GROUP A: Wendy Vincens, Mayra Frosti, Kelly Haggerty, Patrice Welch

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2) Individually work the problem
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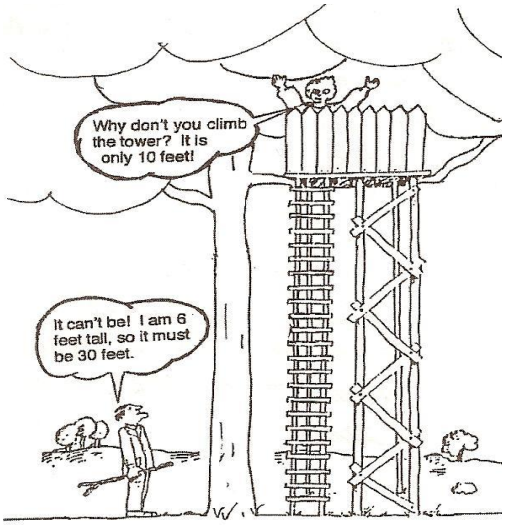
4) Use the Talk frame template to help you prepare a mini-lesson
5) Talk with your team about how you will teach this mini-lesson (who will do what, etc.)
6) Teach the mini-lesson to your assigned team **(Group B)**



Tree House Problem

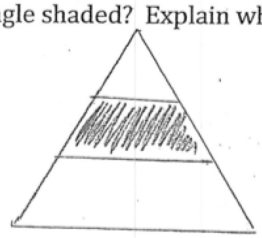
These people disagree on the height of the tree house. How high do you think it is? Explain your reasoning.

(The person in the tree house says, "Why don't you climb the tower. It is only 10 feet tall." The person on the ground says, "It can't be! I am 6 feet tall, so it must be 30 feet.")

(from Lamon's *Teaching fractions and ratios for understanding* book)

Triangle Fraction Problem

Is 1/3 of the triangle shaded? Explain why or why not.



(from a Mansfield teacher)

GROUP B: Sarah Edwards, Diane Ozmun, Catherine Hain, Karen Herrick

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6. Teach the mini-lesson to your assigned team **(Group A)**

School Days Problem

Alec and Felix are brothers who go to different schools. The school day is just as long at Felix's school as at Alec's school. At Felix's school, there are 6 class periods of the same length each day. Alec's day is broken into 3 class periods of equal length.

One day, it snowed a lot so both of their schools started late. Felix only had four classes and Alec only had two. Alec claims his school day was shorter than Felix' was because he had only two classes on that day. Is he right? Explain how you know.

(from illustrativemathematics.org – grade 3)

Student Height Problem

Mr. Liu asked the students in his fourth-grade class to measure their heights. Here are some of the heights they recorded.

Student	Height
Sarah	50 inches
Jake	$4\frac{1}{4}$ feet
Andy	$1\frac{1}{2}$ yards
Emily	4 feet and 4 inches

List the students from tallest to shortest. Explain how you figured the order.

(adapted from illustrativemathematics.org – grade 4)

GROUP C: Shannon Harrington, Donna Heikkinen, Laura Kowaleski, Grace Deangelis

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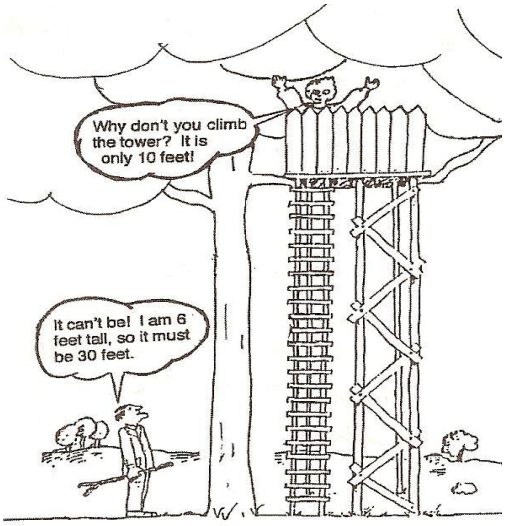

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(from Lamon's *Teaching fractions and ratios for understanding* book)

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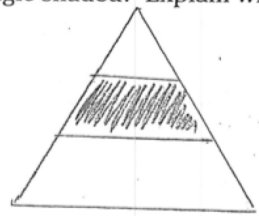

(from a Mansfield teacher)

GROUP D: Chuck Warinksy, Teresa Maturino, Michelle McKnight, Kylie Hoke

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School Days Problem

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One day, it snowed a lot so both of their schools started late. Felix only had four classes and Alec only had two. Alec claims his school day was shorter than Felix' was because he had only two classes on that day. Is he right? Explain how you know.

(from illustrativemathematics.org – grade 3)

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List the students from tallest to shortest. Explain how you figured the order.

(adapted from illustrativemathematics.org – grade 4)

GROUP E: Lisa Miner, Monica Brahm, Christine Giaquinto, Andrea Flynn

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3. With your team, talk about the problem
   - What's worth discussing in a mini-lesson related to this problem?
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4. Use the Talk frame template to help you prepare a mini-lesson
5. Talk with your team about how you will teach this mini-lesson (who will do what, etc.)
6. Teach the mini-lesson to your assigned team **(Group F)**

Piggy Bank Problem

Alicia opened her piggy bank and counted the coins inside. Here's what she found:

- 22 pennies
- 5 nickels
- 5 dimes
- 8 quarters

a) What fraction of the coins are dimes? Explain how you know.

b) What fraction of the total value of the coins in the piggy bank is made up of dimes? Explain how you know.

c) Alicia realizes she looked too quickly. One of the nickels is really a quarter. Would this change your answer to either part a or part b? Explain why or why not.

(adapted from illustrativemathematics.org – grade 4)

Ellen's Rule Problem

Ellen says:
When you multiply by a number, you will always get a bigger answer.
Look, I can show you.

- **Start with 9. Multiply by 5.**
- **9x5=45**
- **45 > 5**

It even works for fractions

- **Start with ½. Multiply by 4.**
- **½ x 4 = 2**
- **2 > ½**

Does Ellen's rule always work? Explain your reasoning.

(adapted from Illustrativemathematics.org – grade 5)

GROUP F: Danielle Hodge, Susan Kelley, Tracy Pietevich, Deryann King

1. With your team, select one of these problems
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3. With your team, talk about the problem
   - What's worth discussing in a mini-lesson related to this problem?
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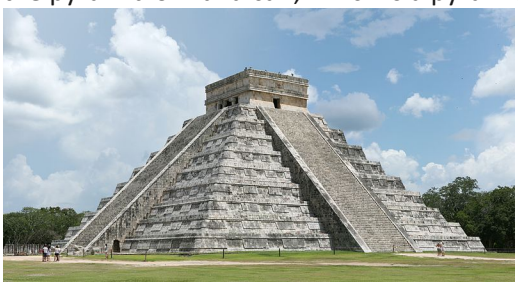
5. Talk with your team about how you will teach this mini-lesson (who will do what, etc.)
6. Teach the mini-lesson to your assigned team **(Group E)**

Chichén Itzá Problem

Chichén Itzá was a Mayan city in what is now Mexico. The picture below shows El Castillo, also known as the pyramid of Kukulcán, which is a pyramid located in the ruins.



The temple at the top of the pyramid is approximately 24 meters above the ground, and there are 91 steps leading up to the temple. How high above the ground would you be if you were standing on the 50th step?

(adapted from Illustrativemathematics.org – grade 6)

Job Earnings Problem

Kell works at an after-school program at an elementary school. The table below shows how much money he earned every day last week.

	Monday	Wednesday	Friday
Time worked	1.5 hours	2.5 hours	4 hours
Money earned	$12.60	$21.00	$33.60

Mariko has a job mowing lawns that pays $7 per hour.

Who would make more money for working 10 hours? Explain how you know.

Who makes more money per hour? How much more per hour?

(adapted from Illustrativemathematics.org – grade 8)

GROUP G: Barbara Riley, Pari Ghetia, Mike DiCicco, Brenda Moutlon

1. With your team, select one of these problems
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   - What's worth discussing in a mini-lesson related to this problem?
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Piggy Bank Problem

Alicia opened her piggy bank and counted the coins inside. Here's what she found:

- 22 pennies
- 5 nickels
- 5 dimes
- 8 quarters

a) What fraction of the coins are dimes? Explain how you know.

b) What fraction of the total value of the coins in the piggy bank is made up of dimes? Explain how you know.

c) Alicia realizes she looked too quickly. One of the nickels is really a quarter. Would this change your answer to either part a or part b? Explain why or why not.

(adapted from illustrativemathematics.org – grade 4)

Ellen's Rule Problem

Ellen says:
When you multiply by a number, you will always get a bigger answer.
Look, I can show you.

- **Start with 9. Multiply by 5.**
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It even works for fractions

- **Start with ½. Multiply by 4.**
- **½ x 4 = 2**
- **2 > ½**

Does Ellen's rule always work? Explain your reasoning.

(adapted from Illustrativemathematics.org – grade 5)

GROUP H: Jeff Burnham, Jocelyn Dunnack, Jeana Favat, Jen Downes

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5. Talk with your team about how you will teach this mini-lesson (who will do what, etc.)
6. Teach the mini-lesson to your assigned team **(Group G)**

Which is more square?

Which is *more square*, a rectangle that measures 35" x 39" or a rectangle that measures 22" by 25"? Explain how you know.

(from Lamon's *Teaching fractions and ratios for understanding* book)

The Mystery Bags Game

A king loves to play the Mystery Bags game. First, the jester takes one or more empty bags and fills them each with the same amount of gold. Next, he takes out his pan balance and places some combination of bags of gold and one-ounce weights on each of the pans. The king then tries to figure out how many ounces of gold are in one mystery bag.
You have been asked to help the king play the game. Without first translating to algebraic notation, figure out how much gold is in each bag. Explain your reasoning.

a) There are 8 bags of gold and 10 ounces on one side and 90 ounces on the other side.
b) There are 11 bags of gold and 65 ounces on one side and 4 bags of gold and 100 ounces on the other side.
c) There are 15 bags of gold and 7 ounces on both sides. (At first the king thought this would be easy, but then found it to be incredibly hard)
d) There are 4 bags of gold and 8 ounces on one side and 6 bags of gold and 12 ounces on the other side.

Adapted from *Interactive Math Program* 1 (IMP1), 1994

GROUP I: Jessica Albert, Kristin Smith, John Tedesco, Katelyn Miner

1. With your team, select one of these problems
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   - What's worth discussing in a mini-lesson related to this problem?
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4. Use the Talk frame template to help you prepare a mini-lesson
5. Talk with your team about how you will teach this mini-lesson (who will do what, etc.)
6. Teach the mini-lesson to your assigned team **(Group J)**

Which is more square?

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You have been asked to help the king play the game. Without first translating to algebraic notation, figure out how much gold is in each bag. Explain your reasoning.

e) There are 8 bags of gold and 10 ounces on one side and 90 ounces on the other side.
f) There are 11 bags of gold and 65 ounces on one side and 4 bags of gold and 100 ounces on the other side.
g) There are 15 bags of gold and 7 ounces on both sides. (At first the king thought this would be easy, but then found it to be incredibly hard)
h) There are 4 bags of gold and 8 ounces on one side and 6 bags of gold and 12 ounces on the other side.

Adapted from *Interactive Math Program* 1 (IMP1), 1994

GROUP J: Belinda Perez, Jeffry Kasparek, Adrianne Satin, Cathy Mazzotta

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6. Teach the mini-lesson to your assigned team **(Group I)**

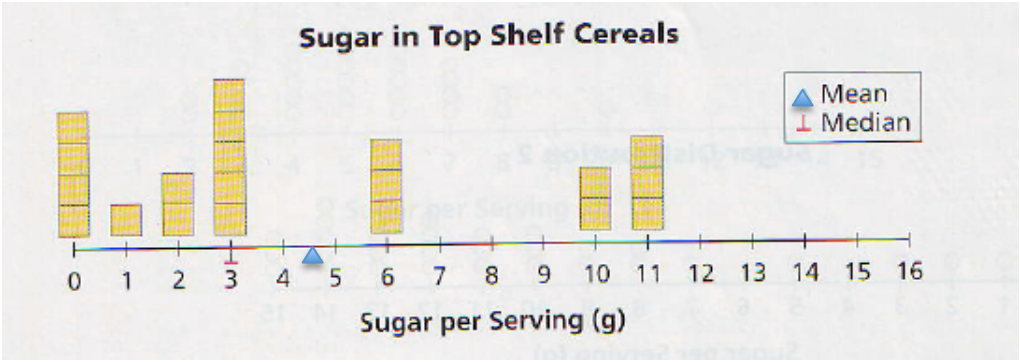
Traffic Jam Problem

Last Sunday an accident caused a traffic jam 12 miles long on a straight stretch of a two-lane freeway. How many vehicles do you think were in the traffic jam? Explain your reasoning.

(Adapted from Illustrative Mathematics – High School – Number & Quantity)

Sugar on the Shelf

Shown in the graph is the number of grams of sugar per serving for 20 breakfast cereals that are commonly found on the top shelf in the grocery store. The mean and median for the amount of sugar has also been marked.



a. Suppose you remove the three cereals with 6 grams of sugar per serving and add three new cereals, each with 9 grams of sugar per serving. What happens to the mean and the median? Why do you think this happens?

b. Use the new distribution from part (a). Suppose you remove a cereal with 3 grams of sugar and add a cereal with 8 grams of sugar. How do the mean and the median change?

c. Suppose you remove another cereal with 3 grams of sugar and add another cereal with 8 grams of sugar. How do the mean and the median change?

d. Suppose you remove a third cereal with 3 grams and add a third cereal with 8 grams of sugar. How do the mean and the median change? Explain how you know.

(Adapted from CMP)