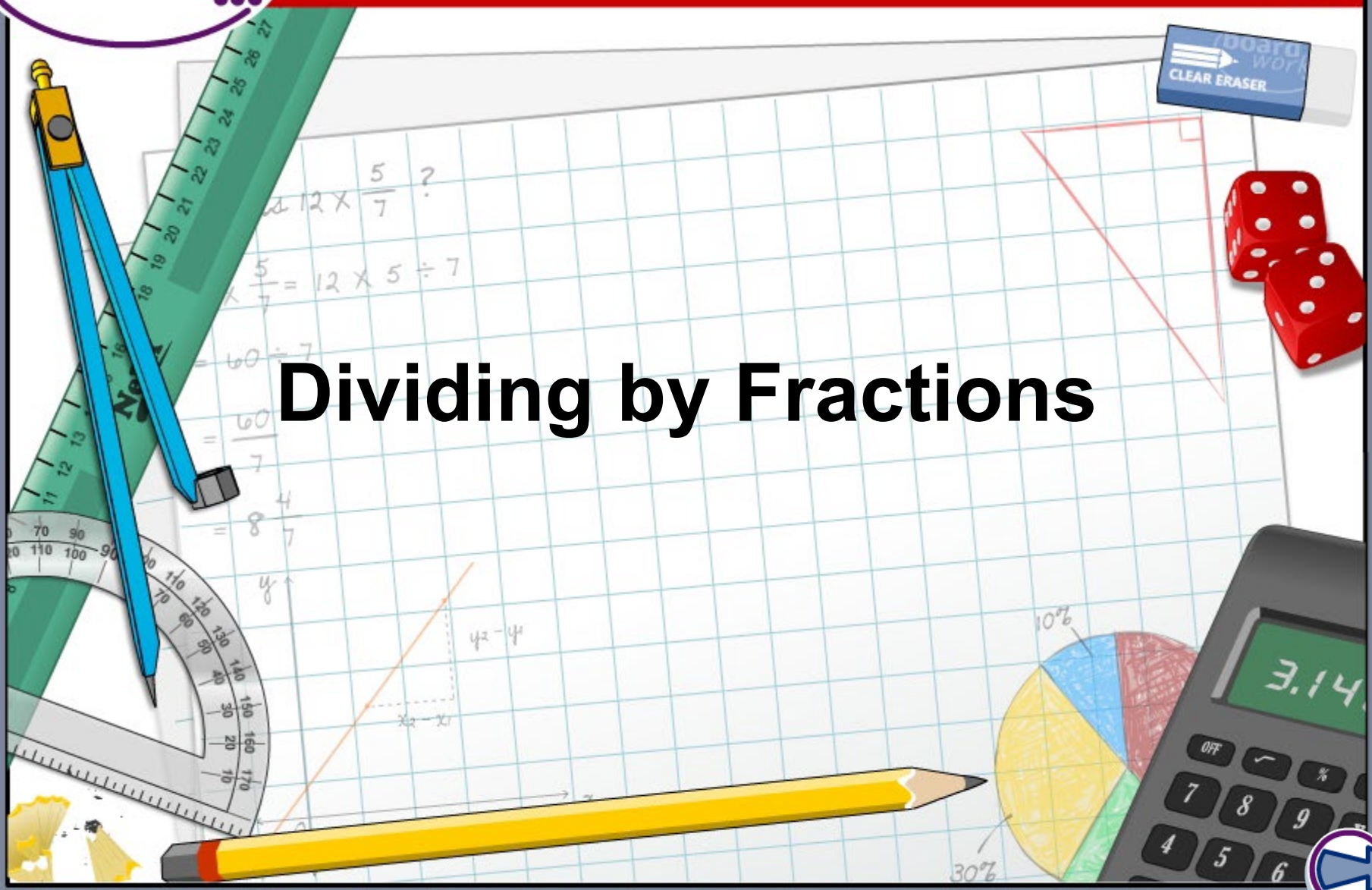


Dividing by Fractions

Information

Common core icons

This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.

Slides containing examples of mathematical modeling are marked with this stamp.

This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These are:

1) Make sense of problems and persevere in solving them.

2) Reason abstractly and quantitatively.

3) Construct viable arguments and critique the reasoning of others.

4) Model with mathematics.

5) Use appropriate tools strategically.

6) Attend to precision.

7) Look for and make use of structure.

8) Look for and express regularity in repeated reasoning.

This icon indicates that the slide contains activities created in Flash. These activities are not editable.

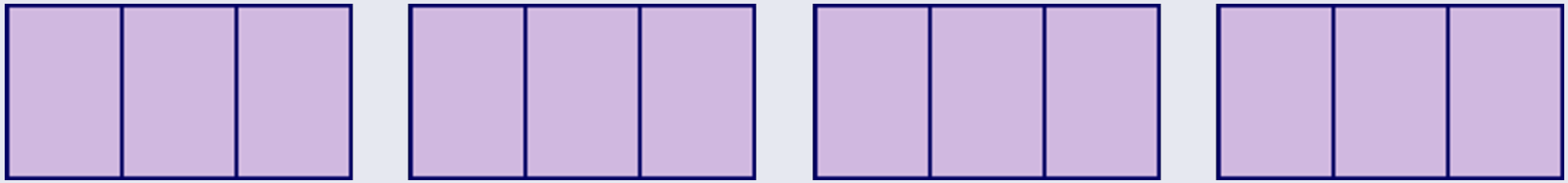
This icon indicates teacher's notes in the Notes field.

Dividing a whole number by a fraction

What is $4 \div \frac{1}{3}$?

$4 \div \frac{1}{3}$ means, "How many thirds are there in 4?".

Here are 4 rectangles:



Let's divide them into thirds.

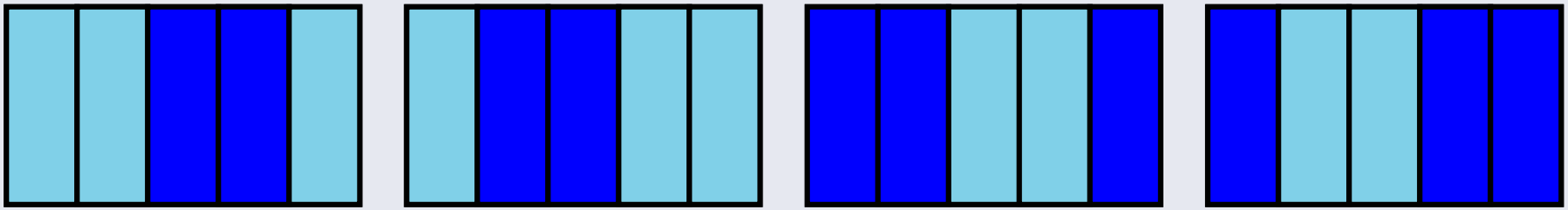
$$4 \div \frac{1}{3} = 12$$

Dividing a whole number by a fraction

What is $4 \div \frac{2}{5}$?

$4 \div \frac{2}{5}$ means, "How many two fifths are there in 4?".

Here are 4 rectangles:



Let's divide them into fifths, and count the number of two fifths.

$$4 \div \frac{2}{5} = 10$$

Multiplying and dividing by fractions

Multiplying and dividing are inverse operations.

When we multiply by a fraction we:

multiply by the numerator
and
divide by the denominator

When we divide by a fraction we:

divide by the numerator
and
multiply by the denominator

Dividing a whole number by a fraction

What is $6 \div \frac{3}{4}$?

$6 \div \frac{3}{4}$ means, "How many three quarters are there in six?".

$$6 \div \frac{1}{4} = 6 \times 4 = 24$$

So:

$$6 \div \frac{3}{4} = 24 \div 3 = 8$$

We can check this by multiplying.

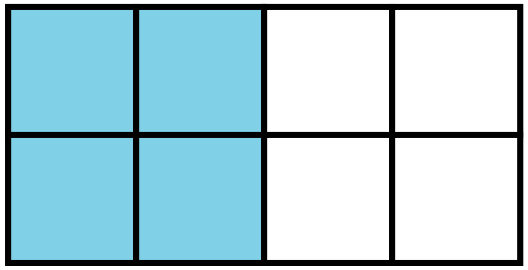
$$8 \times \frac{3}{4} = 8 \div 4 \times 3 = 6$$

Dividing a fraction by a fraction

What is $\frac{1}{2} \div \frac{1}{8}$?

$\frac{1}{2} \div \frac{1}{8}$ means, "How many eighths are there in one half?".

Here is $\frac{1}{2}$ of a rectangle:



Now, let's divide the shape into eighths.

$$\frac{1}{2} \div \frac{1}{8} = 4$$

Dividing a fraction by a fraction

What is $\frac{2}{3} \div \frac{4}{5}$?

To divide by a fraction we multiply by the denominator and divide by the numerator.

$\frac{2}{3} \div \frac{4}{5}$ can be written as $\frac{2}{3} \times \frac{5}{4}$

Swap the numerator and the denominator and multiply.

$$\frac{2}{3} \times \frac{5}{4} = \frac{10}{12}$$

$$= \frac{5}{6}$$

Dividing a fraction by a fraction

What is $3\frac{3}{5} \div \frac{6}{7}$?

Start by writing $3\frac{3}{5}$ as an improper fraction.

$$3\frac{3}{5} = \frac{18}{5}$$

$$\frac{18}{5} \div \frac{6}{7} = \frac{\cancel{18}^{3}}{5} \times \frac{7}{\cancel{6}_{1}}$$

$$= \frac{21}{5}$$

$$= 4\frac{1}{5}$$

You can simplify the calculation by cross-canceling.

Bake sale

Shayna is making cookies for her track team's bake sale. She uses 1/6 of a bag of chocolate chips in each batch. She has 1/3 of a bag left. How many batches can she make?

Dividing by fractions

Figure out the stages to this calculation.
Press the notelets to reveal the hidden values.

$$\frac{5}{12} \div \frac{11}{12} =$$