Rigor and Relevance for Student Achievement
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Say What?
PURPOSE

Establish a Sense of Urgency for a Culture of High Expectations and System-wide Rigor and Relevance.
Working Agreements

• Choose to be present.
  – Bring your “best self” to the work. Model behavior to inspire others.

• Be an active listener.
  – Assume positive intent.

• Be part of the discussion.
  – We diminish the whole group when we silence ourselves.

• Understand that learning is a process—not an event.
Change
Did You Know?
What are the global issues we face today?
4-2-1

- Step 1-Write down what you believe to be the most serious global issue we face today.
- Step 2-With a partner, come to consensus on one.
- Step 3-With another pair, agree on the most important.
Who Are the Students We Teach?

- Digital Natives
- Live in Global World
- Parents & Students have new choices
  - On-line learning
# Learning Preferences of the Digital Generation

<table>
<thead>
<tr>
<th>DIGITAL LEARNERS PREFER</th>
<th>MANY EDUCATORS PREFER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving information quickly from multiple multimedia sources</td>
<td>Slow and controlled release of information from limited sources</td>
</tr>
<tr>
<td>Processing pictures, sounds, color and video before text</td>
<td>To provide text before pictures, sounds, color, and video</td>
</tr>
<tr>
<td>Random access to hyperlinked multimedia information</td>
<td>To provide information linearly, logically, and sequentially</td>
</tr>
<tr>
<td>To network simultaneously with many others</td>
<td>Students to work independently before they network and interact</td>
</tr>
<tr>
<td>Learning “just in time”</td>
<td>Teaching “just in case”</td>
</tr>
<tr>
<td>Instant gratification with immediate and deferred rewards</td>
<td>Deferred gratification and delayed rewards</td>
</tr>
<tr>
<td>Learning that is relevant, active, instantly useful, and fun</td>
<td>Teaching memorization in preparation for standardized tests</td>
</tr>
</tbody>
</table>
Analyzing and Connecting the CCSS
Organize the statements

• Each envelope contains 24 statements.

• Remove the contents of the envelopes and work together to organize the items in any way that makes sense to your groups.

• Once your items are arranged, designate a recorder to write a rationale for your organization on the blank index card.
Gallery walk

• Each group will visit 3 tables.

• You have 3 minutes to look at the organization of items and to discuss how the group’s rational aligned (or did not align) with your group’s rationale.
Process

• Revisit your original organization of the items and discuss any changes to your thinking.
### Reading Standards

| Analyze how and why individuals, events, and ideas develop and interact over the course of a text. | 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. | Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. | Read and comprehend complex literary and informational texts independently and proficiently. |

### Writing Standards

| Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. | Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. | Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. | Draw evidence from literary or informational texts to support analysis, reflection, and research. |
## Speaking and Listening Standards

<table>
<thead>
<tr>
<th>Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.</th>
<th>Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.</th>
<th>Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric.</th>
<th>Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.</th>
</tr>
</thead>
</table>

## Language Standards

<p>| Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. | Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate. | Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. | Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. |</p>
<table>
<thead>
<tr>
<th>Mathematical Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make sense of problems and persevere in solving them.</td>
</tr>
<tr>
<td>Reason abstractly and quantitatively.</td>
</tr>
<tr>
<td>Construct viable arguments and critique the reasoning of others.</td>
</tr>
<tr>
<td>Model with mathematics.</td>
</tr>
<tr>
<td>Use appropriate tools strategically.</td>
</tr>
<tr>
<td>Attend to precision.</td>
</tr>
<tr>
<td>Look for and make use of structure.</td>
</tr>
<tr>
<td>Look for and express regularity in repeated reasoning.</td>
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</tbody>
</table>
2014-2015

Next Generation Assessments
Gas Bills, Heating Degree Days, and Energy Efficiency

Here is a typical story about an Ohio family concerned with saving money and energy by better insulating their house.

Kevin and Shana Johnson’s mother was surprised by some very high gas heating bills during the winter months of 2007. To improve the energy efficiency of her house, Ms. Johnson found a contractor who installed new insulation and sealed some of her windows. He charged her $600 for this work and told her he was pretty sure that her gas bills would go down by “at least 10 percent each year.” Since she had spent nearly $1,500 to keep her house warm the previous winter, she expected her investment would conserve enough energy to save at least $150 each winter (10% of $1,500) on her gas bills.

Ms. Johnson’s gas bill in January 2007 was $240. When she got the bill for January 2008, she was stunned that the new bill was $235. If the new insulation was going to save only $5 each month, it was going to take a very long time to earn back the $600 she had spent. So she called the insulation contractor to see if he had an explanation for what might have gone wrong. The contractor pointed out that the month of January had been very cold this year and that the rates had gone up from last year. He said her bill was probably at least 10% less than it would have been without the new insulation and window sealing.

Ms. Johnson compared her January bill from 2008 to her January bill from 2007. She found out that she had used 200 units of heat in January of 2007 and was charged $1.20 per unit (total = $240). In 2008, she had used 188 units of heat but was charged $1.25 per unit (total = $235) because gas prices were higher in 2008. She found out the average temperature in Ohio in January 2007 had been 32.9 degrees, and in January of 2008, the average temperature was more than 4 degrees colder, 28.7 degrees. Ms. Johnson realized she was doing well to have used less energy (188 units versus 200 units), especially in a month when it had been colder than the previous year.

Since she used gas for heating only, Ms. Johnson wanted a better estimate of the savings due to the additional insulation and window sealing. She asked Kevin and Shana to look into whether the “heating degree days” listed on the bill might provide some insight.

(continued)
a. Assess the cost-effectiveness of Ms. Johnson’s new insulation and window sealing. You will need to research on “heating degree days” on the internet. In your response, you must do the following:

- Explain Ms. Johnson’s savings after the insulation and sealing.
- Identify circumstances under which Ms. Johnson’s January 2008 gas bill would have been at least 10% less than her January 2007 bill.
- Decide if the insulation and sealing work on Ms. Johnson’s house was cost-effective and provide evidence for this decision.

Enter response here

Submit
b. Create a short pamphlet for gas company customers to guide them in making decisions about increasing the energy efficiency of their homes. The pamphlet must do the following:

- List the quantities that customers need to consider in assessing the cost-effectiveness of energy efficiency measures.
- Generalize the method of comparison used for Ms. Johnson’s gas bills with a set of formulas, and provide an explanation of the formulas.
- Explain to gas customers how to weigh the cost of energy efficiency measures with savings on their gas bills.

When you have completed your pamphlet, upload it using the button below.

Select a file... Submit

Performance Event drawn from the Ohio Performance Assessment Project.
Common Core State Standards

- Fewer
- Higher
- Deeper
- The students will be expected to THINK and apply their knowledge
- Computerized
- Next Generation of Testing, 2014-15
Why Change?

• Career and College Ready
• 21st Century Skills
• Technology
• Foundational Knowledge
• Pursuit of Excellence
• Maximize Potential
Checking in:

• **View Singapore School**
• Write down 4 - 6 key words that stand out to you, and the reasons you chose them
• Each person at your table share your list with your table team
QuickTime™ and a decompressor are needed to see this picture.
After Viewing:

• Share your list of 4-6 key words with your table and the reasons you chose them.
“We’re teaching kids to live on a planet we’ve never seen.”

—Mary Catherine Bateson
Rigor and Relevance
• What do you think of when you hear the phrase, “hole in the wall”?

Why Relevance?
QuickTime™ and a decompressor are needed to see this picture.
• After viewing the clip, has your view of the phrase “hole in the wall” changed? How? Why?

• How does this clip connect the importance of relevance?
Relevance can hook us, can keep us working through struggles, comfort us, and spark original ideas.
To add Relevance to a Lesson or Unit...

- Student’s life
- Family’s life
- Student’s community and friends
- Our world, nation, state
- World of Work
- World of Service
- World of Business and Commerce that we interact with
- Our natural world

Use the Real World

- Moral, ethical, political, cultural points of view, and dilemmas
- Real world materials
- Internet resources
- Video and other media
- Scenarios, real life stories
- News - periodicals, media
Rigor
Rigor...
Increases preparedness for the future, creativity and constructive struggle.
Why Rigor?

It reflects what is needed in the 21st Century
It engages us & reflects how our brains naturally work
Why Rigor?

It reflects what is needed for success in school
serotonin & dopamine pathways
Rigor is...

- Scaffolding thinking
- Planning for thinking
- Assessing thinking about content
- Recognizing the level of thinking students demonstrate
- Managing the teaching/learning level for the desired thinking level

Rigor is NOT...

- More or harder worksheets
- AP or honors courses
- The higher level book in reading
- More work
- More homework
RIGOR MEANS FRAMING LESSONS AT THE HIGH END OF THE KNOWLEDGE TAXONOMY

EVALUATION
SYNTHESIS
ANALYSIS
APPLICATION
COMPREHENSION
KNOWLEDGE
Rigorous Lessons ask Students to:

- EXAMINE
- PRODUCE
- CLASSIFY
- DEDUCE
- GENERATE
- ASSESS
- CREATE
- PRIORITIZE
- SCRUTINIZE
- DECIDE
Ways to increase Rigor

1. QUESTIONS!!!
2. Making thinking visible
3. Sharing clear examples
4. Writing and thinking as a measure of thinking
5. Create challenging problems for them to solve
IN MY CLASS

• Provide an example of a rigorous activity you facilitate.

• Share with a partner.
Rigor and Relevance Framework
Application Model

1. Knowledge in one discipline
2. Application within discipline
3. Application across disciplines
4. Application to real-world predictable situations
5. Application to real-world unpredictable situations
Application Model

1. Knowledge of one discipline course
2. Application within discipline
3. Application across disciplines
4. Application to real-world predictable situations
5. Application to real-world unpredictable situations
Rigor/Relevance Framework

- Assimilation (C)
- Application (B)
- Adaptation (D)
- Application Model

Knowledge Taxonomy:
- Knowledge in one discipline
- Apply in discipline
- Apply across disciplines
- Apply to real-world predictable situations
- Apply to real-world unpredictable situations

International Center for Leadership in Education
Knowledge Taxonomy

1. Recall Knowledge
2. Comprehension
3. Application
4. Analysis
5. Synthesis
6. Evaluation
Old Bloom Taxonomy VS. New Blooms Taxonomy
Gathering and storing bits of information in order to understand and remember

Example: Recall definitions of various science terms.

lower levels of application
Quad B question

Where or how can you use this knowledge?

lower levels of thinking

Using knowledge to solve problems and complete work.

Application

B

Example: Follow written directions to conduct an experiment

higher levels of application
Quad C question

How are those ideas similar and different?

Using high levels of knowledge to analyze problems and create solutions

Assimilation

Example: Analyze data to prove or disprove a theory

high levels of thinking

lower levels of application
Thinking in complex ways and applying thinking to find solutions to unpredictable problems

**Adaptation**

**Quad D question**

How might you design a ______ to _______?

**Example:** Design your own experiment to collect data to solve a real-world problem

**high levels of thinking**

**high levels of application**
Rigor/Relevance Framework

Math Middle Level - Geometry: Identify rotational symmetry and distinguish between types of symmetry

- **High / High**
  - **C**: Create an animation using Flash that shows symmetry
  - **D**: Modify algebraic expressions to create symmetry when graphed.

- **High / Low**
  - **A**: Find shapes/things around you that have symmetry
  - **B**: Given a set of shapes, identify symmetries

**International Center for Leadership in Education**
Rigor/Relevance Framework

Math Middle Level - Geometry: Identify rotational symmetry and distinguish between types of symmetry

<table>
<thead>
<tr>
<th>Rigor</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Modify algebraic expressions to create symmetry when graphed.</td>
</tr>
<tr>
<td>Low</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Create an animation using Flash that shows symmetry</td>
</tr>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Given a set of shapes, identify symmetries</td>
</tr>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Find shapes/things around you that have symmetry</td>
</tr>
</tbody>
</table>
Rigor/Relevance Framework

Science – Cell Biology

High

C  Argue your position on how stem cell research will impact plant and animal cell development.

D  Compare and contrast plant and animal cells

Low

A  Using microscope, illustrate cell you are observing and label parts.

B  Label parts of a cell
<table>
<thead>
<tr>
<th>Rigor/Relevance Framework</th>
<th>Science – Cell Biology</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Compare and contrast plant and animal cells</td>
</tr>
<tr>
<td>D</td>
<td>Argue your position on how stem cell research will impact plant and animal cell development.</td>
</tr>
<tr>
<td>A</td>
<td>Label parts of a cell</td>
</tr>
<tr>
<td>B</td>
<td>Using microscope, illustrate cell you are observing and label parts.</td>
</tr>
</tbody>
</table>

**Comparison Activity**

- **High Rigor, High Relevance**
  - Argue your position on how stem cell research will impact plant and animal cell development.

- **High Rigor, Low Relevance**
  - Label parts of a cell

- **Low Rigor, High Relevance**
  - Using microscope, illustrate cell you are observing and label parts.

- **Low Rigor, Low Relevance**
  - Compare and contrast plant and animal cells
Rigor/Relevance Framework

- **Rigor**
  - Critical Thinking
  - Acquisition of knowledge / skills

- **Relevance**
  - Motivation
  - Creativity – Innovation
  - Problem Solving
  - Relevancy
  - Validation

**Quadrants:**

- **A** (Low Rigor, Low Relevance): Acquisition of knowledge / skills
- **B** (Low Rigor, High Relevance): Validation
- **C** (High Rigor, Low Relevance): Critical Thinking
- **D** (High Rigor, High Relevance): Motivation, Creativity – Innovation, Problem Solving

**Axes:**

- Rigor: High (C) to Low (A)
- Relevance: Low (A) to High (D)
# Rigor / Relevance Framework™

## Knowledge Taxonomy

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Analysis</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge 1</td>
<td>“Information Gathering”</td>
<td>“Judge the Outcome”</td>
</tr>
<tr>
<td>2</td>
<td>Comprehension</td>
<td>“Confirming”</td>
<td>Synthesis</td>
</tr>
<tr>
<td>3</td>
<td>Application 3</td>
<td>“Making use of Knowledge”</td>
<td>“Putting Together”</td>
</tr>
<tr>
<td>4</td>
<td>Analysis 4</td>
<td>“Taking Apart”</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Evaluation 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Relevance: Makes Rigor Happen!

- **1** Knowledge in one Discipline
- **2** Apply Knowledge in one discipline
- **3** Apply Knowledge across disciplines
- **4** Apply knowledge to real world predictable situations
- **5** Apply knowledge to real world unpredictable situations

## Rigor / Relevance Framework

### A: Acquisition

**Students gather and store bits of knowledge and information and are expected to remember or understand this acquired knowledge.**

- **Teacher Works** (Relationship of little Importance)

### B: Application

**Students use acquired knowledge to solve problems, design solutions, and complete work. The highest level of application is to apply appropriate knowledge to new and unpredictable situations.**

- **Student Works** (Relationships Important)

### C: Assimilation

**Students extend and refine their knowledge so that they can use it automatically and routinely to analyze and solve problems and create solutions.**

- **Student Thinks** (Relationships Important)

### D: Adaptation

**Students have the competence that, when confronted with perplexing unknowns, they are able to use their extensive knowledge base and skills to create unique solutions and take action that further develops their skills and knowledge.**

- **Student Thinks and Works** (Relationships Critical)
Rigor/Relevance Framework Quiz

Which Quadrant is labeled as High Rigor and High Relevance?

A  B  C  D
Which Quadrant is most frequently tested?
Rigor/Relevance Framework Quiz

Which Quadrant leads to greater student engagement and learning retention?

A
B
C
D

International Center for Leadership in Education
Which defines Rigor?

A. More and longer assignments
B. High level thinking and reflection
C. Rigid deadlines
D. Increased difficulty
Rigor/Relevance Framework Quiz

Which defines Relevance?

A. Learning is fun
B. Student choice
C. No grades
D. Application to the real world
Rigor/Relevance Framework Quiz

Which Quadrant is most important?
Increasing the Level of Rigor and Relevance
Verbs by Quadrant

Knowledge Taxonomy:
- Analyze, categorize, classify, compare, conclude, contrast, debate, defend, diagnose, differentiate, discriminate
- Calculate, choose, count, define, describe, find, identify, label, list, locate, match
- Memorize, name, point to, recall, recite, record, say, select, spell, view
- Adjust, apply, build, collect, construct, demonstrate, display, dramatize, draw, fix, follow, illustrate, interpret, interview, look up, maintain, make, measure, model, operate, practice, solve

Application Model:
- Analyze, examine, explain, express, generate, infer, judge, justify, prove, research, study, summarize
- Adapt, compose, conclude, create, design, develop, discover, explore, formulate, invent, modify, plan
- Predict, prioritize, propose, rate, recommend, revise, teach

p. 5 Using R/R Handbook
<table>
<thead>
<tr>
<th>Quadrant A</th>
<th>Quadrant B</th>
<th>Quadrant C</th>
<th>Quadrant D</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>apply</td>
<td>analyze</td>
<td>evaluate</td>
</tr>
<tr>
<td>label</td>
<td>sequence</td>
<td>compare</td>
<td>formulate</td>
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<tr>
<td>define</td>
<td>demonstrat</td>
<td>examine</td>
<td>justify</td>
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<tr>
<td>select</td>
<td>interview</td>
<td>contrast</td>
<td>rate</td>
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<td>identify</td>
<td>construct</td>
<td>differentiate</td>
<td>recommend</td>
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<td>list</td>
<td>solve</td>
<td>explain</td>
<td>infer</td>
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<tr>
<td>recite</td>
<td>calculate</td>
<td>dissect</td>
<td>prioritize</td>
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<tr>
<td>locate</td>
<td>dramatize</td>
<td>categorize</td>
<td>Revise</td>
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<tr>
<td>record</td>
<td>interpret</td>
<td>classify</td>
<td>predict</td>
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<tr>
<td>memorize</td>
<td>illustrate</td>
<td>diagram</td>
<td>argue</td>
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<td></td>
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<td>discriminate</td>
<td>conclude</td>
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<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
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<tr>
<td>definition</td>
<td>scrapbook</td>
<td>essay</td>
<td>evaluation</td>
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<td>worksheet</td>
<td>summary</td>
<td>abstract</td>
<td>newspaper</td>
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<td>list</td>
<td>interpretation</td>
<td>blueprint</td>
<td>estimation</td>
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<td>inventory</td>
<td>trial</td>
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<td>annotation</td>
<td>report</td>
<td>editorial</td>
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<td>workbook</td>
<td>explanation</td>
<td>plan</td>
<td>play</td>
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<td>true-false</td>
<td>solution</td>
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<td>outline</td>
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<td>new game</td>
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<td></td>
<td></td>
<td></td>
<td>invention</td>
</tr>
</tbody>
</table>
Students think in complex ways and apply acquired knowledge and skills, even when confronted with perplexing unknowns, to find creative solutions and take action that further develops their skills and knowledge.
### Verbs
- evaluate
- validate
- justify
- rate
- referee
- infer
- rank
- dramatize
- argue
- conclude

### Products
- evaluation
- newspaper
- estimation
- trial
- editorial
- radio program
- play
- collage
- machine
- adaptation
- poem
- debate
- new game
- invention
How to Start a Movement
System-Wide???