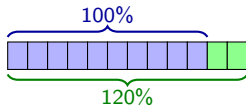


Percentages with Multipliers: Starters

Starter

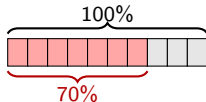
**Write the multiplier
under each bar model.**

Increase by 20%



Multiplier: $\times$ ____

Decrease by 30%



Multiplier: $\times$ ____

1. Write 0.35 as a percentage and as a fraction in its simplest form.
2. Write $\frac{3}{8}$ as a decimal and as a percentage.

3. Complete the table of multipliers.

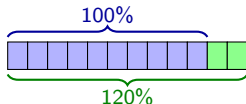
Change	New amount	Multiplier
increase of 20%	120%	1.2
increase of 5%	_____	_____
decrease of 30%	70%	_____
decrease of 8%	_____	_____

4. Increase £240 by 15%. 5. Reduce £45 by 30%.
6. A school has 850 pupils. The roll rises by 6%. How many pupils now?
7. Toby says "an increase of 10% is $\times 1.1$, so a decrease of 10% is $\times 0.1$ ". Explain why he is wrong and give the correct multiplier.

Starter

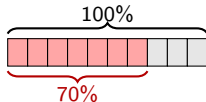
Write the multiplier
under each bar model.

Increase by 20%



Multiplier: $\times 1.2$

Decrease by 30%



Multiplier: $\times 0.7$

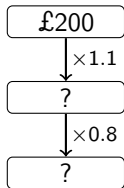
1. Write 0.35 as a percentage and as a fraction in its simplest form. $35\% = \frac{7}{20}$
2. Write $\frac{3}{8}$ as a decimal and as a percentage. $0.375 = 37.5\%$

3. Complete the table of multipliers.

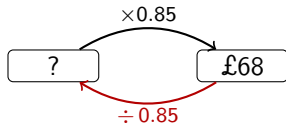
Change	New amount	Multiplier
increase of 20%	120%	1.2
increase of 5%	105%	1.05
decrease of 30%	70%	0.7
decrease of 8%	92%	0.92

4. Increase £240 by 15%. $240 \times 1.15 = \text{£}276$
5. Reduce £45 by 30%. $45 \times 0.7 = \text{£}31.50$
6. A school has 850 pupils. The roll rises by 6%. How many pupils now? $850 \times 1.06 = 901$ pupils
7. Toby says "an increase of 10% is $\times 1.1$, so a decrease of 10% is $\times 0.1$ ". Explain why he is wrong and give the correct multiplier. $\times 0.1$ leaves only 10%, a decrease of 90%. A decrease of 10% leaves 90%, so $\times 0.9$.

Starter



A coat reduced by 15% costs £68

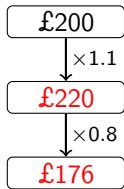


Multiply to go forwards.

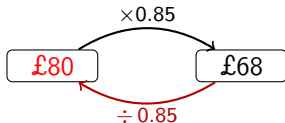
Divide by the multiplier to go back.

1. Write 45% as a decimal
2. Write $\frac{7}{20}$ as a percentage.
3. Write the missing prices in the boxes of the first flow chart.
4. Write the multiplier for an increase of 3.5%.
5. A bike costs £180. The price rises by 10%, then the new price falls by 10%. Find the final price, and the single multiplier for the two changes together.
6. Write the coat's original price in the empty box of the second flow chart.
7. A meal costs £42 after a 20% service charge. Find the price before the charge.
8. A jacket has 20% off, then a further 10% off at the till, and costs £180. Find the original price.

Starter



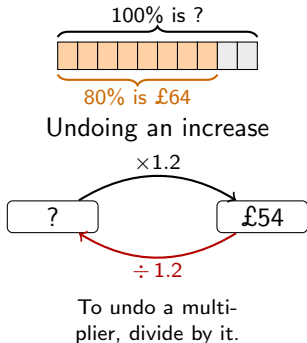
A coat reduced by 15% costs £68



Multiply to go forwards.
Divide by the multiplier to go back.

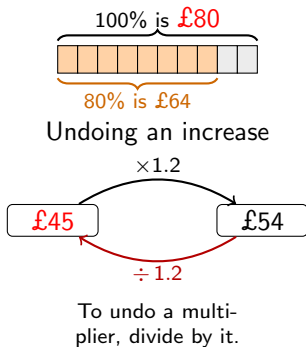
1. Write 45% as a decimal and 0.06 as a percentage. **0.45 and 6%**
2. Write $\frac{7}{20}$ as a percentage. **35%**
3. Write the missing prices in the boxes of the first flow chart. **£220 then £176**
4. Write the multiplier for an increase of 3.5%. **$\times 1.035$**
5. A bike costs £180. The price rises by 10%, then the new price falls by 10%. Find the final price, and the single multiplier for the two changes together.
 $180 \times 1.1 \times 0.9 = £178.20$; $1.1 \times 0.9 = 0.99$, a 1% decrease
6. Write the coat's original price in the empty box of the second flow chart. **$68 \div 0.85 = £80$**
7. A meal costs £42 after a 20% service charge. Find the price before the charge. **$42 \div 1.2 = £35$**
8. A jacket has 20% off, then a further 10% off at the till, and costs £180. Find the original price.
 $0.8 \times 0.9 = 0.72$, so $180 \div 0.72 = £250$.

Starter



1. Write $\frac{5}{8}$ as a decimal and as a percentage.
2. Write 24% as a fraction in its simplest form.
3. A price is reduced by 20% to £64. Complete the chain from the bar model.
80% is £64
10% is ____
100% is ____
4. A price is increased by 20% to £54. Write the original price in the empty box of the flow chart.
5. A jacket costs £68 after a 15% reduction. Find the original price.
6. A salary rises by 4% to £33 280. Find the salary before the rise.
7. Sam says "a coat reduced by 25% costs £60, so the original price was $60 + 25\% \text{ of } 60 = £75$ ". Explain Sam's mistake and find the correct original price.

Starter

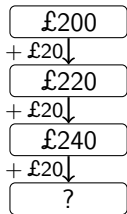


- Write $\frac{5}{8}$ as a decimal and as a percentage.
 $0.625 = 62.5\%$
- Write 24% as a fraction in its simplest form.
 $\frac{24}{100} = \frac{6}{25}$
- A price is reduced by 20% to £64. Complete the chain from the bar model.
80% is £64
10% is £8
100% is £80
- A price is increased by 20% to £54. Write the original price in the empty box of the flow chart.
 $54 \div 1.2 = £45$
- A jacket costs £68 after a 15% reduction. Find the original price.
 $68 \div 0.85 = £80$
- A salary rises by 4% to £33 280. Find the salary before the rise.
 $33\,280 \div 1.04 = £32\,000$
- Sam says "a coat reduced by 25% costs £60, so the original price was $60 + 25\%$ of $60 = £75$ ". Explain Sam's mistake and find the correct original price. The 25% was taken off the original price, not off £60. £60 is 75%, so $60 \div 0.75 = £80$.

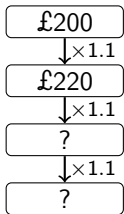
Starter

£200 for 3 years at 10%

Simple



Compound



Simple interest adds the same amount every year; compound interest uses the new balance.

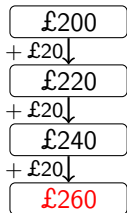
Year	Simple	Compound
1	£220	£220
2	£240	_____
3	_____	_____

- Write 3% as a decimal and 0.045 as a percentage.
- Write $\frac{1}{40}$ as a percentage.
- Write the missing balances in the boxes and in the table.
- Find the simple interest on £1200 at 5% for 4 years.
- Find the value of £4000 after 5 years at 3% compound interest.
- Ravi saves £300 for 3 years at either 6% simple or 5% compound. Which pays more?
- Account A pays 10% simple but holds at most £300. Account B pays 5% simple, no maximum. Dev saves £1000 for 3 years. Which is better, and by how much?

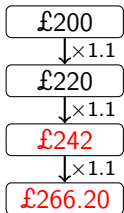
Starter

£200 for 3 years at 10%

Simple



Compound

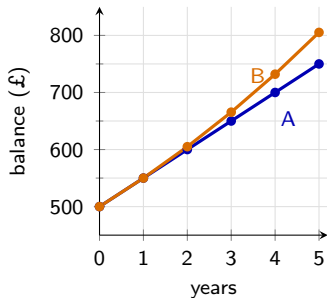


Simple interest adds the same amount every year; compound interest uses the new balance.

Year	Simple	Compound
1	£220	£220
2	£240	£242
3	£260	£266.20

- Write 3% as a decimal and 0.045 as a percentage. **0.03 and 4.5%**
- Write $\frac{1}{40}$ as a percentage. **2.5%**
- Write the missing balances in the boxes and in the table.
- Find the simple interest on £1200 at 5% for 4 years. **£60 a year, so £240**
- Find the value of £4000 after 5 years at 3% compound interest.
 $4000 \times 1.03^5 =$
£4637.10
- Ravi saves £300 for 3 years at either 6% simple or 5% compound. Which pays more? **A: £354; B: $300 \times 1.05^3 = £347.29$, so A pays more.**
- Account A pays 10% simple but holds at most £300. Account B pays 5% simple, no maximum. Dev saves £1000 for 3 years. Which is better, and by how much? **A: £390 plus the £700 that earns nothing, so £1090. B: £1150, so B by £60.**

Starter

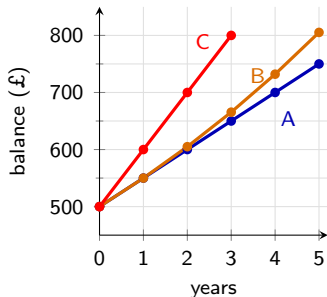


Both accounts start with £500.

1. Write 1.08 as a percentage and 0.6% as a decimal.
2. Write 0.45 as a fraction in its simplest form.
3. Both accounts pay the same rate. Use the graph to find it.
4. Which account pays simple interest, and how can you tell?
5. Account C pays 20% simple interest on £500. Complete the table, then plot the four points on the graph.

Years	0	1	2	3
Balance	£500	_____	_____	_____
6. An account pays 2% compound interest every 6 months. Is that the same as 4% a year? Explain your answer.

Starter



Both accounts start with £500.

- Write 1.08 as a percentage and 0.6% as a decimal. **108% and 0.006**
- Write 0.45 as a fraction in its simplest form. **$\frac{45}{100} = \frac{9}{20}$**
- Both accounts pay the same rate. Use the graph to find it. **After 1 year both hold £550, so £50 on £500, a rate of 10%**
- Which account pays simple interest, and how can you tell? **A, because it rises by the same £50 every year, so the graph is a straight line**
- Account C pays 20% simple interest on £500. Complete the table, then plot the four points on the graph.

Years	0	1	2	3
Balance	£500	£600	£700	£800
- An account pays 2% compound interest every 6 months. Is that the same as 4% a year? Explain your answer. **No. $1.02 \times 1.02 = 1.0404$, so the year's multiplier is 1.0404 and the rate is 4.04%.**