Chapter 7: Fractions

Lesson 1 – Modelling Fractions
Learning Goals: Model fractions equal to 1 or greater than 1.

Question:
Use pattern blocks to model each improper fraction. Sketch each fraction.

a) $\frac{11}{6}$ b) $\frac{3}{2}$ c) $\frac{14}{3}$ d) $\frac{4}{3}$

Answer:

a)

b)

c)

d)

At-Home Help

An **improper fraction** is a fraction with a numerator that is greater than its denominator.

For example, $\frac{7}{3}$ is an improper fraction.

In this model, one circle represents one whole. Each whole has 3 parts. 7 parts are shaded to represent $\frac{7}{3}$.

Lesson 2 - Fractions Greater Than 1

Learning Goals: Compare numerators and denominators to interpret fractions.

Question:

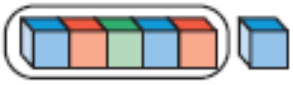
a) Model $\frac{6}{5}$ and $\frac{17}{4}$ using linking cubes. Sketch your models. Circle one whole in each sketch.

b) How many cubes did you use to model the whole in part a)? How did you decide on the number of cubes to use?

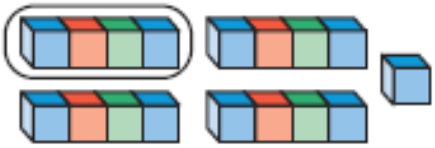
Answer:

a) For example,

$\frac{6}{5}$



$\frac{17}{4}$



b) To show $\frac{6}{5}$, I used 5 cubes in the whole; to show $\frac{17}{4}$, I used 4 cubes in the whole. I looked at the denominator to decide how many cubes to use in each whole

At-Home Help

You can use linking cubes to model improper fractions. For example, this model shows $\frac{5}{2}$.

Notice that each whole contains two cubes.

Lesson 3 – Representing Improper Fractions as Mixed Numbers
Learning Goals: Relate improper fractions to mixed numbers.

Question:

Deanna puts a bucket under a dripping tap to catch the water. In one hour, $\frac{1}{10}$ of the bucket is filled. She uses this amount to estimate the number of buckets of water her family wastes in a day.

a) What improper fraction describes the number of buckets of water that are likely to be filled in 24 h?

b) What mixed number describes the number of buckets of water that are likely to be filled in 24 h?

Answer:

a) $\frac{24}{10}$

b) $2\frac{4}{10}$

At-Home Help

A **mixed number** is a number with a whole number part and a proper fraction part.

For example, $3\frac{1}{4} = 3 + \frac{1}{4}$.

Lesson 5 - Representing Mixed Numbers as Improper Fractions
Learning Goals: Express a mixed number as an equivalent improper fraction.

Question:

a) Represent $3\frac{2}{3}$ and $2\frac{1}{5}$ as improper fractions. Use a model or a diagram.

b) Explain why the two improper fractions have the same numerators but different denominators.

Answer:

a) For example, $3\frac{2}{3} = \frac{11}{3}$

$2\frac{1}{5} = \frac{11}{5}$

b) Both times there are 11 sections shaded. That means the numerators of the improper fractions are 11. But for $\frac{11}{3}$ each section represents $\frac{1}{3}$ and for $\frac{11}{5}$ each section represents $\frac{1}{5}$.

Lesson 6 - Comparing Fractions and Mixed Numbers
Learning Goals: Compare improper fractions and mixed numbers using models and diagrams.

Question:

Oksana skated for $1\frac{5}{6}$ h. Ken skated for $\frac{7}{4}$ h. Who skated longer? Describe your strategy for comparing the times.

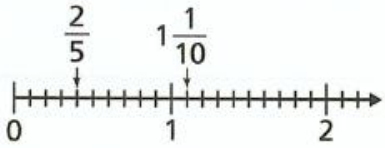
Answer:

Oksana. For example, I could change $\frac{7}{4}$ to the mixed number $1\frac{3}{4}$. Then I would compare $\frac{3}{4}$ and $\frac{5}{6}$ to decide which was greater. I know that $\frac{5}{6}$ is only $\frac{1}{6}$ away from 1 and $\frac{3}{4}$ is $\frac{1}{4}$ away, which is more, so $1\frac{5}{6} > 1\frac{3}{4}$.

At-Home Help

You can use a number line to order or compare improper fractions and mixed numbers.

For example, the number line below is used to compare $\frac{2}{5}$ and $1\frac{1}{10}$.



$1\frac{1}{10}$ is greater than $\frac{2}{5}$.

Lesson 7 - Solving Problems Using Logical Reasoning

Learning Goals: Use logical reasoning to solve mixed number problems and fraction problems.

Question:

Three digits in a row make up the mixed number ▪▪▪. The numerator of the equivalent improper fraction is 23. What could the mixed number be? Explain your thinking.

Answer:

For example, I started by listing improper fractions with a numerator of 23: $\frac{23}{2}$, $\frac{23}{3}$. Then I wrote these as mixed numbers: $10\frac{1}{2}$, $7\frac{2}{3}$. The digits in each of these mixed numbers aren't in a row, so I need to try a greater denominator: $\frac{23}{4}$.

$\frac{23}{4} = 5\frac{3}{4}$ That works.

$\frac{23}{5} = 4\frac{3}{5}$ That works too.

$\frac{23}{6} = 3\frac{5}{6}$ That doesn't work.

The mixed numbers could be $4\frac{3}{5}$ or $5\frac{3}{4}$.

At-Home Help

Follow these steps to solve a problem:

- Understand the problem.
- Make a plan to solve the problem.
- Carry out the plan.
- Look back to make sure your solution makes sense.