Exploring Percents

At Home
At School
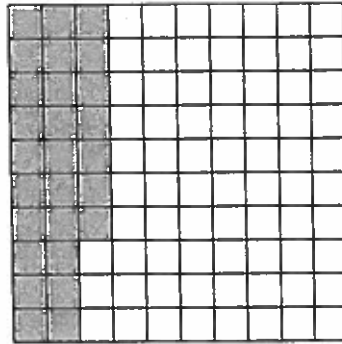
Quick Review

This hundredths grid has 100 small squares.
Each square represents $\frac{1}{100}$ of the grid.
Twenty-seven squares are shaded.
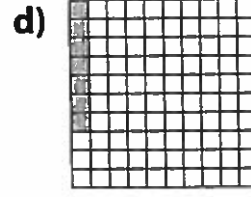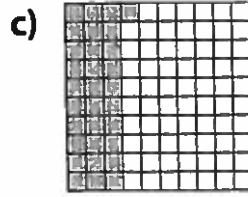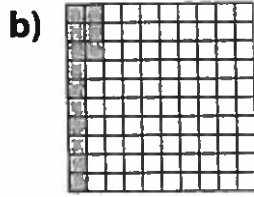
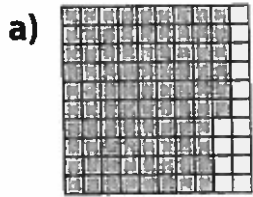

You can describe the shaded part of the grid.

➤ 27 out of 100 squares are shaded.

➤ $\frac{27}{100}$ of the grid is shaded.

➤ 0.27 of the grid is shaded.

➤ 27% of the grid is shaded.

Percent means "per hundred" or "out of 100."

This is a **percent** symbol. You read 27% as 27 percent.

Try These

1. Write a fraction with hundredths, a decimal, and a percent to describe the shaded part of each grid.
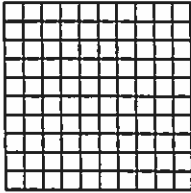
   a)   b)   c)   d)

   _____   _____   _____   _____

2. Write a fraction with hundredths, a decimal, and a percent to describe the unshaded part of each grid in question 1.
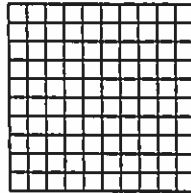
   a) _____   b) _____   c) _____   d) _____

1. Colour each hundredths grid to show the percent.

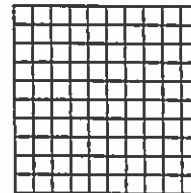   **a)** 42%   **b)** 75%   **c)** 6%
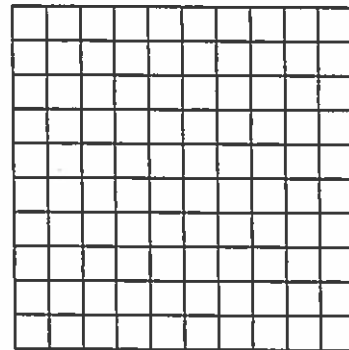
2. **a)** Use the hundredths grid. Colour 35% blue,
      7% red, 40% green, and the rest orange.

   b) Write a fraction and a decimal
      to describe each colour.

      blue _____   red _____

      green _____   orange _____

   c) What percent is orange? _____

3. Write as a percent and as a decimal.

   a) $\frac{43}{100}$ _____ _____   **b)** $\frac{16}{100}$ _____ _____   **c)** $\frac{100}{100}$ _____ _____

   d) $\frac{3}{100}$ _____ _____   **e)** $\frac{82}{100}$ _____ _____   **f)** $\frac{11}{100}$ _____ _____

4. Write as a fraction and as a decimal.

   a) 19% _____ _____   **b)** 1% _____ _____   **c)** 93% _____ _____

   d) 7% _____ _____   **e)** 100% _____ _____   **f)** 47% _____ _____

Stretch Your Thinking . . . .

Draw a rectangle and an oval around groups of
Xs so that all of the following statements are true.
- 64% of the Xs are not inside either figure.
- 8% of the Xs are inside both figures.
- 20% of the Xs are inside the rectangle only.
- 8% of the Xs are inside the oval only.

```
X X X X X X X X X X X
X X X X X X X X X X X
X X X X X X X X X X X
X X X X X X X X X X X
X X X X X X X X X X X
X X X X X X X X X X X
X X X X X X X X X X X
X X X X X X X X X X X
X X X X X X X X X X X
X X X X X X X X X X X
```
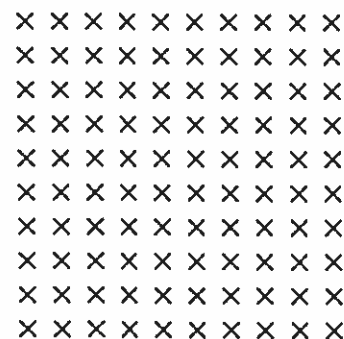
PERCENTS

Greetings,

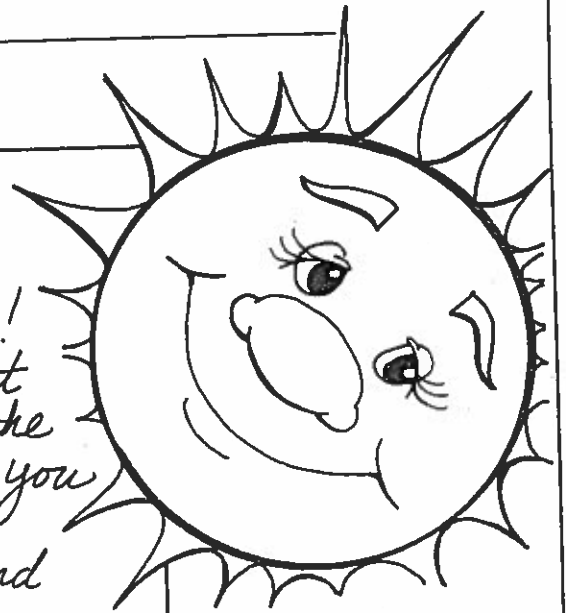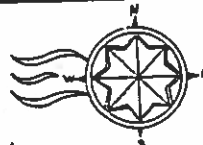*I'm in the midst of a heat wave! Today's temperature was the highest ever recorded, 134° F. This place is the lowest point in North America. Do you know where I am?*

Professor Ben Around

To find out, change each decimal to a percent. Write the matching letter in the blank above the percent. Shade in each box that is less than one half. The remaining letters spell the answer. Write the letters in the blanks below.

1. 0.1 = _____% **B**   2. 0.71 = _____% **L**   3. 0.51 = _____% **Y**

4. 0.62 = _____% **A**   5. 0.95 = _____% **T**   6. 0.35 = _____% **G**

7. 0.11 = _____% **I**   8. 0.6 = _____% **D**   9. 0.88 = _____% **A**

10. 0.18 = _____% **J**   11. 0.01 = _____% **Q**   12. 0.03 = _____% **P**

13. 0.9 = _____% **E**   14. 0.55 = _____% **V**   15. 0.07 = _____% **O**

16. 0.2 = _____% **K**   17. 0.85 = _____% **L**   18. 0.79 = _____% **E**

19. 0.43 = _____% **M**   20. 0.23 = _____% **N**   21. 0.72 = _____% **H**

ANSWER: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

DECODER

20%	60%	11%	3%	90%	35%	62%
18%	95%	7%	72%	10%	55%	1%
88%	71%	23%	85%	43%	79%	51%

GA1319

Why do birds fly south in winter?

DIRECTIONS

Solve the following problems and match your answers to the answers in the **Legend**. Then record the corresponding letter of the correct answer in the rectangles at the bottom to answer the riddle.
Note: The problem numbers match the numbered rectangles.

A 78%	**A** 33.9%	**T** 30%	**C** 60.3%	**I** 2.5%	**A** 81%
F 20%	**S** 4.5%	**T** 66%	**O** 44%	**O** 6.2%	**B** 90%
E 37%	**W** 100%	**O** 14%	**L** 0.3%	**S** 51%	
U 21%	**E** 1%	**T** 10%	**K** 99%	**R** 4%	**LEGEND**

Write each decimal as a percent:

① 0.44 = _____ ② 0.21 = _____ ③ 0.04 = _____ ④ 0.78 = _____

⑤ 0.01 = _____ ⑥ 0.99 = _____ ⑦ 0.045 = _____ ⑧ 0.2 = _____

⑨ 0.66 = _____ ⑩ 0.1 = _____ ⑪ 0.81 = _____ ⑫ 0.37 = _____

⑬ 1.00 = _____ ⑭ 0.062 = _____ ⑮ 0.339 = _____ ⑯ 0.9 = _____

⑰ 0.14 = _____ ⑱ 0.51 = _____ ⑲ 0.603 = _____ ⑳ 0.025 = _____

㉑ 0.3 = _____ ㉒ 0.003 = _____

16	5	19	15	2	7	12	20	9	18	21	1	17	8	11	3	10	14	13	4	22	6

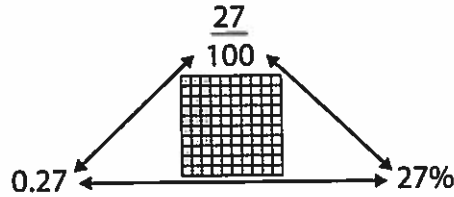**Skill:** Converting between decimals and percents

Relating Fractions, Decimals, and Percents

Quick Review

At Home
At School

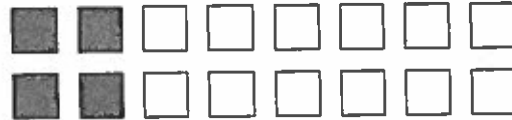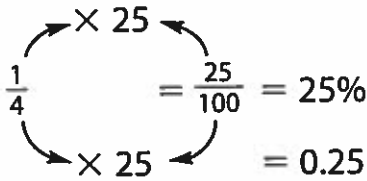Fractions, decimals, and percents are 3 ways to describe parts of a whole.

$\dfrac{27}{100}$

0.27 ← → 27%

➤ $\dfrac{3}{10}$ of this shape is shaded.

$$\dfrac{3}{10} \xrightarrow{\times 10} = \dfrac{30}{100} = 30\%$$
$$\xrightarrow{\times 10} = 0.30$$
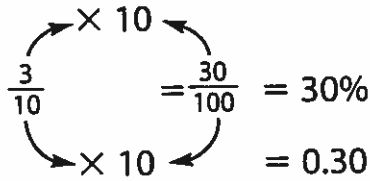
30% of the shape is shaded.

➤ $\dfrac{1}{4}$ of the squares are shaded.

$$\dfrac{1}{4} \xrightarrow{\times 25} = \dfrac{25}{100} = 25\%$$
$$\xrightarrow{\times 25} = 0.25$$

25% of the squares are shaded.

Try These

1. Write each fraction as a percent and as a decimal.

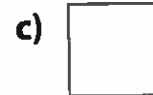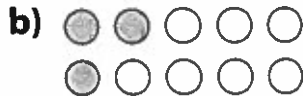   a) $\dfrac{9}{100}$ _____ _____

   b) $\dfrac{7}{10}$ _____ _____

   c) $\dfrac{4}{25}$ _____ _____

   d) $\dfrac{1}{5}$ _____ _____

   e) $\dfrac{7}{50}$ _____ _____

   f) $\dfrac{11}{20}$ _____ _____

2. What percent is shaded?

   a) _____

   b) _____

   c) _____
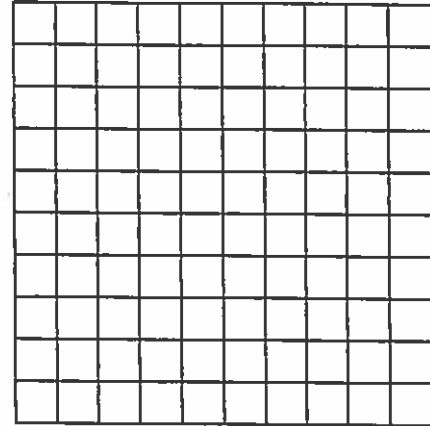
1. **a)** Use the hundredths grid to make a design.
   Follow these rules:

   ➤ You can use only red, black, green, and blue.

   ➤ You must colour at least $\frac{7}{10}$ of the squares.

   ➤ You must use:
   • red for at least 6% of the squares.
   • black for at least 5% of the squares.
   • green and blue together for at least 0.4 of the squares.

   b) Complete the chart to describe the colours in your design.

Colour	Red	Black	Green	Blue	No Colour
Number of Squares					
Fraction					
Decimal					
Percent of Grid					

   c) What is the greatest percent of blank squares you could have in your design? Explain.

   _____

   _____

   d) What is the sum of your decimals? _____ Percents? _____

   What do you think the sum of your fractions would be? _____

What percent of Canada's 10 provinces begin with a vowel? With a consonant? Explain.

_____

_____

NS6-64 Percentages

A **percentage** is a ratio that compares a number to 100.

The term "percent" means "per 100" or "for every 100" or "out of 100." For example, 84% on a test means 84 out of 100.

You can think of a percentage as a short form for a fraction with denominator 100. Example: $45\% = \dfrac{45}{100}$

1. Write the percentage as a fraction.

   a) 7%   b) 92%   c) 5%   d) 15%

   e) 50%   f) 100%   g) 2%   h) 17%

2. Write the fraction as a percentage.

   a) $\dfrac{2}{100}$ b) $\dfrac{31}{100}$ c) $\dfrac{52}{100}$ d) $\dfrac{100}{100}$

   e) $\dfrac{17}{100}$ f) $\dfrac{88}{100}$ g) $\dfrac{7}{100}$ h) $\dfrac{1}{100}$

3. Write the decimal as a fraction and then a percentage.

   a) $0.72 = \dfrac{72}{100} = 72\%$ b) $0.27 =$ c) $0.04 =$

4. Write the fraction as a percentage by first changing it to a fraction with denominator 100.

   a) $\dfrac{3 \times 20}{5 \times 20} = \dfrac{60}{100} = 60\%$ b) $\dfrac{2}{5}$

   c) $\dfrac{4}{5}$ d) $\dfrac{1}{4}$

   e) $\dfrac{3}{4}$ f) $\dfrac{1}{2}$

   g) $\dfrac{3}{10}$ h) $\dfrac{7}{10}$

   i) $\dfrac{17}{25}$ j) $\dfrac{17}{20}$

   k) $\dfrac{3}{25}$ l) $\dfrac{19}{20}$
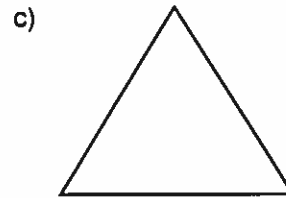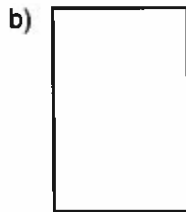
   m) $\dfrac{23}{50}$ n) $\dfrac{47}{50}$

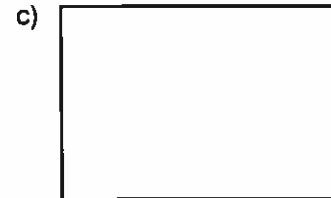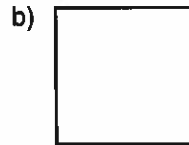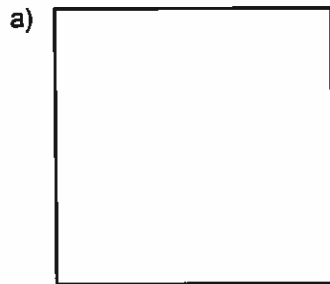# NS6-65 Visual Representations of Percentages

1. Fill in the chart.

Picture				
Fraction	$\dfrac{23}{100}$	$\dfrac{}{100}$	$\dfrac{45}{100}$	$\dfrac{}{100}$
Decimal	0.23	0.___	0.___	0.81
Percentage	23%	63%	___%	___%

Use a ruler for Questions 2 to 4.

2. Shade 50% of the shape.

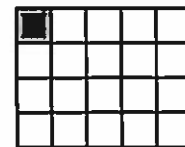a) b) c)

3. Shade 25% of the box.

a) b) c)

4. Colour 50% of the rectangle blue, 40% red, and 10% green.

5. a) Write a fraction for the shaded part: $\dfrac{}{20}$

   b) Write the fraction with a denominator of 100: ——

   c) Write a decimal and a percentage for the shaded part: _____ _____

Why was the baby cow a little bit hyper?

LEGEND

- **N** $\frac{1}{20}$
- **D** $\frac{12}{25}$
- **T** $\frac{3}{5}$
- **O** $\frac{77}{100}$
- **H** $\frac{31}{50}$
- **M** $\frac{17}{20}$
- **H** $\frac{33}{100}$
- **A** $\frac{7}{100}$
- **L** $\frac{41}{50}$
- **F** $\frac{13}{20}$
- **C** $\frac{81}{100}$
- **U** $\frac{1}{5}$
- **E** $\frac{3}{25}$
- **C** $\frac{9}{10}$
- **D** $\frac{1}{50}$
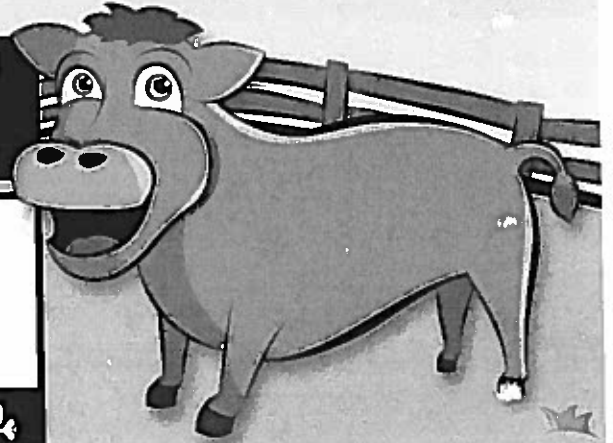- **A** $\frac{3}{4}$
- **E** $\frac{9}{25}$
- **H** $\frac{3}{20}$
- **O** $\frac{11}{50}$
- **E** $\frac{1}{4}$
- **I** $\frac{9}{20}$

Write each percent as a fraction in simplest form:

1. 22% = _____
2. 45% = _____
3. 33% = _____
4. 62% = _____

5. 82% = _____
6. 20% = _____
7. 15% = _____
8. 48% = _____

9. 5% = _____
10. 77% = _____
11. 36% = _____
12. 2% = _____

13. 90% = _____
14. 65% = _____
15. 12% = _____
16. 81% = _____

17. 75% = _____
18. 60% = _____
19. 7% = _____
20. 25% = _____

21. 15% of the pencils sold at the store are mechanical. What fraction of the pencils are not mechanical?

[ ][ ]'[ ] [ ][ ][ ] [ ][ ][ ] [ ][ ][ ][ ] [ ][ ][ ][ ][ ]-[ ][ ][ ][ ]
7 15 12   3 17 8   18 10 1   21 6 16 4   13 19 5 14   11 2 9 20

Skill: Converting percents to fractions