Asking Richer Questions in Instruction and Assessment

Marian Small January 2020

- I have the opportunity today to share my perspective on what I think matters the most in teaching children and why.

- Most of my examples will focus on mathematics, but not all, and the ideas will pertain to all disciplines

What is the Point of School?

- Clearly, part of the point of school is the learning of social skills.
- But what about the learning side?

What is the Point of School?

My goals as a teacher are:

- To make learning something attractive
- To teach a student to make sense of what that student sees and hears and to teach him or her to figure out how to handle new situations

What is the Point of School?

- There is some element of memorizing or repeating that is part of school, but in a digital era, this can’t be the most important goal anymore.

Within our disciplines

- I think we have an obligation to focus more on important ideas and not treat every skill or piece of information as equally important.
- I am not sure the curriculum we are given always helps us do that, so we will need to analyze our curriculum to figure out what those ideas are.

And

- We also have to figure out how to make sure we both instruct and assess an understanding of those ideas we have deemed as important to make sense of.

Making Sense

- David Sousa and Carol Ann Tomlinson in “Differentiation and the brain: How neuroscience supports the learner-friendly classroom” suggest:

- Nothing goes into long-term memory unless it makes sense and has meaning.

So this morning

- We will look at two ideas.

1. How do we decide on what is important?

2. How do we make sure the questions we ask in both instruction and assessment focus on understanding and not just repeating?

First

- Making Decisions about what is important

Some example

- Grade 2 math

Here is an outcome in the AB curriculum:

- Represent and describe numbers to 100, concretely, pictorially and symbolically.

Some examples

Some of the achievement indicators:

- Represent a given number pictorially.
- Represent a given number using concrete materials.
- Record a given number (0 – 20) in words.

But..

- Most of these can be done without much understanding, by copying.
- We do want some of that, but that cannot be the focus.
- So what would be my focus?

Maybe

- That there are always a ton of ways to express any number and that this is handy since we see different things about a number by representing it differently.

Let’s try

- Everyone in the room think of several ways to show 25.

Here are some of mine

- 20 + 5

O	O	O	O	O
O	O	O	O	O

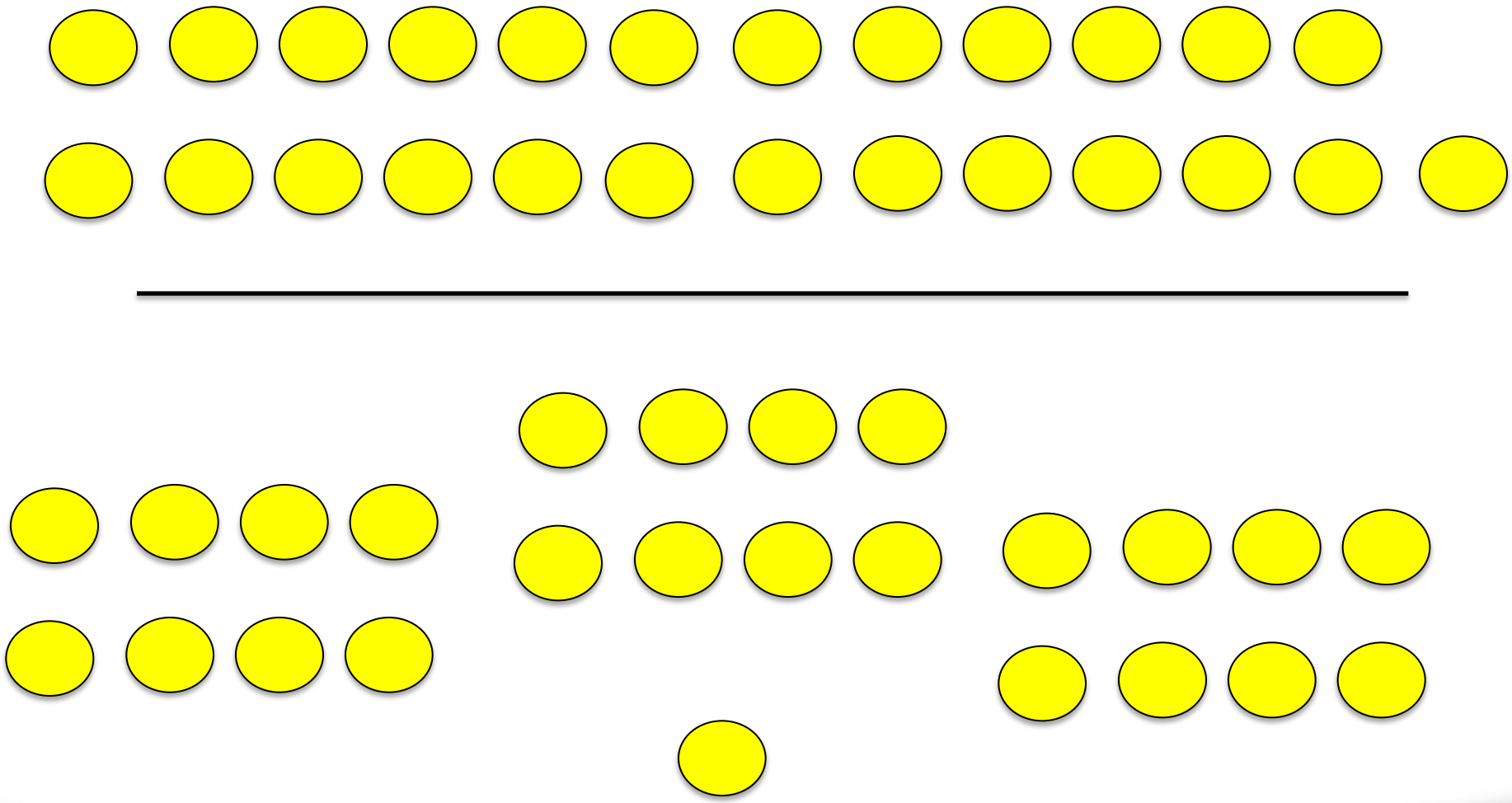
O	O	O	O	O
O	O	O	O	O

O	O	O	O	O

Here are some of mine

- Twenty-five
- 30 – 5

Here are some of mine



Which way

- Helped you see that 25 is five 5s?
- Helped you see that 25 is more than 20?
- Helped you see that 25 is less than 30?
- Helped you see that 25 is odd?
- Helped you see that 25 is not made up of groups of 8?

Let’s look at Grade 5

- Demonstrate an understanding of fractions by using concrete, pictorial and symbolic representations to:
- Create sets of equivalent fractions
- Compare fractions with like and unlike denominators

Some achievement indicators

- Determine if two fractions are equivalent, using concrete materials or pictorial representations
- Identify equivalent fractions for a given fraction
- Position a set of fractions on a number line and explain strategies use to determine the order.

So what’s important

- That some fractions are quick to compare and others take work.
- Which might be easy for you to compare?

- Maybe 2/5 and 4/5
- Maybe 2/5 and 2/3
- Maybe 1/10 and 5/6

So what's important

- That sometimes using another name for a fraction helps you compare it more easily to another fraction

- Maybe it is easier to compare 1/3 and 3/8 if you rename them as 8/24 and 9/24 (or as 3/9 and 3/8)

So what's important

- That when two fractions are equivalent, the "ratio" of the numerator to denominator remains the same.

- 18/36 = 1/2 since 18 is half of 36 just like 1 is half of 2
- 4/10 = 6/15 are both 2/5 since 4 is 2/5 of 10 just like 6 is 2/5 of 15

So what’s important

- That the distance between the numerator and denominator of a fraction is irrelevant when comparing fractions

- For example, think of two fractions where the numerator and denominator are 5 apart where one is fraction is much greater than the other.
- (1/6 and 95/100)

So whatever the curriculum is..

- You need to decide what is really important.

- For example, in art, you might want students to realize that even still pictures can show depth by using size variations.

So whatever the curriculum is..

- If it’s learning French, it’s realizing that sometimes the individual words can be translated and the French word(s) directly used, but often adjustments need to be made, whether including le or la or using idioms in a different way

So whatever the curriculum is..

- If it’s learning about comprehending text in English, it is learning that sometimes the pictures accompanying the text help clarify the text, but not all the time.

I am proposing

- That groups of teachers would benefit from collegially deciding what the bigger ideas that matter are in their curriculum.

Take a moment now

- Talk to someone near you.
- Talk about something you teach and think about one or two important ideas you would want to get across.

Now let’s talk about understanding versus doing

- I am going to use math as a vehicle to talk about what the differences in questions would look like.

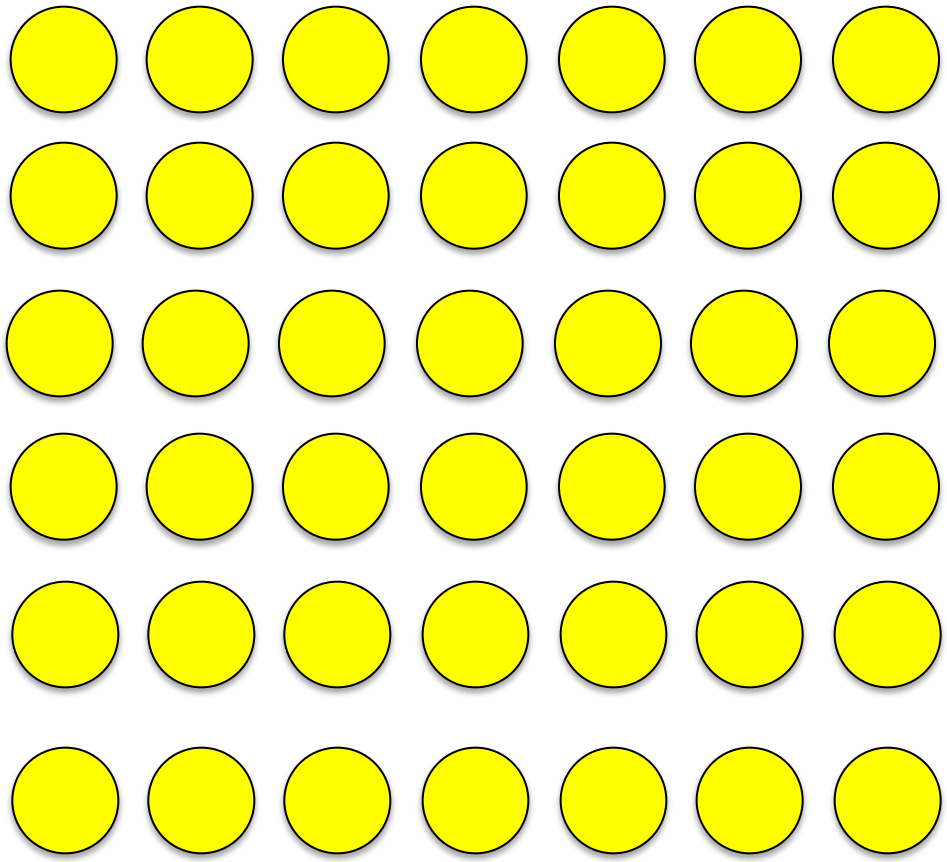
- But then you will have an opportunity to consider other disciplines too.

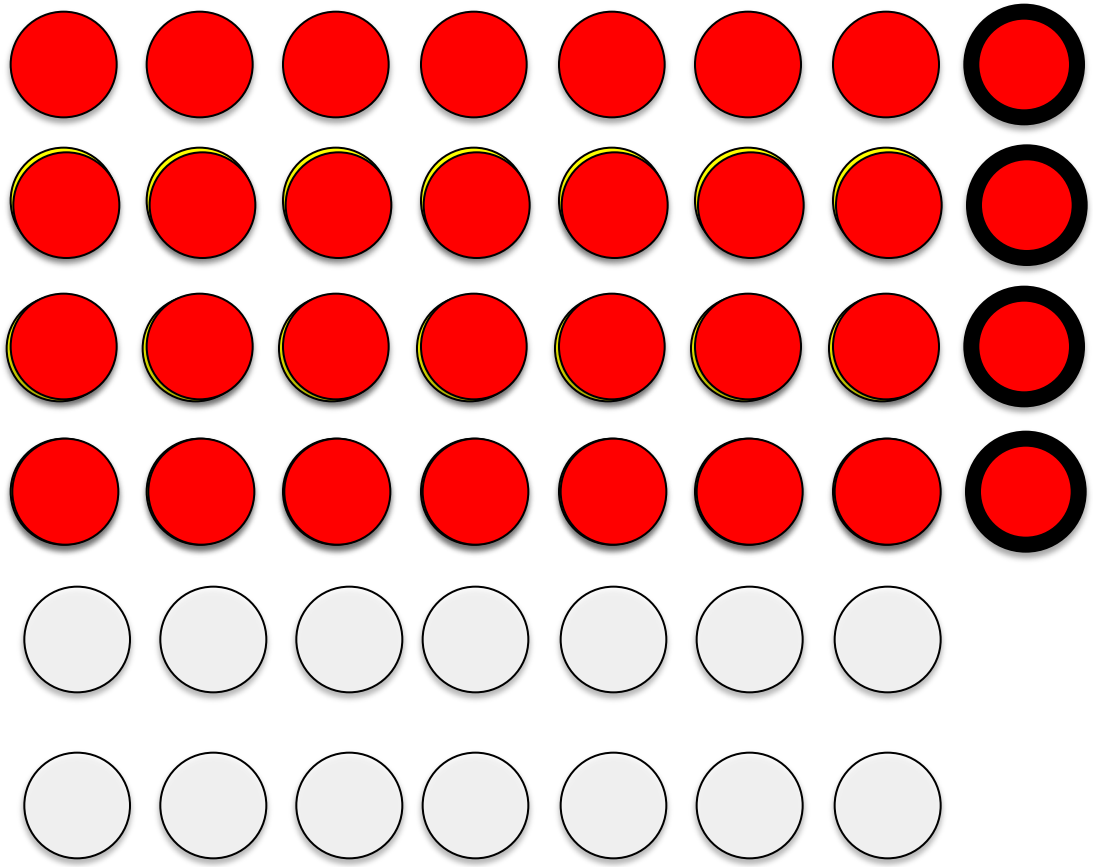
An example

- DO: What is 6 + 5?
- UNDERSTAND: How do you know that 6 + 5 must be more than 10 without knowing it is 11?

An example

- DO: What is 4 x 8?
- UNDERSTAND: How do you know that 6 x 7 must be more than 4 x 8 without knowing they are 42 and 32?



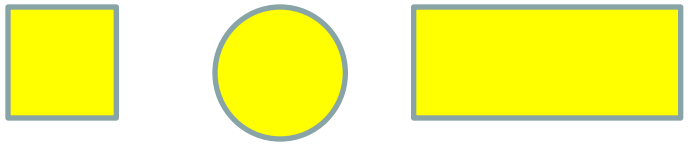


An example

- DO: Decompose 42 into tens and ones.
- UNDERSTAND: Are there more ways to decompose 42 into equal groups or into nonequal groups? Explain.

An example

- DO: Which is the square?



- UNDERSTAND: In what way are these two shapes alike?

An example

- DO: Count by 5s from 25.
- UNDERSTAND: If you count by 5s starting at 10 [But don’t do it.], what is a number past 100 you will say and another you will NOT say? How do you know?

An example

- DO: What is 150 – 87?
- UNDERSTAND: WITHOUT GETTING THE ANSWERS, how do you know that 150 – 87 has to be more than 131 – 93?

An example

- DO: Which is more: 2/3 or 1/5?
- UNDERSTAND: Draw a picture that shows why 2/3 is more than 1/5.

An example

- DO: How many metres is 4.2 km?
- UNDERSTAND: When you describe a measurement with a different unit, you multiply by 1000. What could the original unit and final unit be?

An example

- DO: Plot the point (3,4) and (5,7) on a coordinate grid.
- UNDERSTAND: The point ([],*) is very far to the right of (0,0) but not that much down. What could the coordinates be?

An example

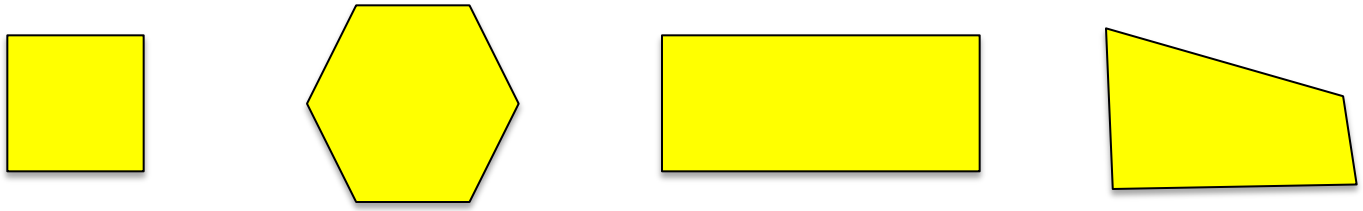
- DO: Divide 113 by 6.
- UNDERSTAND: How do you know that 113 ÷ 6 cannot be a whole number?

An example

- DO: Which is more: 3/8 or 5/11?
- UNDERSTAND: If Fraction B has a greater numerator and denominator than Fraction A, does Fraction B have to be greater?

An example

- DO: Sort these shapes

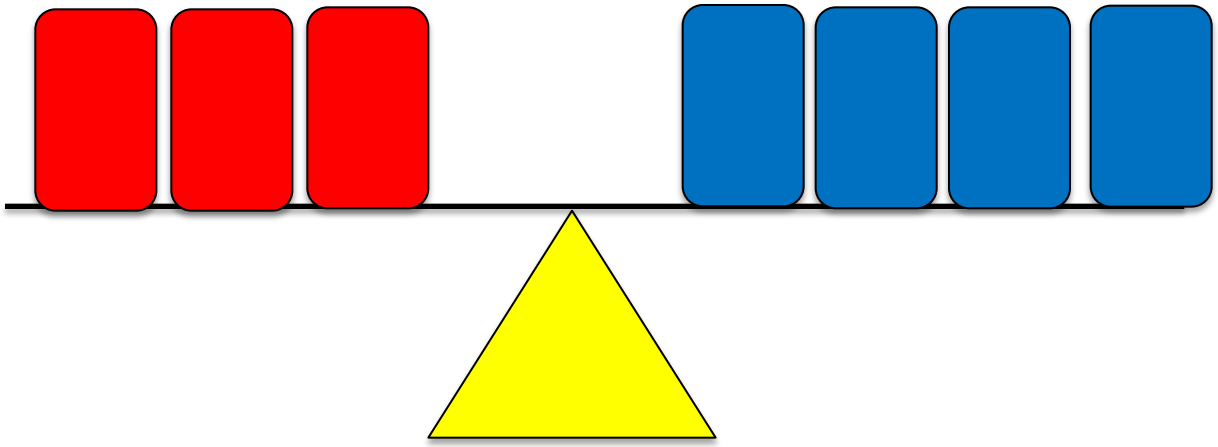


A B C D

- UNDERSTAND: How could you sort the shapes so that Shape A and Shape B go together? How can you do it so they don’t go together?

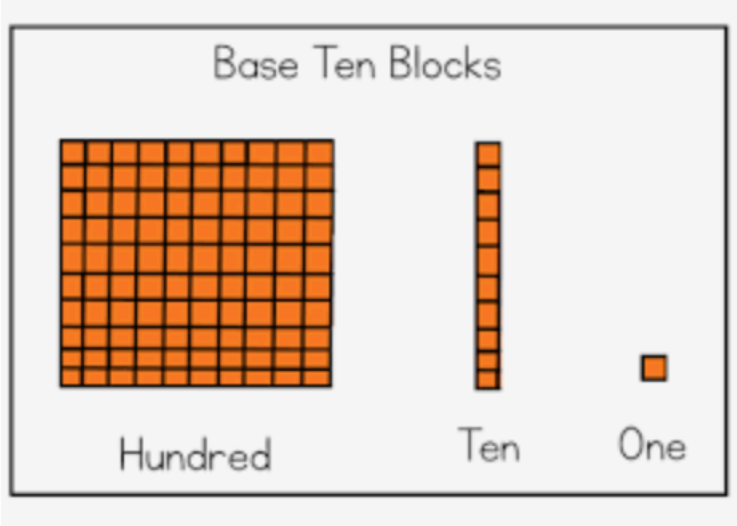
An example

- DO: 5 x [] = 50. Solve for [].
- UNDERSTAND: What do you know about the number of marbles in each box?



An example

- DO: Model 43 with base ten blocks.
- UNDERSTAND: Is it possible to use 16 base ten blocks to show 43? Is it possible to use 29 blocks?

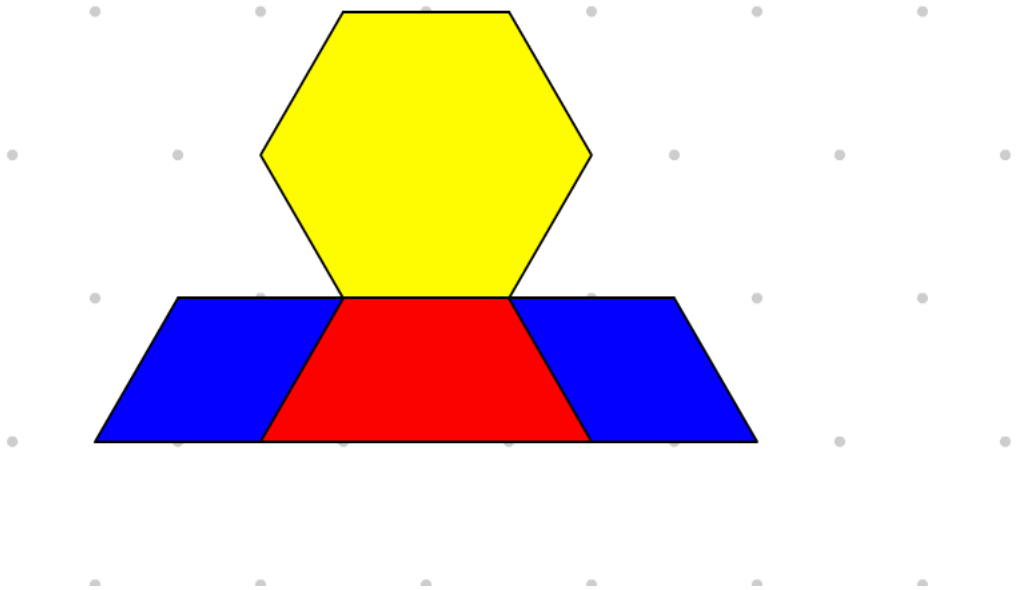


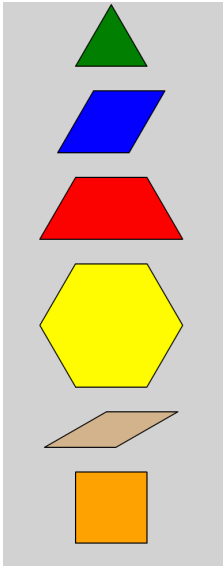
An example

- DO: Model 75¢ using quarters.
- UNDERSTAND: You can model 75¢ with 15 nickels. How do you know you could model it with 8 coins too?

An example

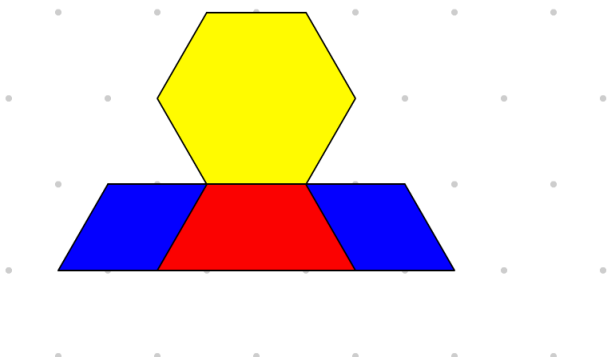
- DO: How many green blocks would it take to cover this pattern block design?

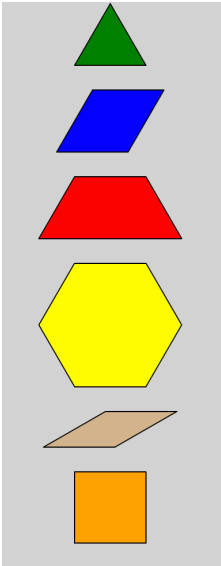




An example

- UNDERSTAND: Why might one person describe the yellow part of this design as slightly less than ½ and another as a lot less and both be right?





Now you try

- Think of a straightforward question in your discipline (if it’s not math) or in math and talk about how to change it to an understanding question.

This afternoon

- I hope to see some of you again this afternoon.
- Our focus will be on differentiating instruction, but there will be continued attention to checking on understanding and not just doing and focusing on ideas that matter.

Any questions?

- I would be happy to entertain any questions.

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