This is What You’re Looking For: A Crash Course in the New Math Standards for Administrators Evaluating Teachers

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GOALS FOR THIS SESSION

• Engage in mathematics

• Understand the connection between the Standards for Mathematical Practice and student success

• Learn how to evaluate teachers through students

• Leave with tools to share with colleagues
Isabel lives $\frac{3}{4}$ mile from school. Janet lives $\frac{2}{3}$ mile from school.

How much farther, in miles, does Isabel live from school than Janet?

A $\frac{1}{4}$

B $\frac{1}{3}$

C $\frac{1}{7}$

D $\frac{1}{12}$
<table>
<thead>
<tr>
<th>Communicating Reasoning</th>
<th>Tasks assessing expressing mathematical reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrating ability to support mathematical conclusions</td>
<td>Each task calls for written arguments/justification, critique of reasoning, or precision in mathematical statements (SMP 3, 6).</td>
</tr>
</tbody>
</table>

The student demonstrates the thorough ability to clearly and precisely construct viable arguments to support the student's own reasoning and to critique the reasoning of others.
## A CASE FOR CHANGE

### Communicating Reasoning: Demonstrating ability to support mathematical conclusions:

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<th>5&lt;sup&gt;th&lt;/sup&gt;</th>
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<th>7&lt;sup&gt;th&lt;/sup&gt;</th>
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<th>11&lt;sup&gt;th&lt;/sup&gt;</th>
<th>ALL</th>
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<tbody>
<tr>
<td>Above Standard</td>
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<td>At or Near Standard</td>
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<td>Below Standard</td>
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</table>
Len walks $\frac{3}{10}$ mile in the morning to school. He walks $\frac{2}{5}$ mile in the afternoon to a friend’s house.

Len says that he walks a total of $\frac{5}{15}$ mile in the morning and afternoon.

Which **two** statements are true?

- Since $\frac{3}{10}$ plus $\frac{2}{5}$ is $\frac{5}{15}$, the total of $\frac{5}{15}$ is reasonable.

- Since $\frac{5}{15}$ is less than $\frac{2}{5}$, the total of $\frac{5}{15}$ is not reasonable.

- The fractions $\frac{5}{15}$, $\frac{3}{10}$, and $\frac{2}{5}$ are all less than $\frac{1}{2}$, so the total of $\frac{5}{15}$ is reasonable.

- The fraction $\frac{5}{15}$ is $\frac{1}{3}$, and $\frac{1}{3}$ is greater than $\frac{3}{10}$. Since $\frac{5}{15}$ is greater than one of the addends, the total of $\frac{5}{15}$ is reasonable.

- The fractions $\frac{3}{10}$ and $\frac{2}{5}$ are each greater than $\frac{1}{4}$, so the total must be greater than $\frac{1}{2}$. The fraction $\frac{5}{15}$ is less than $\frac{1}{2}$, so the total of $\frac{5}{15}$ is not reasonable.
## STANDARDS FOR MATHEMATICAL PRACTICE

<table>
<thead>
<tr>
<th></th>
<th>(I) = Initial</th>
<th>(N) = Intermediate</th>
<th>(A) = Advanced</th>
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</thead>
<tbody>
<tr>
<td>3a</td>
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<td></td>
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<tr>
<td>3b</td>
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<tr>
<td>6</td>
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</table>

The sum has to be larger than both of the addends. Just like with whole numbers.

\[ \frac{3}{10} + \frac{2}{5} \]

I agree with you sort of. I don’t think it’s because they are like whole numbers. I think it’s because when you combine two quantities you have more. Except with negative numbers.
“In order for those Mathematical Practices to become a reality, we need to know what they look like. Principals and other school leaders should have an understanding of ‘these practices’ too. They should know what to like, know what to look for. That expresses the value of what is important.”

http://math.serpmedia.org/5x8card/
<table>
<thead>
<tr>
<th>Student Vital Actions</th>
<th>Principles</th>
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</thead>
<tbody>
<tr>
<td>All students participate (e.g., boys and girls, ELL and special needs students), not just the hand-raisers.</td>
<td>Equity requires participation.</td>
</tr>
<tr>
<td>Students <strong>say a second sentence</strong> (spontaneously or prompted by the teacher or another student) to extend and explain their thinking.</td>
<td>Logic connects sentences.</td>
</tr>
<tr>
<td></td>
<td>Understanding each other's reasoning develops reasoning proficiency.</td>
</tr>
<tr>
<td>Students <strong>talk about each other's thinking</strong> (not just their own).</td>
<td>Revising explanations solidifies understanding.</td>
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<tr>
<td></td>
<td>Academic language promotes precise thinking.</td>
</tr>
<tr>
<td>Students <strong>revise their thinking</strong>, and their written work includes revised explanations and justifications.</td>
<td>ELLs develop language through explanation.</td>
</tr>
<tr>
<td>Students look for more precise ways of expressing their thinking, encouraging each other to look for and use <strong>academic language</strong>.</td>
<td>Productive struggle produces growth.</td>
</tr>
<tr>
<td><strong>English learners produce language</strong> that communicates ideas and reasoning, even when that language is imperfect.</td>
<td></td>
</tr>
<tr>
<td>Students <strong>engage and persevere</strong> at points of difficulty, challenge, or error.</td>
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</table>
About Looking for Standards in the Mathematics Classroom

The Common Core State Standards (CCSS) define eight standards for students' Mathematical Practice. You will find evidence of the students’ practices by observing their actions and by reviewing their work. This card is intended to focus attention on some of the vital student actions that will be observable in CCSS-M classrooms (see reverse). However, not all standards will be evident at all times or applicable for every activity.

The practices are available at corestandards.org

A ➤ Equity requires participation: Explaining one’s ideas and hearing the reactions of others promotes learning. Thus in classrooms in which a few students do all the talking, learning opportunities are distributed inequitably. Over time silent students may come to believe they are not expected to talk, and may disengage entirely. When all students are given the time to explain their thinking, a greater investment of every student in the instructional activity is demanded and rewarded, and the opportunity for students to serve as learning resources for each other is maximized.

B ➤ Logic connects sentences: A hallmark of the understanding prioritized by the CCSS-M is the ability to use mathematical reasoning to construct and defend an argument (this is what I did and why it makes sense). Brief, single-sentence student utterances are generally insufficient for a viable argument.

C ➤ Understanding each other’s reasoning develops reasoning proficiency: Students learn about mathematics by exploring their own and others' reasoning in problem-solving situations. Actively listening to peers increases the time focused on mathematical thinking and promotes the cognitive flexibility that is highly valued in college and career.

D ➤ Revising explanations solidifies understanding: As students become more mathematically proficient and their reasoning improves, they should be able to identify flaws in their own and others' thinking. Revising work as a routine matter leads to better problem solving.

E ➤ Academic language promotes precise thinking: Mathematically proficient students comprehend and produce mathematical representations (symbolic expressions, graphs, tables, number lines, etc.) that are embedded in ordinary and academic explanations and justifications. Students comprehend and produce the paragraphs, sentences, phrases and words characteristic of justifications, explanations and word problems typical for their grade level.

F ➤ ELLs develop language through explanation: English learners may hesitate to speak in class precisely because their control of English is limited. But practice speaking allows them to become more proficient. Bridging the language barrier is important for ELLs to thrive in the types of classrooms the CCSS-M promotes.

G ➤ Productive struggle produces growth: When students persist in making sense of a challenging problem and trying different strategies for solution, they are more likely to learn the mathematics than students who give up quickly or avoid challenge to the greatest extent possible.
\[
\frac{1}{4} \div 3 = \frac{1}{12}
\]

Does the model represent the equation. Why or why not?

- No. When you use multiplication, \( \frac{1}{4} \times 3 = \frac{3}{4} \).

- No. \( 3 \div \frac{1}{4} = 12 \) because you have three wholes and \( \frac{1}{4} \) goes into three 12 times.

- Yes. Each of the fourths in the whole is repartitioned into 3 same size pieces.
  \[\frac{1}{4} \times \frac{1}{3} = \frac{1}{12}\] and that means \( \frac{1}{4} \div 3 = \frac{1}{12} \).

- Yes. \( 4 \times 3 = 12 \). That's 12 wholes and one of them is shaded.
Kai, Lili, and Omar each need some yellow paint. There is half of a gallon of yellow paint left.

If they divide the paint equally among themselves, how much yellow paint will each artist get?

Lili says, "Each person gets \( \frac{1}{6} \) of a gallon of yellow paint."

Kai says, "Each person gets \( \frac{1}{3} \) of a gallon of yellow paint."

Omar says, "Each person gets \( \frac{1}{4} \) of a gallon of yellow paint."
RESOURCES

http://www.smarterbalanced.org/

http://www.parcconline.org/


http://math.serpmedia.org/5x8card/

http://www.corestandards.org/