Teresa is going to put down new ceramic tiles on her bathroom floor. She has selected square tiles that are 4 inches on each side. These are the kind of tiles that can be placed right next to each other without leaving additional space for grout. At The Home Station, she learned how to cut the tiles in case she needs any fractional pieces to cover her floor completely.

This diagram of the bathroom floor shows the dimensions of the floor space she needs to cover. The sink area does not get tiled.

Questions: How many tiles will she need to buy to cover her floor? How many tiles will she have to cut in order to cover the entire space?

Extra: What is the size, using whole numbers, of the largest square tile that could be used to tile the entire floor with no cut pieces?
Teresa’s Tiles “Scenario”

Instead, just draw the picture on the board and say, “Write down as many things as you can that you notice about this picture.”

Teresa’s Tiles, Student Work

Things that some “low-performing” 8th graders noticed about the picture:

• two sides are equal
• two sides are 60 inches
• one side is 28 inches
• they are longest
• one side is 42 inches
• it used to be a square
• your lines aren’t very straight
• the short side of the sink is 18”
• the sink is a rectangle
• the long side of the sink is 32”
• can find the area of the whole thing by making it two pieces
Congruent Rectangles Scenario I

- The seven small rectangles in this picture are congruent.
Congruent Rectangles Scenario II

- The seven rectangles in this picture are congruent.
- The area of the large rectangle is 756 square centimeters.

Noticing and Wondering with Textbooks

Apple juice costs 50¢. The juice machine accepts quarters, dimes, and nickels.

Mr. Gavin has a ladder that is 100 centimeters tall.
Ms. Cornell has a ladder that is 2 meters tall.

To make a stained glass window, Robert used 16 pieces of glass. Seven of the pieces were red.
Noticing and Wondering with Textbooks

Mike had 3 puzzles.
Now he has 5 puzzles.

A store has the floor plan shown. The area of the women’s department is ___.

Noticing and Wondering with Textbooks

Male and Female Medical Doctors

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>1970</td>
<td>80</td>
<td>10</td>
</tr>
<tr>
<td>1980</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>1990</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>2000</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>2010</td>
<td>0</td>
<td>50</td>
</tr>
</tbody>
</table>
Noticing and Wondering with Textbooks

Think About This Situation


a) How would you describe the trends shown in the data plots and the linear models that have been drawn to match patterns in those points?

b) Why do you suppose the percentage of women doctors has been increasing over the past 40 years?

c) Would you expect the trend in the graph to continue 10 or 20 years beyond 2000?

d) How would you go about finding function rules to model the data trends?

e) If you were asked to make a report on future prospects for the percentages of male and female doctors, what kinds of questions could you answer using the linear models?

Noticing and Wondering with Textbooks

The geometry of shape is among some of the earliest mathematics. It was used in ancient Egypt to construct the pyramids and to measure land. For example, when the yearly floods of the Nile River receded, the river often followed a different path. As a result, the shape and size of fields along the river changed from year to year. It is believed that the Egyptians used ropes tied with equally-spaced knots to re-establish land boundaries. To see how a knotted rope might be used in building design and measuring, think about how you could use a piece of rope tied into a 24-meter loop with knots at one-meter intervals.
Noticing and Wondering with Textbooks

Think About This Situation

Suppose that you and two or three friends each grabbed the rope at a different knot and pulled outward until the loop formed a particular shape.

a. How could you position yourselves so that the resulting shape was an equilateral triangle? An isosceles triangle? A right triangle?

b. How are the perimeters of the three triangles related? How do you think the areas are related?

c. How could you position yourselves so that the resulting shape was a square? A rectangle? A parallelogram that is not a rectangle?

d. How are the perimeters of the three quadrilaterals related? How do you think the areas are related?

Noticing and Wondering with Naked Problems

20. \( \frac{5}{6} - \left( -\frac{4}{3} \right) \)  
21. \( \frac{3}{4} - \left( -2 \frac{5}{12} \right) \)  
22. \( 1 \frac{1}{15} - \left( -\frac{5}{60} \right) \)  
23. \( -2 \frac{1}{8} - 4 \frac{1}{4} \)

24. \( -4 \frac{2}{3} - 6 \frac{1}{4} \)  
25. \( -5 \frac{1}{2} + 8 \frac{2}{3} \)  
26. \( -7 \frac{2}{5} + \left( -\frac{3}{4} \right) \)  
27. \( 7 \frac{4}{5} + 11 \frac{1}{3} \)
Some Twitter Love for Noticing and Wondering

Andrew Gaël
@bkdidact
Just wanted to let @MFAnnie @maxmathforum @SuMACzanne know I just had P/T confs and the parents LOVED our work from @themathforum!

10:21 PM - 06 Dec 14

What’s This Really Look Like?

• Powerful Problem Solving, by Max Ray

• Videos of Teresa’s Tiles (and more!) from http://mathforum.org/pps/
Some iPad Fun

• Open Safari
• Search for Game About Squares
• Play

Characteristics of Strong Readers

• They are motivated to read.
• They are able to read words accurately and automatically.
• They comprehend what they read.
• They use a variety of strategies to tackle words they don’t recognize.
• They use active problem solving strategies to search for information, to determine meaning, to make sense of words, to make connections.
Reading Lesson Objectives

• What were your lesson objectives for last week’s reading lessons?

Reading Strategies – Unfamiliar Words

• Sound it out
• Context clues
• Apply known patterns to a new situations
Reading Strategies - Comprehension

- Predicting
- Estimating
- Hypothesizing
- Make a movie in your mind
- Storyboarding (beginning, middle, end)
- Story elements (character, setting, problem, solution)

What Do Readers Need?

- Direct and explicit instruction in the skills and strategies of proficient reading.
- Time to talk about books. Just five minutes of conversation can ramp up comprehension.
- Most reading skills and strategies are also thinking skills and strategies.
Encouraging Sense-Making in Math

Q: How do we cultivate a classroom focused on *sense making* rather than *answer-getting*?

A: Ask about ideas, not answers.

This can be really simple:

“Tell me something about number 7.”

*instead of*

“What's the answer to number 7?”

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Encouraging Sense-Making in Math

“Who tried something that didn’t work?”

“What's a hint you would give a student who is stuck?”

“What makes this problem hard?”

“Does this problem remind you of anything we have done recently?”

*What sorts of questions do you ask during math? Record yourself and find out!*
CueThink

- Open app on iPad
- Create new account
- Class code: m4xv2z
- Take the tour
- Check your assignments and do Let's Explore!
Brainstorming and Reflection

• When could you use a “scenario” next week?
• Where can you see this fitting in right away?
• (Want to do the third grade sense-making experiment with me?)