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Introducing Percentages Key Stage 2

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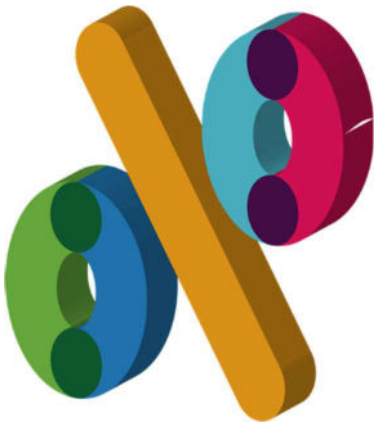

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Worksheet 1: What is a Percentage?

Explanation:

A **percentage** shows **how much out of 100**.

- 100% means **all** of something.
- 50% means **half** of something.
- 25% means **a quarter** of something.
- 75% means **three quarters** of something.

Example 1: If there are 12 pencils and you use 25%, that is 12 ÷ 4 = 3 pencils.
Example 2: If there are 8 apples and you eat 50%, that is 8 ÷ 2 = 4 apples.

Tip:

- To find a percentage of a number, divide depending on the fraction it represents:
    - 50% = half
    - 25% = a quarter
    - 75% = three quarters
    - 100% = all

1. What is 50% of 10? _____
2. What is 50% of 20? _____
3. What is 100% of 8? _____
4. What is 25% of 12? _____
5. What is 75% of 16? _____
6. What is 50% of 6? _____
7. What is 25% of 8? _____
8. What is 100% of 5? _____
9. What is 75% of 12? _____
10. What is 50% of 14? _____

Worksheet 2: Finding a Percentage of a Number

Step 1:

Find 10% of the number.
Divide the number by 10.

Step 2:

Once you know 10% of the number, you can find other percentages by counting 10% as many times as you need.

10% = 1 × 10%

20% = 2 × 10%

30% = 3 × 10%

40% = 4 × 10%

50% = 5 × 10%

1. What is 10% of 50? _____
2. What is 20% of 60? _____
3. What is 40% of 120? _____
4. What is 50% of 28? _____
5. What is 80% of 20? _____
6. A shop has 40 pencils. 10% are red. How many pencils are not red? _____
7. A class has 30 children. 20% are absent. How many children are in class? _____
8. What is 10% of 120? _____
9. What is 90% of 80? _____
10. A basket has 20 apples. 10% are ripe. How many apples are not ripe? _____

Worksheet 3: Finding the Whole from a Percentage

How to Find the Whole Number from a Percentage

Step 1: Know what the percentage means

25% means $\frac{1}{4}$ of the total

50% means $\frac{1}{2}$of the totalType equation here.

10% means $\frac{1}{10}$ of the total

20% means $\frac{1}{5}$ of the total

Step 2: Multiply to find the total

If $\frac{1}{4}$ = **6**,then the total = 6 × 4 = 24

If $\frac{1}{2}$ = **8**, then the total = 8 × 2 = 16

If $\frac{1}{5}$= **8**, then the total = 8 × 5 = 40

1. 50% of a number is 6. What is the number? _____
2. 25% of a number is 5. What is the number? _____
3. 10% of a number is 7. What is the number? _____
4. 75% of a number is 12. What is the number? _____
5. 50% of a number is 14. What is the number? _____
6. 20% of a number is 8. What is the number? _____
7. 25% of a number is 6. What is the number? _____
8. 50% of a number is 10 What is the number? _____
9. 10% of a number is 9. What is the number? _____
10. 70% of a number is 70. What is the number? _____

Worksheet 4: Percentage Increase

Explanation:

A **percentage increase** shows that a number gets **bigger** by a certain percentage.

Step 1: Find the percentage of the number.
Step 2: Add that amount to the original number.

Example 1:
A toy costs £20. The price increases by 10%.

Step 1: Find 10% of £20 → 20 ÷ 10 = £2

Step 2: Add it to the original price → 20 + 2 = **£22**

Example 2:
A book costs £40. The price increases by 25%.

Step 1: Find 25% of £40 → 40 ÷ 4 = £10

Step 2: Add it → 40 + 10 = **£50**

Percentage increase = original number + percentage of original number

1. A bag costs £30. It increases by 10%. What is the new price? _____
2. A toy costs £50. It increases by 20%. What is the new price? _____
3. A chocolate bar costs 80p. It increases by 25%. What is the new price? _____
4. A notebook costs £12. It increases by 50%. What is the new price? _____
5. A pair of shoes costs £40. It increases by 10%. What is the new price? _____
6. A school trip costs £60. It increases by 25%. How much does it cost now? _____
7. A sandwich costs £5. It increases by 20%. What is the new price? _____
8. A video game costs £36. It increases by 50%. What is the new price? _____
9. A bike costs £80. It increases by 10%. What is the new price? _____
10. A bottle of juice costs £4. It increases by 25%. What is the new price? _____

Worksheet 5: Percentage Decrease

Explanation:

A **percentage decrease** shows that a number gets **smaller** by a certain percentage.

Step 1: Find the percentage of the number.
Step 2: Subtract that amount from the original number.

Example 1:
A toy costs £20. The price decreases by 10%.

Step 1: Find 10% of £20 → 20 ÷ 10 = £2

Step 2: Subtract it → 20 − 2 = **£18**

Example 2:
A book costs £40. The price decreases by 25%.

Step 1: Find 25% of £40 → 40 ÷ 4 = £10

Step 2: Subtract it → 40 − 10 = **£30**

Percentage decrease = original number − percentage of original number

1. A bag costs £30. It is reduced by 10%. What is the new price? _____
2. A toy costs £50. It is reduced by 20%. What is the new price? _____
3. A chocolate bar costs £1.60. It is reduced by 25%. What is the new price? _____
4. A notebook costs £12. It is reduced by 50%. What is the new price? _____
5. A pair of shoes costs £40. It is reduced by 10%. What is the new price? _____
6. A school trip costs £60. It is reduced by 25%. How much does it cost now? _____
7. A sandwich costs £5. It is reduced by 20%. What is the new price? _____
8. A video game costs £36. It is reduced by 50%. What is the new price? _____
9. A bike costs £80. It is reduced by 10%. What is the new price? _____
10. A bottle of juice costs £4. It is reduced by 25%. What is the new price? _____

Worksheet 6: Percentages in Word Problems

Explanation:

Percentages are often used in **everyday life**, such as **shopping, school marks, or sharing things**.

Steps to solve word problems:

Identify the **total number**.

Identify the **percentage** you need to find.

1. Calculate the **percentage of the total** (use ÷ 10, ÷ 5, ÷ 4, ÷ 2, ×3 ÷4, etc.).
2. Check if you need to **add, subtract, or just find the amount**.

   Example 1:
   A box has 20 chocolates. 25% are dark chocolate.

   - 25% = $\frac{1}{4}$ of 20 → 20 ÷ 4 = 5 dark chocolates

   Example 2:
   A shop has 40 pencils. 50% are blue.

   - 50% = half → 40 ÷ 2 = 20 blue pencils

1. A class has 30 children. 50% are girls. How many girls are there? _____
2. A shop sells 80 apples. 25% are green. How many green apples? _____
3. A cake has 12 slices. 75% are eaten. How many slices were are left? _____
4. A book has 200 pages. You read 10%. How many pages are left to read? _____
5. A school has 120 pupils. 20% are absent. How many pupils are absent? _____
6. A bag of 40 sweets: 50% are red. How many sweets are red? _____
7. A toy costs £60. It increases by 25%. What is the new price? _____
8. A video game costs £80. It is reduced by 10%. What is the new price? _____
9. There are 16 pencils. 75% are sharpened. How many are blunt? _____
10. A box has 50 chocolates. 20% are eaten. How many are left? _____

Worksheet 7: Converting Percentages and Decimals

Explanation:

Percentages can be written as **decimals** and decimals can be written as **percentages**.

1. To convert a **percentage to a decimal**, divide by 100
2. Example: 25% → 25 ÷ 100 = 0.25
   - Example: 50% → 50 ÷ 100 = 0.5
3. To convert a **decimal to a percentage**, multiply by 100
   - Example: 0.6 → 0.6 × 100 = 60%
   - Example: 0.25 → 0.25 × 100 = 25%

A. Convert percentages to decimals:

1. 10% → _____
2. 25% → _____
3. 50% → _____
4. 75% → _____
5. 100% → _____

B. Convert decimals to percentages:

6. 0.1 → _____
7. 0.25 → _____
8. 0.5 → _____
9. 0.75 → _____
10. 1 → _____

Worksheet 8: Comparing Percentages

Explanation:

Sometimes you need to **compare percentages** to see **which is larger or smaller**.

You can compare by:

Thinking about what the percentage means (for example, 50% is half).

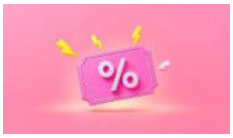
Converting to a **decimal** if it helps (for example, 0.6 = 60%).

Finding the percentage of the **same total** to compare fairly.

Example 1:
Which is greater: 25% or 50%?
50% is greater because half is more than a quarter.

Example 2:
Which is greater: 40% of 20 or 50% of 20?
40% of 20 = 8
50% of 20 = 10
So, **50% of 20 is greater**.

1. Which is greater:25% or75%? _____
2. Which is smaller: 50% or10%? _____
3. Which is greater:40% or60%? _____
4. Which is greater: 0.5 or50%? _____
5. Which is smaller: 0.25 or 30%? _____
6. Which is greater: 30% of 20 or 50% of 20? _____
7. Which is smaller: 25% of 40 or 10% of 40? _____
8. Which is greater: 75% of 16 or 50% of 16? _____
9. Which is smaller: 20% of 50 or 40% of 50? _____
10. Which is greater: 10% of 100 or 25% of 100? _____



Worksheet 9:

Multi-step Percentage Problems

Some percentage problems need **more than one step**.

You may need to:

- Find a percentage of a number.
- Then **add or subtract** it.
- Or find a part and then work out what is **left**.

Example:
A jacket costs £40. It is reduced by 25%, then increased by 10%.

Step 1: 25% of £40 = 40 ÷ 4 = £10
New price = 40 − 10 = £30

Step 2: 10% of £30 = 30 ÷ 10 = £3
Final price = 30 + 3 = **£33**

1. A book costs £20. It is reduced by 10%. What is the new price? _____
2. A toy costs £40. It is reduced by 25%. What is the new price? _____
3. A bag costs £50. It increases by 20%, then increases by 10%. What is the final price? _____
4. A bike costs £100. It is reduced by 20%, then reduced by 10%. What is the final price? _____
5. A class has 40 pupils. 25% go on a trip. How many pupils go on the trip, and how many stay behind?
   Go on trip: _____ Stay behind: _____
6. A box has 60 sweets. 30% are eaten. How many sweets are left? _____
7. A jumper costs £80. It is reduced by 25%, then increased by 10%.
   What is the final price? _____
8. A school has 200 pupils. 10% are absent and 20% are in the library. How many pupils are in the library? _____
9. A farmer has 120 apples. He sells 25% in the morning and 25% in the afternoon. How many apples are left? _____
10. A game costs £60. It increases by 10%, then decreases by 20%.
    What is the final price? _____

Worksheet 10: Challenge

1. What is 35% of 80? _____
2. A jacket costs £60. It is reduced by 15%. What is the new price? _____
3. 20% of a number is 18. What is the number? _____
4. Convert 0.45 to a percentage. _____
5. Which is greater: 40% of 50 or 25% of 80? _____
6. A class has 32 pupils. 75% are present. How many pupils are present? _____
7. A phone costs £200. It increases by 10%, then increases by 5%. What is the final price? _____
8. 60% of a box of 90 biscuits are eaten. How many biscuits are left? _____
9. A school has 150 pupils. 40% are in Year 5. How many pupils are in Year 5? _____
10. A book costs £48. It is reduced by 25%, then reduced by 10%. What is the final price? _____

Answers

Percentage Workbook – Answer Book

Worksheet 1 Answers

1. 5
2. 10
3. 8
4. 3
5. 12
6. 3
7. 2
8. 5
9. 9
10. 7

Worksheet 2 Answers

1. 5
2. 12
3. 48
4. 14
5. 16
6. 36
7. 24
8. 12
9. 72
10. 18

Worksheet 3 Answers

1. 50% of a number is 6

   50% = $\frac{1}{2}$ → Total =6 ×2 =**12**

2. 25% of a number is 5

   25% = $\frac{1}{4}$ → Total = 5 × 4 = **20**

3. 10% of a number is 7

   10% = $\frac{1}{10}$ → Total = 7 × 10 = **70**

4. 75% of a number is 12

   75% = $\frac{3}{4}$ → Total = 12 × 4 ÷ 3 = **16**

5. 50% of a number is 14

   50% = $\frac{1}{2}$ → Total = 14 × 2 = **28**

6. 20% of a number is 8

   20% = $\frac{1}{5}$ → Total = 8 × 5 = **40**

7. 25% of a number is 6

   25% = $\frac{1}{4}$ → Total = 6 × 4 = **24**

8. 50% of a number is 10

   50% = $\frac{1}{2}$ → Total = 10 × 2 = **20**

9. 10% of a number is 9

   10% = $\frac{1}{10}$ → Total = 9 × 10 = **90**

10. 70% of a number is 70

    70% = $\frac{7}{10}$ → Total = 7 x 10 =**100**

Worksheet 4 Answers

Explanation

To calculate a percentage increase, find the value of the percentage and add it to the original amount.

1. A bag costs £30. It increases by 10%. The new price is **£33**.
2. A toy costs £50. It increases by 20%. The new price is **£60**.
3. A chocolate bar costs 80p. It increases by 25%. The new price is **100p** (or **£1**).
4. A notebook costs £12. It increases by 50%. The new price is **£18**.
5. A pair of shoes costs £40. It increases by 10%. The new price is **£44**.
6. A school trip costs £60. It increases by 25%. The new price is **£75**.
7. A sandwich costs £5. It increases by 20%. The new price is **£6**.
8. A video game costs £36. It increases by 50%. The new price is **£54**.
9. A bike costs £80. It increases by 10%. The new price is **£88**.
10. A bottle of juice costs £4. It increases by 25%. The new price is **£5**

Worksheet 5 Answers

To find the new price after a percentage reduction, calculate the discount by multiplying the original price by the percentage, then subtract that amount from the original price.

1. A bag costs £30. It is reduced by 10%. The new price is **£27**.
2. A toy costs £50. It is reduced by 20%. The new price is **£40**.
3. A chocolate bar costs £1.60. It is reduced by 25%. The new price is **£1.20**.
4. A notebook costs £12. It is reduced by 50%. The new price is **£6**.
5. A pair of shoes costs £40. It is reduced by 10%. The new price is **£36**.
6. A school trip costs £60. It is reduced by 25%. The new price is **£45**.
7. A sandwich costs £5. It is reduced by 20%. The new price is **£4**.
8. A video game costs £36. It is reduced by 50%. The new price is **£18**.
9. A bike costs £80. It is reduced by 10%. The new price is **£72**.
10. A bottle of juice costs £4. It is reduced by 25%. The new price is **£3**.

Worksheet 6 Answers

1. 15 girls
2. 20 green apples
3. 3 slices left
4. 180 pages left
5. 24 pupils absent
6. 20 red sweets
7. £75
8. £72
9. 4 blunt pencils
10. 40 chocolates left

Worksheet 7 Answers

A. Convert percentages to decimals:

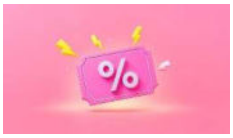
1. $10\% \rightarrow 10 \div 100 = 0.1$
2. $25\% \rightarrow 25 \div 100 = 0.25$
3. $50\% \rightarrow 50 \div 100 = 0.5$
4. $75\% \rightarrow 75 \div 100 = 0.75$
5. $100\% \rightarrow 100 \div 100 = 1$

B. Convert decimals to percentages:

6. $0.1 \rightarrow 0.1 \times 100 = 10\%$
7. $0.25 \rightarrow 0.25 \times 100 = 25\%$
8. $0.5 \rightarrow 0.5 \times 100 = 50\%$
9. $0.75 \rightarrow 0.75 \times 100 = 75\%$
10. $1 \times 100 = 100\%$

Worksheet 8 Answers

1. 75%
2. 10%
3. 60%
4. Equal
5. 0.25
6. 50% of 20
7. 10% of 40
8. 75% of 16
9. 20% of 50
10. 25% of 100



Worksheet 9 Answers

1. £18
2. £30
3. £66
4. £72
5. Go: 10 Stays behind: 30
6. 42
7. £66
8. 40
9. 60
10. £52.80

Worksheet 10 Answers

1. 28
2. £51
3. 90
4. 45%
5. Equal
6. 24
7. £231
8. 36
9. 60
10. £32.40