| GCSE - **Numeracy and Mathematics**<br><br>**Topic: Percentage change** | **Tier:** Intermediate | **Grade:**<br><br>**D/C** | GwE |
|---|---|---|---|

**Starter:**

1. Write $\frac{1}{5}$ as a percentage
2. Write $\frac{1}{8}$ as a percentage
3. Write $\frac{23}{50}$ as a percentage
4. Calculate the speed in kmh if you travel 120 km in 3 hrs.
5. Calculate the speed in kmh if you travel 80km in 2 hours 30 mins.

**Skills:**

1. Calculate the percentage increase from 80kg to 100kg.

2. Iolo's heart rate is 85 beats per minute. It increases after exercise to 110 beats per minute. What is the percentage increase in heart rate?

3. Carys is losing weight. Her weight at the start of the month was 75kg. Her weight at the end of the month is 70kg. What is the percentage decrease in weight?

**Top Tips!**

- When finding a percentage change you must compare against the **<u>original</u>**
- $\% \ increase = \frac{increase}{original \ amount} \times 100$
- $\% \ decrease = \frac{decrease}{original \ amount} \times 100$
- You may have to do this with money (profit and loss)
  E.g. Seren gets 45 marks in a test. She then revises, gets help and resits the test. She gets 70 marks in the resit. Calculate Seren's percentage improvement.

  Increase = 70 – 45 = 25 marks
  $\% \ increase = \frac{25}{45} \times 100 = 55.\dot{5}\%$

**Examination Question:**

**2016 November Numeracy U2 Higher Q4a**
Gwenda enjoys road running. She keeps a record of her run each day this week

| Day | Sun | Mon | Tues | Wed | Thurs | Fri | Sat |
|---|---|---|---|---|---|---|---|
| Distance | 4.6 | 5.4 | 2.2 | 6.2 | 7.2 | 2.2 | 3.4 |
| Time | 26 | 31 | 12 | 35 | 40 | 14 | 22 |

*All distances are in km, all times are in minutes*

Last week, her average speed for the week was 9. 6 kilometres per hour. Calculate Gwenda's percentage improvement in her average speed from last week to this week. You must show all your working. [6+2]

| **Assessment for Learning** | **Video / QR code** |
|---|---|

| GCSE - **Numeracy and Mathematics**<br><br>**Topic: Percentage change** | **Tier:** **Intermediate** | **Grade:**<br><br>**D/C** | GwE |
|---|---|---|---|

**Starter:**

1. Write $\frac{1}{5}$ as a percentage
   20%
2. Write $\frac{1}{8}$ as a percentage
   12.5%
3. Write $\frac{23}{50}$ as a percentage
   46%
4. Calculate the speed in kmh if you travel 120 km in 3 hrs.
   40kmh
5. Calculate the speed in kmh if you travel 80km in 2 hours 30 mins.
   32kmh

**Skills:**

1. Calculate the percentage increase from 80kg to 100kg.
   Increase = 20kg
   % increase =
   20kg ÷ 80kg × 100 = 25%
2. Iolo's heart rate is 85 beats per minute. It increases after exercise to 110 beats per minute. What is the percentage increase in heart rate?
   Increase = 25 beats per min
   % increase =
   25kg ÷ 85kg × 100 = 29.4%
3. Carys is losing weight. Her weight at the start of the month was 75kg. Her weight at the end of the month is 70kg. What is the percentage decrease in weight?
   Decrease = 5kg
   % decrease = 5kg ÷ 75kg × 100 = 6.7%

**Top Tips!**

- When finding a percentage change you must compare against the **original**
- $\% \; increase = \frac{increase}{original \; amount} \times 100$
- $\% \; decrease = \frac{decrease}{original \; amount} \times 100$
- You may have to do this with money (profit and loss)
  E.g. Seren gets 45 marks in a test. She then revises, gets help and resits the test. She gets 70 marks in the resit. Calculate Seren's percentage improvement.

  Increase = 70 – 45 = 25 marks
  $\% \; increase = \frac{25}{45} \times 100 = 55.\dot{5}\%$

**Examination Question:**

**2016 November Numeracy U2 Higher Q4a**
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| Time | 26 | 31 | 12 | 35 | 40 | 14 | 22 |

*All distances are in km, all times are in minutes*

Last week, her average speed for the week was 9. 6 kilometres per hour. Calculate Gwenda's percentage improvement in her average speed from last week to this week. You must show all your working. [6+2]

Total distance = 31.2km
Total time = 180 mins
Total time in hours = 3hrs
Average speed for this week = 31.2km ÷ 3 = 10.4kmh
Increase in speed = 10.4kmh – 9.6kmh = 0.8kmh
Percentage improvement = 0.8kmh ÷ 9.6kmh × 100 = 8.3333…%

| **Assessment for Learning** | **Video / QR code** |
|---|---|