Slide 1:
In this tutorial, we'll use diagrams/models to multiply fractions and whole numbers.

$$4\times\frac{3}{5} \qquad \frac{3}{5}\times 4$$

We'll also compare how **you**… *think about* multiplication involving fractions and whole numbers.

Slide 2:
Before we begin solving our multiplication problem involving a fraction…

Let's recall how **you** *think about* multiplication involving whole numbers.

$$4\times 3$$

How would **you** show the solution to this problem using a diagram/model?

Slide 5: $4\times 3 = 12 \qquad 3\times 4 = 12$

The following examples illustrate the *Commutative Property of Multiplication.*

Based on what you see in the examples… how would **you** explain this property?

How could you verify the *Commutative Property of Multiplication* using diagrams/models?

Slide 8:
Let's go back to our original multiplication problem involving a fraction and a whole number…

$$4 \times \frac{3}{5}$$

Comparing how **you** *think about* and *see* 4×3… Can you use the same thinking when your problem involves a fraction?

How would **you** diagram/model the solution to this problem?

Slide 11:
What would happen if we rewrite the problem by placing the fraction first?

$$\frac{3}{5} \times 4$$

Does this change the way you *think about* or *see* what's happening in the problem?

Do you think this will change the outcome or product?

Slide 13:
Does the *Commutative Property of Multiplication* also apply when your problem involves a fraction?

$$4 \times \frac{3}{5} \qquad \frac{3}{5} \times 4$$

How might your understanding of the *Commutative Property of Multiplication* help when solving this type of problem?

Slide 15:
How would **you** summarize the key steps of **your** solution path when solving using diagrams or models?

$$4 \times \frac{3}{5} \qquad \frac{3}{5} \times 4$$

How would **you** teach your key steps to someone else?

Slide 18:

$$6 \times \frac{2}{3} \qquad \frac{2}{3} \times 6$$

Using **your** key steps, can you…

- Determine the product using a diagram/model?
- Explain each step as you work through your solution path?

Slide 21:
Another student determined the solution by thinking…

Divide six into thirds…
What is one-third of six?
What is two-thirds of six?

$$\frac{2}{3} \; of \; 6$$

Can you explain their thinking?

How would **you** show/illustrate their thinking using a diagram/model?

Slide 23:
Let's focus on the product for both problems…

$$\frac{2}{3}\times 6 = \frac{12}{3} \qquad\qquad \frac{2}{3}\ of\ 6 = 4$$

If both problems have been solved correctly, why do the answers look different?

How could you use a diagram to verify both answers represent the same amount?

Slide 25:
Thinking back to the first multiplication problem we looked at in this tutorial…

$$4\times\frac{3}{5} = \frac{12}{5}$$

Is it possible to regroup/reorganize your diagram to represent the value in another way?

Slide 27:
We have seen different approaches for *thinking about* and *showing* our solution for following problems…

In what ways do you think each approach is different?

In what ways do you think the approaches are the same?

☑I can use diagrams to explain how I see and think about multiplication involving whole numbers

☑I can describe/write examples to verify the *Commutative Property of Multiplication*

☑I can use diagrams to explain how I see and think about multiplication involving fractions & whole numbers

☑I can summarize the steps of my solution path for multiplying fractions & whole numbers

☑I can explain/demonstrate the steps of my solution path when multiplying fractions & whole numbers