Developing an Algorithm for Dividing Fractions

To help me develop an algorithm for dividing fractions, I'll explore what happens when I divide a whole number by a fraction.

$$6 \div \frac{1}{2}$$

- How would I explain the problem using the words *dividend*, *divisor* and *quotient?*

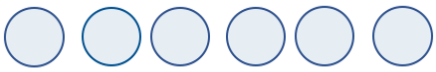
$$6 \div \frac{1}{2}$$

I'll use a diagram to illustrate what happens when I divide six by the fraction *one-half.*

- How would I explain the six circles shown in the diagram?

$$6 \div \frac{1}{2}$$

- How would I use the circles to illustrate dividing by the fraction *one-half?*

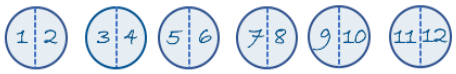


$$6 \div \frac{1}{2}$$

- How do the circles illustrate the solution to my problem?

$$6 \div \frac{1}{2}$$

- How could I also describe my solution using multiplication?



$$6 \div \frac{1}{2} = 12$$

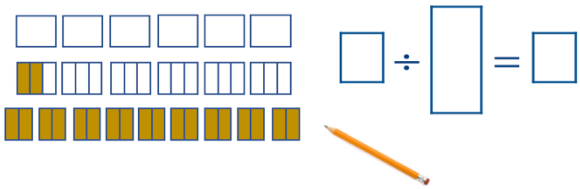
Compare the two calculations shown below.

$$6 \div \frac{1}{2} = 12 \qquad 6 \times \frac{1}{2} = 12$$

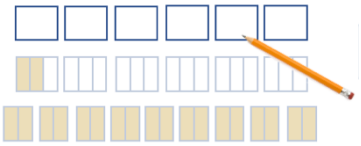
- How is it possible that both calculations solve the same problem?

- How would I explain and demonstrate writing the reciprocal of a fraction?

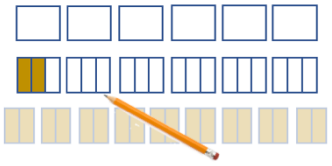
I'll use the diagram shown below to write a new division problem.



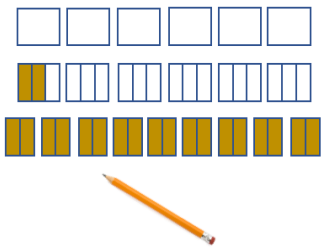
- How would I explain this part of the diagram using my division problem?



- How would I explain this part of the diagram using my division problem?



- How does the last line of the diagram illustrate the solution to my division problem?



- How would I use multiplication to calculate the same solution to my division problem?

$$\boxed{6} \div \boxed{\frac{2}{3}} = \boxed{9}$$

- How would I explain and demonstrate using *multiply by the reciprocal* to solve the problem?

$$6 \div \frac{2}{3}$$

- How will I explain my thinking as I perform the calculations required to solve?

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

I'll try *multiplying by the reciprocal* to solve a new problem… *dividing a fraction by a fraction.*

- How would I explain rewriting the division problem in preparation for *multiplying by the reciprocal?*

$$\frac{2}{3} \div \frac{3}{4}$$

- How will I explain and demonstrate my calculation… *multiply by the reciprocal?*

$$\frac{2}{3} \times \frac{4}{3}$$

- How do I determine if my solution is shown in *lowest terms* or if it can be *simplified?*

$$\frac{2}{3} \times \frac{4}{3} = \frac{8}{9}$$

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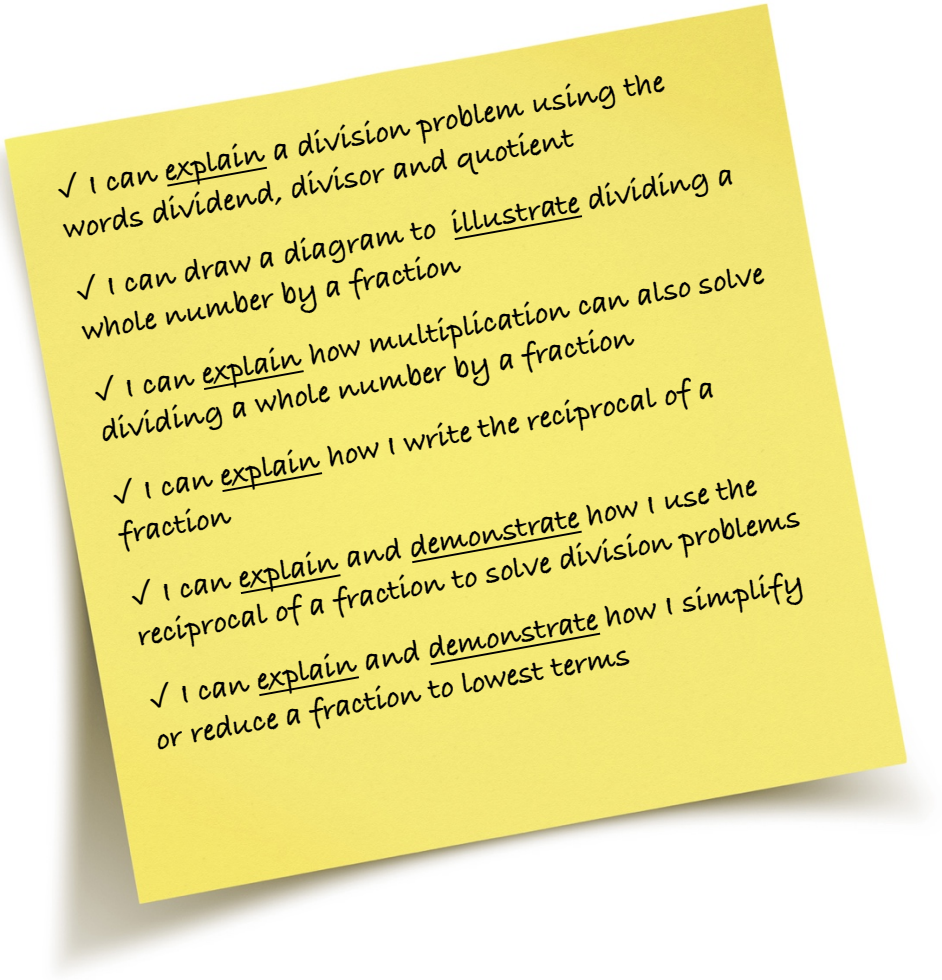
Which statements do I feel confident explaining and demonstrating?
Which statements do I not feel confident explaining and demonstrating?