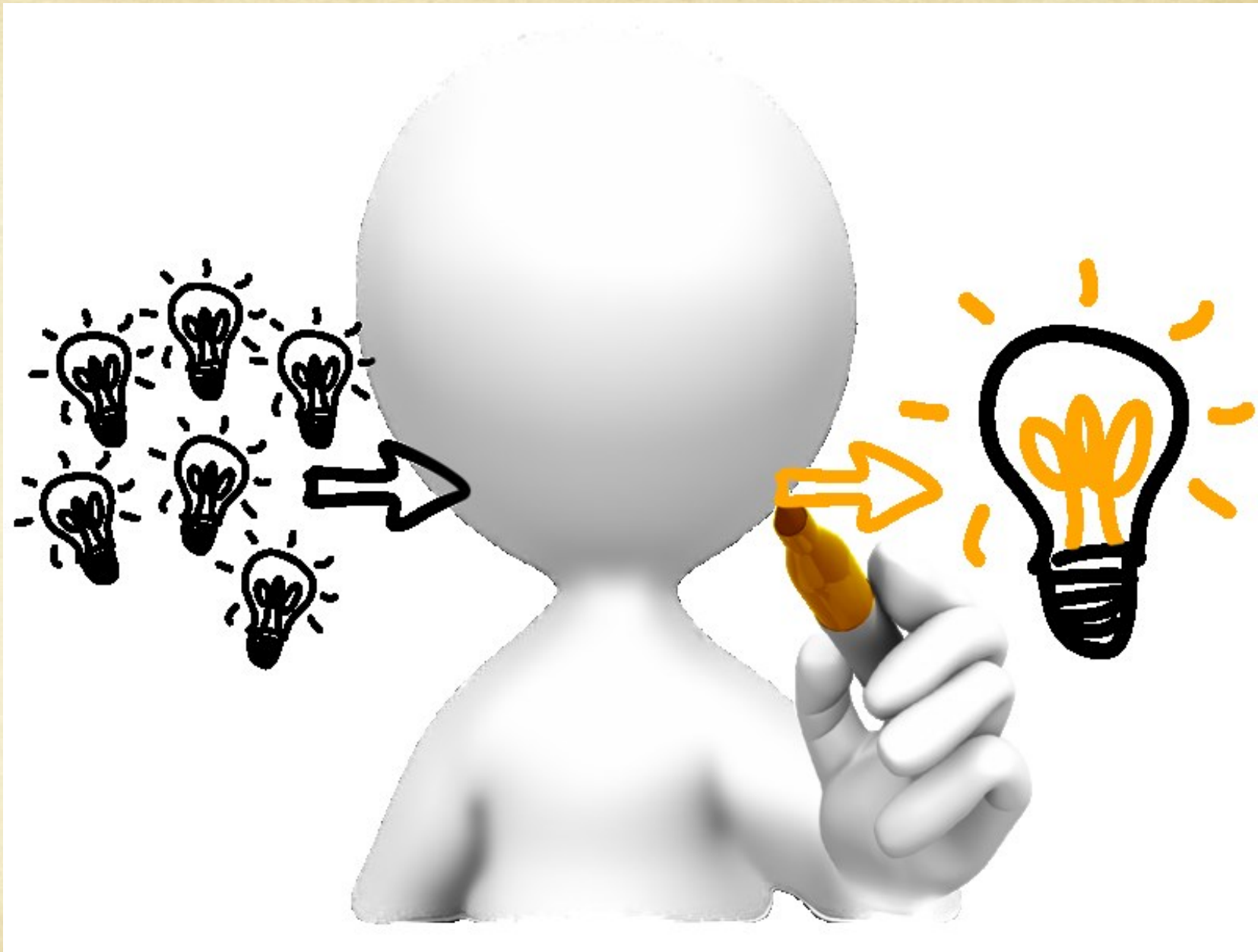
**Level 3** requires reasoning, planning and using evidence to solve a problem algorithm



DOK Levels for **Math**

## Level 4

Requires complex reasoning, planning, and thinking generally over extended periods of time (not time only on repetitive tasks)



DOK Levels for **Math**



# College & Career Readiness Anchor Standards - Reading



## Key Ideas and Details:

### CCSS.ELA-LITERACY.CCRA.R.1

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. *DOK 2*

### CCSS.ELA-LITERACY.CCRA.R.2

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. *DOK 2*

### CCSS.ELA-LITERACY.CCRA.R.3

Analyze how and why individuals, events, or ideas develop and interact over the course of a text. *DOK 4*

# College & Career Readiness Anchor Standards - Reading



## Craft and Structure:

### CCSS.ELA-LITERACY.CCRA.R.4

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. *DOK 3*

### CCSS.ELA-LITERACY.CCRA.R.5

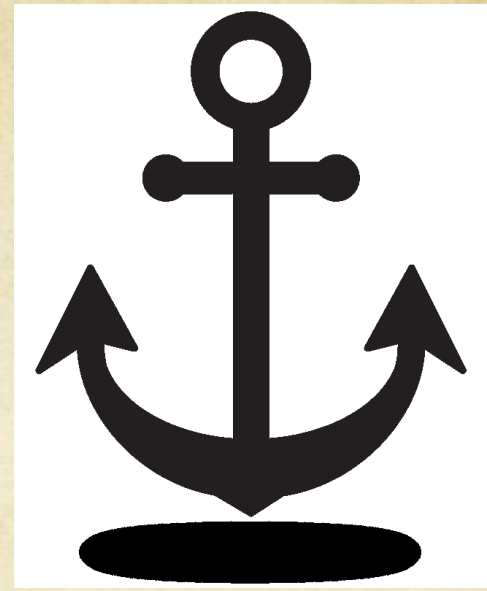
Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. *DOK 3*

### CCSS.ELA-LITERACY.CCRA.R.6

Assess how point of view or purpose shapes the content and style of a text. *DOK 3*



# College & Career Readiness Anchor Standards - Reading



## Integration of Knowledge and Ideas:

### CCSS.ELA-LITERACY.CCRA.R.7

Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. *DOK 4*

### CCSS.ELA-LITERACY.CCRA.R.8

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. *DOK 4*

### CCSS.ELA-LITERACY.CCRA.R.9

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. *DOK 3*

# College & Career Readiness Anchor Standards - **Reading**



Range of Reading and Level of Text Complexity:

[CCSS.ELA-LITERACY.CCRA.R.10](#)

Read and comprehend complex literary and informational texts independently and proficiently *DOK 2*



# Standards of Mathematical Practice

CCSS.MATH.PRACTICE.MP1 Make sense of problems and persevere in solving them. *DOK 3*

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary.

# Standards of Mathematical Practice

CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively. *DOK 3*

Mathematically proficient students make sense of quantities and their relationships in problem situations.



# Standards of Mathematical Practice

CCSS.MATH.PRACTICE.MP3 Construct viable arguments and critique the reasoning of others. *DOK 4*

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is.

# Standards of Mathematical Practice

CCSS.MATH.PRACTICE.MP4 Model with mathematics. *DOK 3*

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.



# Standards of Mathematical Practice



CCSS.MATH.PRACTICE.MP5 Use appropriate tools strategically. *DOK 3*

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations.



# Standards of Mathematical Practice



CCSS.MATH.PRACTICE.MP6 Attend to precision. *DOK 2*

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately.



# Standards of Mathematical Practice



CCSS.MATH.PRACTICE.MP7 Look for and make use of structure. *DOK 3*

Mathematically proficient students look closely to discern a pattern or structure.

# Standards of Mathematical Practice



CCSS.MATH.PRACTICE.MP8 Look for and express regularity in repeated reasoning. *DOK 2*

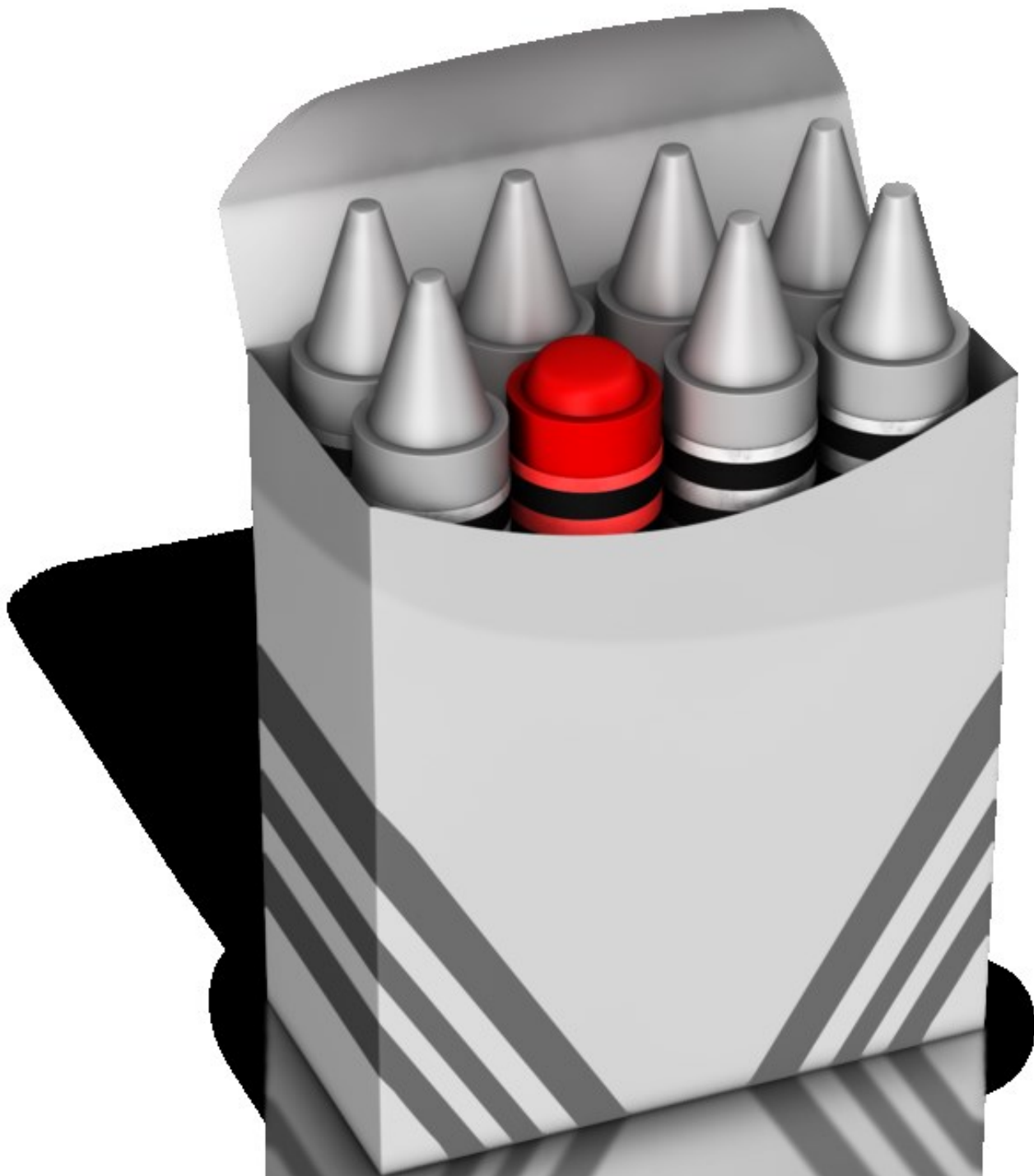
Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. They continually evaluate the reasonableness of their intermediate results.



# Math



- ☐ Think of a recent literacy or math activity.
- ☐ Look at the standard(s) and determine if the activity aligns with the standard.
- ☐ Yes - How could you bump up the thinking level?
- ☐ No - How could you change the activity to align with the standard?



# Students At Risk

## Reluctant Learners

- Worn down
- Worn out
- Don't feel smart
- Don't want to stand out
- Defeated
- Sad
- Mad
- **They NEED YOU!**



# Questions?

<http://tinyurl.com/NYARDOK>

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