One-Step Word Problems Percentage of Amounts

Aim: I can solve one-step word problems involving percentages.

1. A grocer has 60kg of potatoes. In one day, he sells 50% of the potatoes. What mass of potatoes does he sell?

2. A decorator buys 24 litres of paint. When he finishes painting, there is 25% of the paint left. How much paint is left?

3. A collection is made for local charities, which raises $60. 20% of the money is given to a children's charity. How much does the children's charity receive?

4. Amit reads a book with 250 pages. He reads 10% of the book each day. How many pages does he read each day?

5. 5.An athlete runs 30 miles a week. On one day, the athlete runs 40% of the mileage. How long does the athlete run on this day?

6. A sunflower grows to be 200cm tall. After four weeks, it was 30% of this height. How tall was the sunflower after four weeks?

7. Six children collect 45 pencils. 20% of the pencils need sharpening. How many pencils need sharpening?

8. A football match lasts 90 minutes. One player plays 80% of the match. How many minutes does the player play?

9. There is 500g of flour left in the cupboard. 90% is needed for a cake. How much flour is needed for the cake?

10. 270 children attend a school. 60% of the children walk to school. How many children walk to school?

Challenge
Write some simple one-step word problems involving percentages for a partner.

One-Step Word Problems Percentage of Amounts **Answers**

1. **60 ÷ 2 = 30 (50%)**
   or
   60 ÷ 100 × 50 = 30
   30kg

2. **24 ÷ 4 = 6 (25%)**
   or
   24 ÷ 100 × 25 = 6
   6 litres

3. **60 ÷ 5 = 12 (20%)**
   or
   60 ÷ 100 × 20 = 12
   $12

4. **250 ÷ 10 = 25 (10%)**
   or
   250 ÷ 100 × 10 = 25
   25 pages

5. **30 ÷ 10 = 3 (10%)**
   3 × 4 = 12 (40%)
   or
   30 ÷ 100 × 40 = 12
   12 miles

6. **200 ÷ 10 = 20 (10%)**
   20 × 3 = 60 (30%)
   or
   200 ÷ 100 × 30 = 60
   60cm tall

7. **45 ÷ 5 = 9 (20%)**
   or
   45 ÷ 100 × 20 = 9
   9 pencils

8. **90 ÷ 100 × 80 = 72 (80%)**
   or
   90 ÷ 5 = 18 (20%)
   90 - 18 = 72
   72 minutes

9. **500 ÷ 100 × 90 = 450 (90%)**
   or
   500 ÷ 10 = 50 (10%)
   50 x 9 = 450 (90%)
   450g

10. **270 ÷ 100 × 60 = 162**
    162 children

Multi-Step Word Problems Percentage of Amounts

Aim: I can solve two-step word problems involving percentages.

1. A supermarket stocks 300kg of potatoes. 25% of the potatoes are sold in 5kg bags. The rest are sold in 1.5kg bags. What mass of potatoes are sold in 1.5kg bags?

2. Some children hold a bake sale for a local charity and raise $90. 10% comes from selling biscuits. 50% of the remaining money comes from selling chocolate cakes. How much is made from selling chocolate cakes?

3. A builder has 600kg of bricks delivered to build an extension to a house. 50% are used on the first day, and 25% are used on the second day. How many bricks are left after the second day?

4. Niamh enters the 500 words story competition. She writes 10% of the story on the first day. How many words has she left to write?

5. A swimmer swims 800m every morning. She swims the first 50% of the distance on her front, and then 25% of the remaining distance on her back, before finishing on her front. How far does she swim on her back?

6. 25% of the 240 children in a school come to the breakfast club. There are enough places for another 10% of the children in the school to attend the breakfast club. How many places are there at the breakfast club?

7. A florist has 85m of florist wire. In one day 10% of the wire is used. How much wire is left?

8. 3000 people attend a football match. 25% of the crowd are children. 10% of the children are under five years old. How many children under five years old are in the crowd?

9. A baker has 2000kg of white flour and 1500kg of wholemeal flour. The flour is mixed together and 50% is used to make bread. How much flour is used to make bread?

10. Some children are asked to hand out some felt pens to each class. Each class receives 25% of the felt pens. Each class receives 35 pens. How many pens are given out?

Challenge
Write some simple two-step word problems involving percentages for a partner.

Multi-Step Word Problems Percentage of Amounts **Answers**

1. **300 ÷ 100 × 75 = 225 (75%)**
   or
   300 ÷ 4 = 75 (25%)
   300 - 75 = 225
   225kg of potatoes sold in 1.5kg bags

2. **90 ÷ 100 × 10 = 9 (10%)**
   90 – 9 = 81
   81 ÷ 100 × 50 = 40.5 (or 81 ÷ 2 = 40.5)
   (50% of the remaining money)
   $40.50 made from selling chocolate cakes

3. **50% + 25% = 75%**
   600 ÷ 100 × 75 = 450 bricks used
   600 - 450 = 150 left
   or children may understand there is 25% left;
   600 ÷ 100 × 25 = 150
   150 bricks left

4. **500 ÷ 10 = 50 (10%)**
   500 - 50 = 450
   450 words left to write

5. **50% + 25% = 75% on front**
   800 ÷ 100 × 75 = 600 on front
   800 - 600 = 200 remaining
   or children may understand there is 25% left;
   800 ÷ 100 × 25 = 200
   She swam 200m on her back

6. **240 ÷ 100 × 25 = 60 (or 240 ÷ 4 = 60) (25%)**
   240 ÷ 10 = 24 (10%)
   60 + 24 = 84
   84 places

7. **85 ÷ 10 = 8.5 (10%)**
   85 - 8.5 = 76.5
   76.5m of wire left

8. **3000 ÷ 100 × 25 = 750 (or 3000 ÷ 4 = 750) (25%)**
   750 ÷ 10 = 75
   75 children under five years old

9. **2000 + 1500 = 3500**
   3500 ÷ 100 × 50 = 1750 (or 3500 ÷ 2 = 1750) (50%)
   1750kg

10. **(25% per class) 35 × 4 = 140 (100%)**
    140 pens

Multi-Step Word Problems Percentage of Amounts

Aim: I can solve two-step word problems involving percentages.

1. A farmer harvests 850kg of parsnips. 30% go to the local market and 50% go to a local supermarket. What mass of parsnips are left?

2. A plumber has 150m of pipes. The plumber uses 20% fitting a central heating system, and then 25% of what is left to fit a bathroom. How much pipe does the plumber use to fit the bathroom?

3. A library has 2500 books. 40% of the books are fiction. How many books are not fiction books?

4. A cyclist rides 460 miles each week in training. 30% of the mileage is in one ride. 10% of the remaining mileage is cycled in sprints. How many miles are cycled in sprints?

5. A charity raises $1740 at an auction. 20% of the money was raised by auctioning one item. How much did the rest of the auction raise?

6. 680 pupils attend a primary school. 20% of the children are in the Foundation Stage and 25% are in Years 1 and 2. How many children are in Year 3-6?

7. Janek's height increases by 10% each year for two years. At the beginning of those two years, he was 120cm tall. How tall is he at the end of the two years?

8. 90 000 people attend the FA cup final. 10% are not fans of either team. 50% of the remaining fans are from each team. How many fans from each team attend the final?

9. 450g of flour is needed for a cake recipe. A new packet of 2kg flour is used. 20% of the remaining flour is used to make some pastry. How much flour is used to make pastry?

10. There are 450 chairs in a school. 80% of the chairs are in good condition. Of the remaining chairs, 40% need to be thrown away. How many chairs need to be thrown away?

Challenge
Write some simple two-step word problems involving percentages for a partner.

Two-Step Word Problems Percentage of Amounts **Answers**

1. **850 ÷ 100 × 80 = 680 (80% gone)**
850 - 680 = 170
or children may understand there is 20% left;
850 ÷ 100 × 20 = 170
170g of parsnips left

2. **150 ÷ 100 × 20 = 30 (or 150 ÷ 5 = 30)**
(20% for central heating)
150 - 30 = 120 (pipe leftover)
120 ÷ 100 × 25 = 30 (or 120 ÷ 4 = 30)
(25% of the pipe leftover)
30m pipe used to fit the bathroom

3. **2500 ÷ 100 × 40 = 1000 (40%)**
2500 - 1000 = 1500
or children may understand there is 60% left;
2500 ÷ 100 × 60 = 1500
1500 books are not fiction

4. **460 ÷ 100 × 30 = 138 (30%)**
460 - 138 = 322 (remaining mileage)
322 ÷ 100 x 10 = 32.2 (10% of the remaining mileage)
32.2 miles are cycled in sprints

5. **1740 ÷ 100 × 20 = 348 (20%)**
1740 - 348 = 1392
or children may understand there is 80% left;
1740 ÷ 100 × 80 = 1392
$1392 raised by the rest of the auction

6. **680 ÷ 100 × 45 = 306**
680 - 306 = 374
374 children are in Year 3-6

7. **120 ÷ 100 × 10 = 12cm (10%)**
120 + 12 = 132cm (height after year 1)
132 ÷ 100 × 10 = 13.2cm (10%)
132 + 13.2 = 145.2cm (height after year 2)
145.2cm at the end of two years

8. **90 000 ÷ 100 × 10 = 9000 (10%)**
90 000 - 9000 = 81 000 (remaining fans)
81 000 ÷ 2 = 40 500 (50%)
40 500 fans from each team attend the final

9. **change 2kg to 2000g**
2000 - 450 = 1550 (remaining flour)
1550 ÷ 100 × 20 = 310 (or 1550 ÷ 5 = 310)
(20% of the remaining flour)
310g flour used to make pastry

10. **450 ÷ 100 × 80 = 360 (80% good chairs)**
450 - 360 = 90 (remaining chairs)
90 ÷ 100 × 40 = 36 (40%)
36 chairs need to be thrown away

Multi-Step Word Problems Percentage of Amounts

Aim: I can solve multi-step word problems involving percentages.

1. A supermarket has 1800kg of root vegetables. 50% are potatoes and 25% are onions. What mass are the remaining root vegetables?

2. A school has a sponsored spell to raise money for their chosen charity, raising $764. 50% of the money is raised through dressing up. Of the remaining money, 25% is raised by selling cakes. The rest is raised by pupils paying to play games. How much is raised by playing games?

3. A book is 340 pages long. 10% of the book is the introduction. Alex reads the introduction and 50% of the rest of the book in one week. How many pages are left to read?

4. A plasterer buys fifteen 25kg bags of plaster. At the end of the week, only 10% of the plaster is left. What mass of plaster has the plasterer used?

5. A football team trains for 18 hours every week. 25% of the time is spent on fitness and 10% on skills. The rest of the time is spent preparing for the next match. How long is spent on preparing for the next match?

6. In a class of 30 children, 10% cycle to school. Another 10% come by bus. 25% of the remaining children come by car. The rest of the children walk. How many children walk to school?

7. The population of a town is 24 400. 25% of the people are children. 10% of the children are under the age of two. How many children under the age of two live in the town?

8. A school orders 80 packs of pencils. Each pack contains 12 pencils. 10% of the pencils are given out the day they arrive in school. How many pencils are given out on the first day?

9. A bakery uses 48kg of flour each day to bake bread. 2kg of flour makes three loaves of bread. 25% of the loaves are wholemeal loaves. How many wholemeal loaves are baked each day?

10. A sunflower is measured at the beginning of June and is 40cm tall. The sunflower grows by 25% each month for three months. What height is the sunflower to the nearest centimetre at the beginning of September?

Challenge
Write some simple multi-step word problems involving percentages for a partner.

Multi-Step Word Problems Percentage of Amounts **Answers**

1. **1800 ÷ 100 × 75 = 1350 (75%)**
   1800 - 1350 = 450
   or children may understand there is 25% left;
   1800 ÷ 100 × 25 = 45 (or 1800 ÷ 4 = 450) (25%)
   450kg remaining root vegetables

2. **764 ÷ 100 × 50 = 382 (or 764 ÷ 2 = 382) (50%)**
   382 ÷ 100 × 25 = 95.5 (or 382 ÷ 4 = 95.5) (25% of remaining money)
   382 + 95.5 = 477.5 (total raised by dressing up & selling cakes)
   764 - 477.5 = 286.50
   $286.50 raised by playing games

3. **340 ÷ 10 = 34 (10%)**
   340 - 34 = 306 (rest of the book)
   306 ÷ 100 × 50 = 153 (or 306 ÷ 2 = 153) (50% of the rest of the book)
   34 + 153 = 187 (total pages read)
   340 - 187 = 153
   153 pages left to read

4. **15 × 25 = 375**
   375 ÷ 10 = 37.5 (10%)
   375 - 37.5 = 337.5
   337.5kg

5. **change 18 hours to 1080 minutes**
   1080 ÷ 100 × 65 = 702 (65% rest of the time)
   702 ÷ 60 = 11.7 (to find the minutes, 0.7 × 60 = 42)
   702 minutes or 11 hours and 42 minutes spent preparing for the next match

6. **10% + 10% = 20%**
   30 ÷ 100 × 20 = 6 children (cycle and bus) (or 30 ÷ 5 = 6) (20%)
   30 - 6 = 24 (remaining children)
   24 ÷ 100 × 25 = 6 children (car) (or 24 ÷ 4 = 6) (25%)
   24 - 6 = 18 remaining
   18 children walk to school

7. **24 400 ÷ 100 × 25 = 6100 (or 24 400 ÷ 4 = 6100) (25%)**
   6100 ÷ 10 = 610 (10%)
   610 children under the age of two

8. **80 × 12 = 960 (total pencils)**
   960 ÷ 10 = 96 (10%)
   96 pencils given out on the first day

9. **48 ÷ 2 = 24 (total bakes)**
   24 × 3 = 72 (total loaves)
   72 ÷ 100 × 25 = 18 (or 72 ÷ 4 = 18) (25%)
   18 loaves

10. **40 ÷ 100 × 25 = 10cm growth (or 40 ÷ 4 = 10) (25%)**
    40 + 10 = 50cm (height after 1 month)
    50 ÷ 100 × 25 = 12.5cm growth (or 50 ÷ 4 = 12.5) (25%)
    50 + 12.5 = 62.5cm (height after 2 months)
    62.5 ÷ 100 × 25 = 15.625cm growth (or 62.5 ÷ 4 = 15.625 (25%)
    62.5 + 15.63 = 78.125 (height after 3 months)
    78cm (to the nearest cm)

Multi-Step Word Problems Percentage of Amounts

Aim: I can solve multi-step word problems involving percentages.

1. A grocer has 160kg of onions. 50% of the onions are sold in 2kg bags. The rest are sold loose. 20% of the loose onions and 12 bags of onions are left at the end of the day. What percentage of onions were sold that day?

2. A bookshop has a stock of 11 240 books. 45% of the books are adult fiction and 20% are children's fiction. 480 fiction books are sold in one week, 50% of which are children's fiction. How many children's books will be left at the end of the week?

3. A pallet holds 250 bricks. A builder orders three pallets. 60% of the bricks are used to build wall A. 80% of the remaining bricks from wall A are used to build wall B. How many bricks are left after building both walls?

4. A hospital charity has 25 people raising money by running a half marathon. The average each person raises is $120. 10% of the money is used to pay the entry fees for the half marathon. How much money is raised after the fees are paid?

5. There are 420 children in a school. 20% of the children bring a cold lunch from home. The rest of the children eat school meals, of which 25% eat a cold meal made by school. How many children eat a cold meal?

6. A long-jumper trains for 32 hours a week. She spends 40% of the time running. 75% of the remaining time is spent on jumping practice. How much time does she spend practising jumping?

7. A plumber charges $20 call out fee and $12 per hour. The plumber decides to decrease the call out fee by 25% and increase the hourly rate by 25%. Explain why the plumber will charge more for two hours work under the new charges.

_____

_____

8. Simon makes jam to sell at a market. The amount of sugar he uses is 40% of the weight of fruit. He uses 3.6kg of sugar. How much fruit will he use?

9. A school orders 1460 exercise books. 30% of the books have squared paper, 45% have lines and the remaining books are plain. By the end of the first term, all the squared and lined books have been used, and 80% of the plain books have been used. How many books are left?

10. A baby increases in weight by 10% each week for two weeks and then 5% in week 3. The baby is first weighed at 20kg. What was the weight, to 1 decimal place, after 3 weeks?

Challenge
Write some simple multi-step word problems involving percentages for a partner.

Multi-Step Word Problems Percentage of Amounts **Answers**

1. **160 ÷ 100 × 50 = 80kg in bags (or 160 ÷ 2 = 80) (50% 2kg bagged onions)**
160 - 80 = 80kg (loose onions left over)
80 ÷ 100 × 20 = 16kg (or 80 ÷ 5 = 16) (20% loose onions left over)
12 × 2 = 24kg (12 bags left over)
16 + 24 = 40kg
40 ÷ 160 = 0.25 = 25% (onions left over)
75% onions sold that day

2. **11 240 ÷ 100 × 20 = 2248 (children's fiction)**
480 ÷ 2 = 240 (50% of children's fiction books sold)
2248 - 240 = 2008
2008 children's books left at the end of the week

3. **250 × 3 = 750 (total bricks)|**
750 ÷ 100 × 60 = 450 (60% bricks used for wall A)
750 - 450 = 300 (remaining bricks)
300 ÷ 100 × 80 = 240 (80% bricks used for wall B)
450 + 240 = 690 (total used bricks)
750 - 690 = 60
60 bricks left

4. **25 × 120 = $3000 (total raised)**
3000 ÷ 10 = $300 (10% entry fee)
3000 - 300 = $2700
$2700

5. **420 ÷ 100 × 20 = 84 (or 420 ÷ 5 = 84) (20% cold lunch from home)**
420 - 84 = 336 (remaining children)
336 ÷ 100 × 25 = 84 (or 336 ÷ 4 = 84) (25% cold meal made by school)
84 + 84 = 168
168 children eat a cold meal

6. **change hours into minutes (32 × 60 = 1920)**
1920 ÷ 100 × 40 = 768 (40% time running)
1920 - 768 = 1152 (remaining time)
1152 ÷ 100 × 75 = 864
864 ÷ 60 = 14.4 (to find the minutes, 0.4 × 60 = 24)
14 hours and 24 minutes

7. **old charges:**
20 + 12 + 12 = 44
$44

new charges:
20 ÷ 100 × 25 = $5 less call out fee (or 20 ÷ 4 = 5) (20%)
20 - 5 = $15 (new call out fee)
12 ÷ 100 × 25 = $3 more per hour (or 12 ÷ 4 = 3) (25%)
12 + 3 = $15 (new hourly rate)
15 + 15 + 15 = 45
$45

The new price would be $1 more for two hours work under the new charges.

8. **3.6 ÷ 4 = 0.9**
   0.9 × 10 = 9 (total weight of fruit)
   9kg fruit

9. **45% + 30% = 75%**
   25% plain

   1460 ÷ 100 × 25 = 365 (or 1460 ÷ 100 × 25 = 365)
   365 ÷ 100 × 80 = 292 used (80%)
   365 - 292 = 73 left
   or children may understand there is 20% left;
   365 ÷ 100 × 20 = 73
   73 books

10. **20 ÷ 100 × 10 = 2kg increase (10%)**
    20 + 2 = 22kg (week 1)

    22 ÷ 100 × 10 = 2.2kg increase (10%)
    22 + 2.2 = 24.2kg (week 2)

    24.2 ÷ 100 × 5 = 1.21kg increase (5%)
    24.2 + 1.21 = 25.41kg

    25.4kg after 3 weeks

Multi-Step Word Problems Percentage of Amounts

Aim: I can solve multi-step word problems involving percentages.

1. An author writes 2400 words each day. The book being written is 80 000 words. What percentage of the book does the author write each day?

2. A car has 60 litres of fuel in the tank. After a long journey, only 22% of the fuel is left. The driver puts another 30 litres into the tank, and uses 25% of the fuel in the tank over the following day. How much fuel is now in the tank?

3. A paint shop stocks 1800 litres of paint. 24% of the paint is white. The shop sells 18% of the white paint and 7% of the rest of the paint. How much paint is sold altogether?

4. A school raises $468 for their chosen charity by dressing up. The money raised is increased by 42% by holding a cake sale. The Headteacher makes up the total sum to $700. How much does the Headteacher donate?

5. A rugby team spends a number of hours training each week. 35% is spent on fitness and this lasts for 7 hours and 21 minutes. How long do the team spend training each week?

6. There are three Year 6 classes in a school, with 28 children in each class. 75% of the children are going on a residential trip. 33% of the remaining children are going to visit the trip for one day. The remaining children have a different visit arranged. How many children will be on this different visit?

7. A locksmith charges $32 call out charge and $15 per hour. The locksmith decides to reduce his callout by 25% and increase the hourly charge by 20%. After what period of time will the locksmith earn more with the new charges?

_____

_____

8. A city's population is 480 000. 28% of the people in the city are children. There are 69 888 children under 11 years old. What percentage of the children are under 11 eleven years old?

9. A factory making tomato soup has 400kg tomatoes delivered each week. The factory uses 72% of the tomatoes each week to make the soup. After how many weeks does the factory not need to take delivery of any more tomatoes because it still has enough from the previous week?

_____

_____

10. A young tree grows by 20% each year for three years. After three years, the tree is 1728mm tall. How tall was the tree at the beginning of the three years?

Challenge
Write some simple multi-step word problems involving percentages for a partner.

Multi-Step Word Problems Percentage of Amounts **Answers**

1. **80 000 ÷ 100 = 800 (1%)**
   2400 ÷ 800 = 3%
   3% of the book is written each day

2. **60 ÷ 100 × 22 = 13.2 litres left (22%)**
   13.2 + 30 = 43.2 litres after refill
   43.2 ÷ 100 × 25 = 10.8 (25% used following day)
   43.2 - 10.8 = 32.4
   32.4 litres are left in the tank

3. **1800 ÷ 100 × 24 = 432 litres white (24%)**
   1800 – 432 = 1368 litres not white
   432 ÷ 100 × 18 = 77.76 litres of white sold (18%)
   1368 ÷ 100 × 7 = 95.76 litres of not white sold (7%)
   77.76 + 95.76 = 173.52
   173.52 litres of paint sold

4. **468 ÷ 100 × 42 = $196.56 raised at cake sale (42%)**
   468 + 196.56 = $664.56
   700 - 664.56 = $35.44
   $35.44 donated by headteacher

5. **convert to minutes**
   7 × 60 = 420 minutes
   420 + 21 = 441 minutes = 35% of time
   441 ÷ 3.5 = 126 (10% of time)
   126 × 10 = 1260 (100% minutes total training)
   convert to hours and minutes
   1260 ÷ 60 = 21
   21 hours

6. **28 × 3 = 84 Year 6 children in total**
   84 ÷ 100 × 75 = 63 children going on trip (75% residential trip)
   84 - 63 = 21 (remaining children)
   21 ÷ 100 × 33 = 6.93 rounded to 7 children are going on the day trip

7. **new charges:**
   32 ÷ 100 × 25 = $8 less call out charge (25%)
   32 - 8 = $24 (new call out charge)
   15 ÷ 100 × 20 = $3 increase per hour (20%)
   15 + 3 = $18 (new hourly charge)

time	old charges	new charges
1 hour	32+15=$47	24+18=$42
2 hours	32+15+15= $62	24+18+18=$60
3 hours	32+15+15+15=$77	24+18+18+18=$78

8. **480 000 ÷ 100 × 28 = 134 400 (28% children)**
   134 400 ÷ 100 = 1344 (1%)
   69 888 ÷ 1344 = 52
   52% of the children are under 11 years old

9. **100 – 72 = 28% not used each week**
   400 ÷ 100 × 28 = 122kg spare per week (28%)
   need at least 400 kg to make soup:
   week 1 = 122kg left
   week 2 = 244kg left (122 + 122)
   week 3 = 366kg left (244 + 122)
   week 4 – 488kg left (366 + 122)
   After 4 weeks the factory would have 488kg left over an could make the soup without a delivery.

10. **1728 ÷ 100 × 20 = 345.6 (20%)**
    1728 - 345.6 = 1382.4mm (1 year ago/2 years of growth)
    1382.4 ÷ 100 × 20 = 276.48 (20%)
    1382.4 - 276.48 = 1105.92mm (2 years ago/1 year of growth)
    1105.92 ÷ 100 × 20 = 221.184mm (20%)
    1105.92 - 221.184 = 884.736 (3 years ago)
    884.74mm (rounded to 2dp) at the beginning of the three years