

Percents Greater than 100% and Percents Less than 1%



Real-World Link

Plants There are over 220,000 species of plants on Earth. Of those, 590 are carnivorous. Plants such as a Venus Flytrap catch their prey as food.

1. Write the fraction of species of carnivorous plants in simplest form.

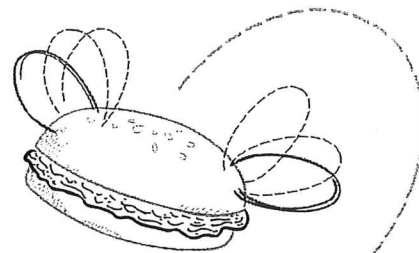
$$\frac{590}{220,000} \div \frac{10}{10} = \frac{59}{22,000}$$

2. Write your answer to Exercise 1 as a decimal rounded to the nearest thousandth. Use division to find your answer.

$$\begin{array}{r} .0026 \\ 22,000 \overline{) 59.0000} \\ \underline{- 44,000} \\ 15,000 \\ \underline{- 13,200} \\ 1,800 \end{array}$$

$$\boxed{.0026} \approx \boxed{.003}$$

Stop. Answer is .00268182, but we can stop here because we are rounding



3. Write your answer to Exercise 2 as a fraction.

$$\frac{3}{1,000}$$

4. **PS Make a Conjecture** Since $0.3 = 30\%$ and $0.03 = 3\%$, what percent is equal to 0.003 ? Explain.

$$\underline{.3\%} \quad \frac{3}{1000} \div \frac{10}{10} = \frac{.3}{100} = .3\%$$

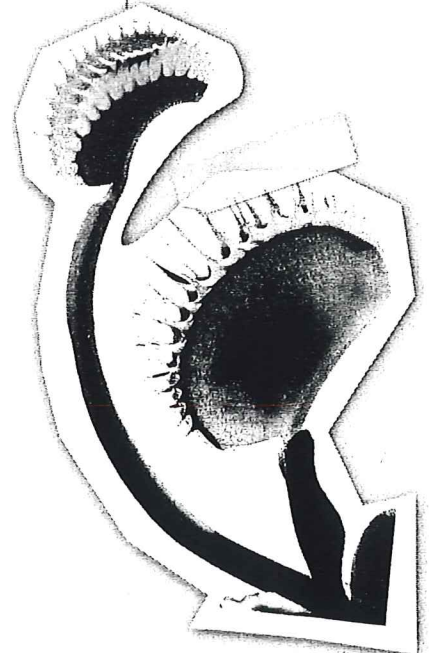


Essential Question

WHEN is it better to use a fraction, a decimal, or a percent?

PS Indiana Academic Standards
Preparation for 6.NS.10

PS Process Standards
1, 3, 4, 5



Which **PS** Process Standards did you use?

Shade the circle(s) that applies.

- | | |
|--|---|
| <input type="checkbox"/> 1 Persevere with Problems | <input type="checkbox"/> 5 Use Math Tools |
| <input type="checkbox"/> 2 Reason Abstractly | <input type="checkbox"/> 6 Attend to Precision |
| <input type="checkbox"/> 3 Construct an Argument | <input type="checkbox"/> 7 Make Use of Structure |
| <input type="checkbox"/> 4 Model with Mathematics | <input type="checkbox"/> 8 Use Repeated Reasoning |

Percents as Decimals and Fractions

Percents greater than 100% or less than 1% can also be written as decimals or as fractions.



Examples

- 1. Write 0.2% as a decimal and as a fraction in simplest form.**

$$0.2\% = 00.2$$

Divide by 100 and remove % symbol.

decimal

$$= 0.002$$

Decimal form

$$= \frac{2}{1,000} \text{ or } \frac{1}{500}$$

Fraction form

- 2. Write 170% as a mixed number in simplest form and as a decimal.**

$$170\% = \frac{170}{100}$$

Definition of percent

170% → decimal

$$= 1\frac{70}{100} \text{ or } 1\frac{7}{10}$$

Mixed number form

170 = 1.7

$$= 1.7$$

Decimal form

Got it? Do these problems to find out.

Write each percent as a decimal and as a mixed number or fraction in simplest form.

a. 0.25%

b. 300%

c. 530%

a. _____

b. _____

c. _____

Show your work.



Example



- 3. Jimmy's savings increased by 250%. Write 250% as a mixed number in simplest form and as a decimal.**

$$250\% = \frac{250}{100}$$

Definition of a percent

$$= 2\frac{50}{100} \text{ or } 2\frac{1}{2}$$

Mixed number form

$$= 2.5$$

Decimal form

So, Jimmy more than doubled his savings.

Got it? Do this problem to find out.

- d. The stock price for a corporation increased by 0.11%. Write 0.11% as a decimal and as a fraction in simplest form.

d. _____

Mixed Numbers and Decimals as Percents

To write a decimal as a percent, multiply by 100 and add a percent sign. To write a mixed number as a percent, first write the mixed number as an improper fraction.

Example

4. Write $1\frac{1}{4}$ as a percent.

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

Write $1\frac{1}{4}$ as an improper fraction.

$$\frac{5}{4} = \frac{\square}{100}$$

Find an equivalent fraction.

$$\begin{array}{l} \times 25 \curvearrowright \\ \frac{5}{4} = \frac{125}{100} \end{array}$$

Since $4 \times 25 = 100$, multiply 5 by 25 to find an equivalent fraction.

$$\times 25 \curvearrowleft$$

So, $1\frac{1}{4}$ is $\frac{125}{100}$ or 125%.

OR \rightarrow

$$.25 + 1 = 1.25$$

$$4 \overline{) 11.00}$$

$$\begin{array}{r} 2 \\ \underline{8} \\ 30 \\ \underline{20} \\ 100 \\ \underline{100} \\ 0 \end{array}$$

1.25 = 125%

Alternative Method

$$1 = 100\%$$

$$\frac{1}{4} = 25\%$$

So, $1\frac{1}{4} = 125\%$.

- ① Ignore whole number.
- ② Use division to turn fraction to decimal.
- ③ Add on whole #.
- ④ Move the decimal 2 times right.

Show your work. \rightarrow

Got it? Do these problems to find out.

Write each mixed number as a percent.

e. $2\frac{9}{10}$

f. $3\frac{2}{5}$

e. _____

f. _____

Examples

5. Write 1.68 as a percent.

$$\begin{array}{l} 1.68 = 1.68 \\ = 168\% \end{array}$$

Multiply by 100.
Add % symbol.

percent

$$1.68 \rightarrow 168\%$$

Two times right!

6. Write 0.0075 as a percent.

$$\begin{array}{l} 0.0075 = 0.0075 \\ = 0.75\% \end{array}$$

Multiply by 100.
Add % symbol.

STOP and Reflect

Is the decimal 6.7 equal to 67%? Explain below.

g. _____

h. _____

i. _____

Got it? Do these problems to find out.

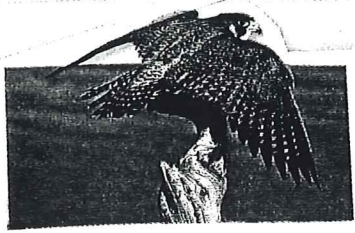
g. 2.5

h. 0.004

i. 0.0016



Example



7. **STEM** The cheetah is the fastest land mammal in the world. The peregrine falcon is the fastest bird in the world. Its speed is 2.1 times as fast as the cheetah. Write this number as a percent.

$$2.1 = 2.10 \quad \text{Multiply by 100.}$$

$$= 210\% \quad \text{Add \% symbol.}$$

The peregrine falcon's speed is 210% of the cheetah's speed.

Got it? Do this problem to find out.

- j. **STEM** The slowest land mammal is the sloth. Its speed is about 0.0016 that of a cheetah. Write this number as a percent.

j. _____

Show your work.

Guided Practice



Write each percent as a decimal and as a mixed number or fraction in simplest form. (Examples 1–3)

1. $325\% =$ _____

2. $480\% =$ _____

3. $0.6\% =$ _____

Show your work.

Write each mixed number or decimal as a percent. (Examples 4–6)

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

5. $0.0015 =$ _____

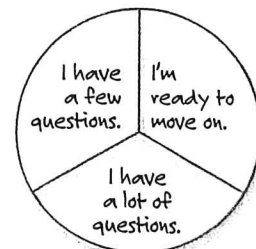
6. $2.75 =$ _____

7. A manufacturing company finds that 0.0019 of the light bulbs it makes are defective. Write this as a percent. (Example 7) _____

8. **Q Building on the Essential Question** How are percents greater than 100% used in real-world contexts?

Rate Yourself!

Are you ready to move on?
Shade the section that applies.



For more help, go online to access a Personal Tutor.





Independent Practice

Write each percent as a decimal and as a mixed number or fraction in simplest form. (Examples 1–3)

1. 350% = _____ | 2. 600% = _____ | 3. 0.15% = _____ | 4. 0.55% = _____

Show your work.

Write each mixed number as a percent. (Example 4)

5. $2\frac{1}{2}$ = _____ | 6. $9\frac{3}{4}$ = _____ | 7. $4\frac{1}{5}$ = _____ | 8. $7\frac{3}{10}$ = _____

Write each decimal as a percent. (Examples 5 and 6)

9. 8.5 = _____ | 10. 2.64 = _____ | 11. 0.009 = _____ | 12. 0.0034 = _____

13 The size of a large milkshake is 1.4 times the size of a medium milkshake. Write 1.4 as a percent. (Example 7)

14. STEM Fresh water from lakes accounts for only 0.001 of the world's water supply. Write this decimal as a percent. (Example 7)

15. In a recent year, the United States Census Bureau reported that 0.3% of the population in the United States was Japanese. Write this percent as a decimal and as a fraction. Then interpret its meaning as a ratio of the United States population.

16. Adrienne answered all 21 multiple-choice questions correctly on her science test. If her teacher decided to let one of the questions count as a bonus, worth the same number of points as the other problems on the test, what was Adrienne's test score? Write your answer as a decimal and as a percent.

• decimal: _____

• fraction: _____