Worksheet - Percentages

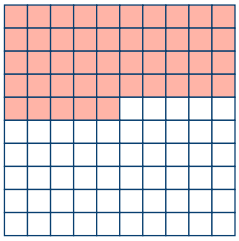
Year: Year 5 · 21

Show your working.

Question 1

Question 1 – Hundred-squares *(Section A · Practice)*

The grid below has 100 squares. Some are shaded.



a. Write the shaded part as a percentage.
b. Write the shaded part as a fraction in its simplest form.
c. Write the shaded part as a decimal.
d. What percentage of the grid is not shaded?

Question 2

Question 2 – Percentages to fractions and decimals *(Section A · Practice)*

Write each percentage as a fraction in its simplest form and as a decimal.

a. 45%
b. 60%
c. 8%
d. 35%
e. 90%

Question 3

Question 3 – Changing to percentages *(Section A · Practice)*

Write each as a percentage.

a. $\frac{7}{100}$
b. 0.6
c. 0.05
d. $\frac{3}{10}$
e. $\frac{1}{4}$
f. $\frac{4}{5}$

Question 4

Question 4 – Fractions with denominator 20, 25 and 50 *(Section A · Practice)*

Write each fraction as a percentage. Find the number to multiply the denominator by to make 100.

a. $\frac{3}{20}$
b. $\frac{7}{25}$
c. $\frac{9}{50}$
d. $\frac{13}{20}$

Question 5

Question 5 – Order them *(Section A · Practice)*

Write these in order, smallest first: $\frac{3}{5}$, 0.58, 62%, $\frac{1}{2}$, 0.7.

Question 6

Question 6 – Percentages of amounts *(Section A · Practice)*

Work out each answer.

a. 50% of 80
b. 25% of 60
c. 10% of 350
d. 20% of 45
e. 75% of 40
f. 30% of 90

Question 7

Question 7 – Phone battery *(Section B · Real-life practice)*

Jess looks at her phone at 8 am. The battery shows 84%. By lunchtime it shows 39%.

a. What percentage of the battery is empty at 8 am?
b. How many percentage points did the battery lose between 8 am and lunchtime?
c. Write the lunchtime charge as a decimal.
d. Jess charges the phone and the battery goes up by 45 percentage points. What does the battery show now?

Question 8

Question 8 – Sale at the sports shop *(Section B · Real-life practice)*

A sports shop has a sale. Trainers cost £48, a football costs £20 and a tracksuit costs £60.

a. Trainers are 25% off. How much is taken off? What is the sale price?
b. The football is 10% off. What is the sale price?
c. The tracksuit is 50% off. What is the sale price?
d. Mia buys all three items at the sale prices. How much does she pay?

Question 9

Question 9 – Test scores *(Section B · Real-life practice)*

Four friends took different spelling tests. The tests had different numbers of questions.

Pupil	Score
Ali	18 out of 20
Beth	21 out of 25
Chen	40 out of 50
Dina	9 out of 10

a. Change each score to a percentage.
b. Who got the highest percentage?
c. Who got the lowest percentage?
d. Put the four pupils in order, highest score first.

Question 10

Question 10 – Walking to school *(Section B · Real-life practice)*

There are 120 children in Year 5 and Year 6 at Hillside School. 35% of them walk to school, 25% come by bus, 10% cycle and the rest come by car.

a. How many children walk to school? (First find 10% of 120.)
b. How many children come by bus?
c. What percentage of the children come by car?
d. How many children come by car?
e. Write the percentage who cycle as a fraction in its simplest form.

Question 11

Question 11 – The football season *(Section B · Real-life practice)*

The Westfield Wanderers play 20 matches in a season. They win 60% of their matches, draw 25% and lose the rest.

a. How many matches do they win?
b. How many matches do they draw?
c. What percentage of the matches do they lose? How many matches is that?
d. They get 3 points for a win and 1 point for a draw. How many points do they get altogether?

Question 12

Question 12 – Saving pocket money *(Section B · Real-life practice)*

Ravi gets £15 a week in pocket money. He saves 20% of it and spends 40% on sweets and comics. The rest he gives to a charity box.

a. How much does he save each week?
b. How much does he spend each week?
c. What percentage does he give to charity? How much is that?
d. After 10 weeks, how much has he saved?

Question 13

Question 13 – Orange squash *(Section B · Real-life practice)*

A bottle of orange squash holds 500 ml. It is 20% orange juice and the rest is water and sugar.

a. How many millilitres of orange juice are in the bottle?
b. What percentage of the squash is water and sugar?
c. How many millilitres of water and sugar are there?
d. Another bottle is 25% orange juice and holds 400 ml. Which bottle has more orange juice?

Question 14

Question 14 – Favourite sports *(Section B · Real-life practice)*

Mr Dean asks 40 children for their favourite sport.

Sport	Number of children
Football	16
Swimming	10
Tennis	6
Gymnastics	8

a. What percentage chose football? (Hint: 40 × 2.5 = 100, or find 10% of 40 first.)
b. What percentage chose swimming?
c. What percentage chose tennis or gymnastics?
d. Check that your percentages add up to 100%.

Question 15

Question 15 – The sale on the shelves *(Section C · Problem solving)*

A shop has a sale. The table shows the usual price and the reduction.

Item	Usual price	Reduction
School bag	£40	25%
Pencil case	£12	50%
Calculator	£30	10%
Lunch box	£15	20%

a. Work out the amount taken off each item.
b. Work out the sale price of each item.
c. Zoe buys a school bag and a calculator. How much does she pay?
d. Which item has the biggest reduction in pounds and which has the biggest reduction in percentage?
e. Zoe says: "50% off a £12 pencil case saves me more than 20% off a £15 lunch box." Is she right? Explain.

Question 16

Question 16 – Class survey *(Section C · Problem solving)*

A class of 25 children vote for their favourite pet. The results are shown in the table.

Pet	Votes
Dog	10
Cat	7
Rabbit	3
Fish	5

a. Explain why multiplying by 4 turns a fraction out of 25 into a percentage.
b. Write the votes for each pet as a percentage of the class.
c. Which pet got exactly $\frac{2}{5}$ of the votes? Write $\frac{2}{5}$ as a percentage.
d. The teacher says that more than half the class voted for dogs or fish. Is she right?

Question 17

Question 17 – Fruit salad *(Section C · Problem solving)*

Chef Ana makes a fruit salad with 60 pieces of fruit. 40% of the pieces are apple, 25% are banana and the rest are grapes.

a. How many pieces of apple are there?
b. How many pieces of banana are there?
c. What percentage are grapes? How many grape pieces is that?
d. She adds 20 more grapes. What fraction of the salad is now grapes? Write it in its simplest form.
e. What percentage of the salad is grapes after adding the extra grapes? Give your answer to the nearest whole number.

Question 18

Question 18 – Battery use *(Section C · Problem solving)*

A tablet battery goes down during the day. The table shows the charge at different times.

Time	Charge
8 am	100%
10 am	85%
12 noon	60%
2 pm	45%
4 pm	20%

a. How many percentage points did the battery lose between 8 am and 10 am?
b. Between which two times did the battery lose the most? How much?
c. Write the 4 pm charge as a fraction in its simplest form.
d. The tablet turns off when the battery reaches 5%. If it loses the same as between 2 pm and 4 pm in the next two hours, will it still be on at 6 pm? Explain.

Question 19

Question 19 – Which is biggest? *(Section C · Problem solving)*

Three friends each have a share of a pizza. Anna eats $\frac{3}{5}$ of her pizza, Ben eats 0.65 of his pizza and Cara eats 62% of her pizza. The pizzas are the same size.

a. Write each share as a percentage.
b. Who ate the biggest share? Who ate the smallest?
c. Write the three shares in order, smallest first.
d. Dan eats $\frac{7}{10}$ of a pizza. Who ate less than Dan?
e. Eve says that $\frac{3}{4}$ of a pizza is the same as 0.75 and 70%. Is she right?

Question 20

Question 20 – Savings account *(Section C · Problem solving)*

Mia has £200 in a savings jar. She spends 10% on a book, 15% on a game and puts 25% into a gift fund for her sister.

a. How much does she spend on the book?
b. How much on the game? (Use 10% and 5%.)
c. How much does she put in the gift fund?
d. How much money is left in the jar? What percentage of her money is that?
e. She says she has less than half of her money left. Is she right? Explain.

Question 21

Question 21 – Challenge: up and down *(Section D · Challenge)*

A shop raises the price of a computer game by 10%, then lowers the new price by 10%. The game costs £100 to start with.

a. Work out the price after the 10% increase.
b. Work out the price after the 10% decrease.
c. Is the final price equal to the starting price? Explain.
d. A different game costs £50. Do the same steps. What is the final price?