

A decorative graphic consisting of several overlapping, wavy, translucent blue bands that flow across the middle of the slide. The bands vary in opacity and color intensity, creating a sense of movement and depth.

Open Questions to Differentiate Instruction

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Differentiating instruction

- Using open questions and parallel tasks is one very manageable way to differentiate instruction.
- Let's work on open questions first.

They are...

- Questions not only with different strategies but often with different answers or even different interpretations.
- For example, if I say “What shape do you think is most like this circle?”



..., kids can make very different decisions based on very different ideas.


They are used...


- Sometimes as quickish “getting started” activities.
- Sometimes as “main problems”.
- Sometimes in consolidation of a lesson.





Let's look

- We will consider a LOT of examples to give you a feel for them.


- 
- A number more than 100 is really easy to show with base ten blocks. What might it be?
 - A number can be shown with three base ten blocks. What might it be?
 - A number can be shown with 13 base ten blocks. What might it be?


- 
- You show an amount of money with one bill and 4 coins. What could it be?
 - An activity lasted for 1 hour 20 minutes. When could it have started? Ended?
 - The perimeter of a shape is 20 cm. What could it look like?
 - An array has a lot more columns than rows. What multiplication could I be showing?

- 
- Two triangles look a LOT different. What could they look like? What makes them both triangles?
 - A rectangle has a lot of perimeter, but not much area. What could it look like?
 - Think of three ways to continue this to form a growing pattern: 4, 7,

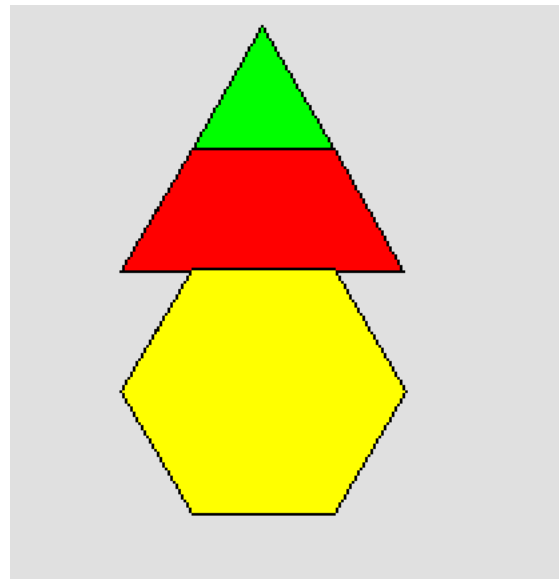
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- A 5-digit number is read as ____ thousand forty _____. What could it be?
 - A decimal number is rounded to 0.4. What might it have been?
 - Two fractions are super easy to compare. What might they have been?
 - You think this multiplication is really easy. What might you put in the blanks?


$$[] \times 2[]$$


- 
- Two fractions are equivalent. Both denominators are more than 10. What could they have been?
 - I had 5 bills and 20 coins. How much money might I have had?
 - I solved a problem by multiplying 23×24 . What might the problem have been?

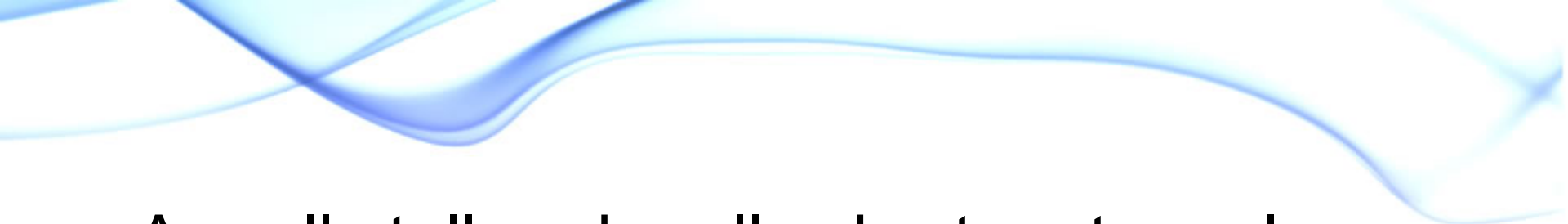
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- How are $\frac{2}{5}$, 0.47 and $\frac{4}{9}$ alike?
 - A number is a lot more than five 42s. What might it be?
 - A number is just a little more than $\frac{1}{2}$. What might it be?


What fractions do you see?




- 
- Fill in the blanks to make this true:
 - _____ is 4 times as much as _____
 - _____ is 118 more than _____

- 
- Write 3000 as the product of three numbers.
 - Now write it as the product of four numbers.

- 
- A really tall and really short rectangular prism had the same volume. What could their dimensions have been?
 - A scalene triangle was almost obtuse. What could its side lengths and angles have been?
 - The 25th number in a growing pattern is 400. What could the pattern have been?

- 
- A spinner lands on green just a little more than red and a little less than blue. Draw the spinner. Give a possible set of ten outcomes.
 - Is 10% a lot or not?

- 
- Use two colours of cubes (or counters or tiles...) so that you see the ratio 4:5. What other ratios do you see?
 - The area of a triangle is four times as much as the area of a parallelogram. What might the dimensions be?
 - The mean of a set of data is 8 more than the median. What could the data set be?



Strategies

- There are some common strategies for opening up questions.
- I'll share these, but remember that it is still critical that the questions have purpose.

Here is the answer

- Provide the answer and ask for the question. For example, the answer is 202. What might the question have been?
- The answer is *a rhombus*. What might the question have been?
- The answer is $x = 4$. What might the question have been?

Alike and different

- How is multiplying decimals like multiplying whole numbers? How is it different?
- How is calculating the area of a triangle like calculating the area of a rectangle? How is it different?
- How is the number 1005 like 205? How is it different?

A particular variation

- Who doesn't belong?
- Who belongs with us?

Who doesn't belong?

$$3/5$$

$$2/3$$

$$3/8$$

$$4/5$$

$$515 \div 3$$

$$7 \times 15$$

$$21 \times 5$$

$$2.1 \times 10$$

Who belong with us?

- 8, 18, 82
- 5×4 , $19 + 1$, $45 - 5$

Choose your own values

- Choose two 2-digit numbers that are not too close together. Multiply them.
- Choose the base and height for a parallelogram. Calculate its area.
- Choose two fractions that are pretty far apart on a number line. Tell how you know they are far apart.

Use “flexible” words

- You divide two numbers and the answer is almost 8. What numbers might you have divided?
- One fraction is just slightly more than another. They have different denominators. What might they be?
- Create a pattern that grows really quickly. What is the 20th term in it?

Let's try

- You will create some open questions, starting with more conventional questions.
- Here is the answer
- Choose own numbers
- Alike and different
- Flexible words

Parallel tasks

- This time the tasks are tighter, but they are at different levels of complexity, one level better suiting some students and the other level better suiting other students.

For example..

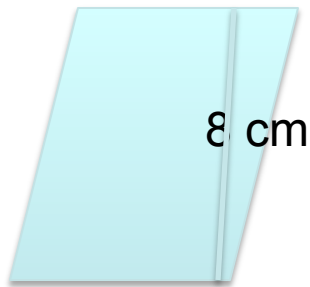
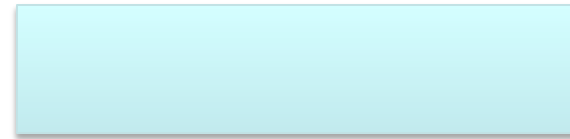
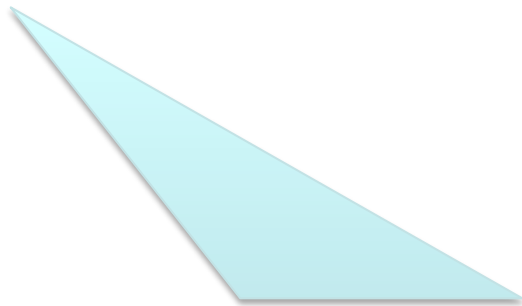
- Choice 1: A bus has 44 seats. How many people could sit, one to a seat, on 12 buses?
- Choice 2: A bus has 50 seats. How many people could sit, one to a seat, on 8 buses?

Common questions

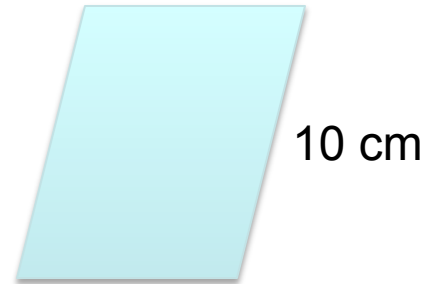
- Is it more than 100 people? Why?
- Is it more than 200 people? Why?
- Would it have been easier or not to figure out the number for 10 buses?
- How did you figure out your number of people?

Or maybe...

- Choose one of these shapes and calculate the area.



5 cm



5 cm

10 cm

Common questions

- Did you have all the measurements you needed or did you have to get more?
- Which more? Why those?
- What formulas did you use or did you use a formula?
- Would it have been easier or harder to get the areas if they had been on grid paper?

Or maybe...

- Choose values for the missing numbers and put the fractions in order from least to greatest.
- Choice 1: $\square/3$, $5/\square$, $4/9$, $8/3$, \square/\square
- Choice 2: $\square/3$, $\square/6$, $8/9$, $8/3$, \square/\square

Common questions

- Which fractions were easiest to compare? Why?
- Did you decide on your missing numbers first or did you think about what was easy to compare first?
- Did $\frac{8}{3}$ have to be greatest? What did that depend on?
- What did you notice about the numerator and denominator of your least fraction?

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