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### Communicate the Ideas

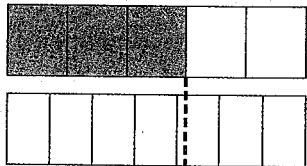
- Anna divided  $\frac{5}{6}$  by  $\frac{1}{2}$  and stated that the quotient is  $\frac{5}{12}$ .
  - What was Anna's mistake?
  - What is the correct quotient? Use a diagram to show how you know.

- Mike carried out the division  $\frac{3}{4} \div \frac{2}{3}$  as follows.

$$\begin{aligned} \frac{3}{4} \div \frac{2}{3} &= \frac{4}{3} \times \frac{2}{3} \\ &= \frac{8}{9} \end{aligned}$$

Do you agree with Mike's method and answer? Explain.

- Explain how the diagram shows that the quotient of  $\frac{3}{5} \div \frac{1}{7}$  is between 4 and 5.



- Does  $2\frac{1}{2} \div 1\frac{1}{2}$  equal  $1\frac{1}{2} \div 2\frac{1}{2}$ ?
- If the quotients in part a) are not equal, how are they related?

### Check Your Understanding

#### Practise

For help with #5 and #6, refer to Example 1 on page 224.

- Determine each quotient using diagrams.

a) $\frac{5}{8} \div \frac{1}{4}$	b) $\frac{1}{4} \div \frac{1}{3}$
c) $1\frac{1}{2} \div \frac{2}{3}$	d) $2\frac{1}{3} \div \frac{5}{6}$

- Use diagrams to determine each quotient.

a) $\frac{9}{10} \div \frac{1}{5}$	b) $\frac{1}{4} \div \frac{3}{8}$
c) $1\frac{2}{3} \div \frac{1}{2}$	d) $2\frac{3}{4} \div \frac{2}{3}$

For help with #7 to #10, refer to Example 2 on pages 224–225.

- Divide using a common denominator.

a)  $\frac{3}{5} \div \frac{9}{10}$     b)  $1\frac{1}{2} \div \frac{5}{6}$     c)  $3\frac{1}{3} \div 1\frac{5}{6}$

- Divide using multiplication.

a)  $\frac{5}{12} \div \frac{3}{4}$     b)  $4\frac{1}{2} \div 1\frac{1}{4}$     c)  $10 \div 2\frac{1}{2}$

- Divide.

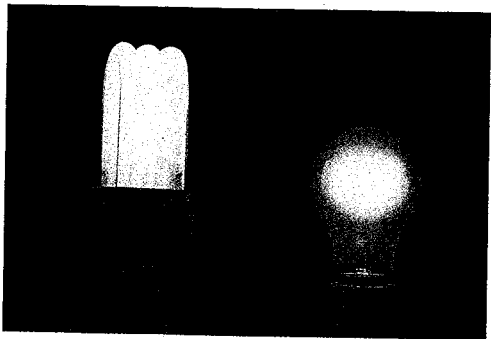
a)  $\frac{3}{4} \div \frac{4}{5}$     b)  $1\frac{2}{3} \div 2\frac{5}{6}$     c)  $12 \div \frac{3}{4}$

10. Divide.

a)  $1\frac{1}{12} \div 2\frac{1}{2}$    b)  $\frac{8}{11} \div \frac{4}{5}$    c)  $1\frac{3}{8} \div 2\frac{3}{4}$

### Apply

For help with #11 to #13, refer to Example 3 on page 225.

11. In a comedy review, each performer has a  $\frac{1}{4}$ -h slot. How many performers are there in a 2-h show?
12. It takes  $2\frac{1}{2}$  scoops of flour to make one cake. How many cakes do 15 scoops of flour make?
13. Three quarters of a can of apple juice fills six glasses. How many glasses will a whole can of apple juice fill?
14. An incandescent light bulb uses about  $4\frac{1}{2}$  times as much energy as a compact fluorescent light bulb to produce the same amount of light. What fraction of the energy used by the incandescent bulb does the fluorescent light bulb use?
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15. Shana and Zack painted their rooms using paint in cans of the same size. Shana used  $1\frac{1}{2}$  cans of paint. Zack used  $2\frac{3}{4}$  cans of paint. How many times as much paint did Zack use as Shana?
16. Of all the land on Earth, about  $\frac{3}{10}$  is in Asia and about  $\frac{3}{25}$  is in South America. How many times as big as South America is Asia?
17. The average wind speed in Calgary is  $\frac{4}{5}$  of the average wind speed in Regina. The average wind speed in Calgary is 16 km/h. What is the average wind speed in Regina?
18. Use examples to explain your answer to each of the following.
- a) Can the reciprocal of a proper fraction be a proper fraction?
  - b) Can the product of two proper fractions be greater than 1?
  - c) Can the quotient of two proper fractions be greater than 1?
19. a) The world's longest river is the Nile in Africa, with a length of 6825 km. This is about  $1\frac{5}{8}$  times as long as the Mackenzie River, which is Canada's longest river.
- a) How long is the Mackenzie River?
  - b) The Mackenzie River is about  $2\frac{1}{10}$  times as long as the Columbia River. How long is the Columbia River?



20. Russia covers about  $\frac{1}{30}$  of the Earth's surface. The area of Russia is about  $1\frac{2}{3}$  times the area of Canada. What fraction of the Earth's surface does Canada cover?

21. Suppose a friend knows how to divide by whole numbers, but not by fractions.

a) How could you use the following pattern to show your friend how to calculate  $4 \div \frac{1}{2}$ ?

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

$$4 \div 4 = 1$$

$$4 \div 2 = 2$$

$$4 \div 1 = 4$$

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

b) Make up a pattern to show your friend how to calculate  $9 \div \frac{1}{3}$ .

22. Write a word problem that you can solve using the expression  $3\frac{3}{4} \div 2\frac{1}{4}$ .

### Extend

23. It took Svend  $9\frac{3}{4}$  min to ski up a slope on a cross-country ski trail and only  $2\frac{1}{4}$  min to ski back down the same slope. How many times as fast did he ski down the slope as he skied up it?



24. The three largest islands in Canada are all north of the Arctic Circle. Baffin Island has about  $2\frac{1}{3}$  times the area of Victoria Island. Baffin Island has about  $2\frac{3}{5}$  times the area of Ellesmere Island. What fraction of the area of Victoria Island is the area of Ellesmere Island?

## MATH LINK

The Prairies ecozone includes the Manitoba Plain and the grasslands of southwest Saskatchewan and southeast Alberta. The wettest part of this ecozone is the Manitoba Plain, which has an average annual precipitation of about 70 cm. This amount of precipitation is  $2\frac{4}{5}$  of the amount in the dry grasslands.

What is the average annual precipitation in these grasslands?

### Did You Know?

The Prairies ecozone contains much of Canada's farmland, but it is vulnerable to droughts.

