

Number and Number processes

| Level 2 | Level 3 | Level 4 |
|---|--|--|
| <p>1. Write eight hundred and three thousand, four hundred and seven as a number.</p> <p>2. Calculate:</p> <p>a) $436.5 + 258.72$</p> <p>b) $439.7 - 128.83$</p> <p>c) 3789.2×7</p> <p>d) $2689.29 \div 3$</p> <p>3. Calculate:</p> <p>(a) 5000×400</p> <p>(b) 65.3×1000</p> <p>(c) 45×23</p> <p>4. A 1 metre piece of wood must be cut into eight equal parts. Find the length of each piece of wood.</p> <p>5. The temperature was -4°C. It then rose by 6°C. What is the new temperature?</p> <p>Addition/subtracting using the number line</p> | <p>1. Calculate:</p> <p>a) $5.2 - 12.861 + 8.9$</p> <p>b) 0.8×0.02</p> <p>c) $36 \div 0.6$</p> <p>2. Calculate:</p> <p>a) 0.649×800</p> <p>b) $450.1 \div 7000$</p> <p>3. Complete the following calculations:</p> <p>a) $-9 - (-5)$</p> <p>b) $4 \times (-8)$</p> <p>c) $-49 \div (-7)$</p> | <p>1. To feed some animals in a zoo 6.3 kg of rice was mixed with 4.17 kg of vegetables. The animals ate 8 kg of feed. How much feed is left?</p> <p>2. 874 cans of fizzy juice are to be sold in containers which can hold 9 cans. How many containers are needed to hold all the cans of fizzy juice?</p> <p>3. Evaluate:</p> $12^2 - 4(5 - 2) + 7$ |

Addition/subtraction to 2 decimal places

- Multiplying/dividing whole numbers by multiples of 10
- Multiplying/dividing decimals by powers of 10
- Long multiplications (2 digits)

Calculations involving all operations include numbers up to 3 decimal places

Multiplying/dividing decimals by multiples of 10

Performs calculations involving integers using all 4 operations

Interprets and solves problems involving all operations

Performs calculations including the 4 operations using BODMAS

Estimation and Rounding

Level 2

1. Round 3406.62 to:
 - (a) the nearest hundred
 - (b) one decimal place

- Rounds whole numbers to 1000, 10000 and 100000
- Rounds decimals up to 2 decimal places

Level 3

1. Round the number 123.456789 to three decimal places.

Round to 3 decimal places

2. Give an estimate for the calculation

$$8.95 \times 7.14$$

Uses rounding to routinely estimate the answers to calculations

Level 4

1. Screws are manufactured that must have a tolerance of (20 ± 5) mm. What are the maximum and minimum lengths of screws that are acceptable?

Uses a given tolerance to make decision about acceptable ranges

2. Round 785400 to 2 significant figures

Rounds answers to a specified significant figure

Fractions, Decimals and Percentages

| Level 2 | Level 3 | Level 4 |
|--|---|--|
| <p>1. A £30 shirt has 20% off in the January sales. How much money do you save?</p> <p>Solves problems using basic percentages: 10%, 20%, 50%, 75%</p> <p>2. Calculate $\frac{2}{3}$ of 18kg</p> <p>3. Calculate 15% of £200</p> <p>4. Write 25% as decimal fraction and a simplified fraction</p> <ul style="list-style-type: none"> Calculates fraction of a quantity Calculates simple percentages of a quantity Converts between fractions, percentages and decimals | <p>1. Calculate 40% of £35 without a calculator.</p> <p>Solves problems involving percentages without a calculator</p> <p>3. Simplify the ratio 24 : 40</p> <p>4. On a farm, the ratio of sheep to cows is 5 : 8. If there are 32 cows, how many sheep are there?</p> <p>5. 8 cans of cola cost £6.40. How much does it cost for 3 cans of cola?</p> <p>Solves problems involving ratio and direct proportion</p> <p>6. Which of these fractions are equivalent to $\frac{1}{8}$?</p> <p>$\frac{2}{14}$ $\frac{3}{24}$ $\frac{4}{40}$ $\frac{5}{45}$ $\frac{6}{48}$</p> | <p>1. Use division to express the following fraction as a recurring</p> $\frac{5}{6}$ <p>2. In a school there are 288 pupils and 12 teachers. What percentage of the school are teachers?</p> <p>Represents quantities as fractions and convert to decimals and percentages</p> <p>3. (a) Increase 180 grams by 25% (b) Decrease \$900 by 23%</p> <p>Calculates percentage increase/decrease</p> <p>4. It takes 4 people 12 hours to build a wall. How long would it take to build the wall if there were 6 people?</p> <p>Solves problems involving indirect proportion</p> |

| Time | | |
|--|--|--|
| Level 2 | Level 3 | Level 4 |
| <p>1. Write 1305 in 12 hour format.</p> <p>2. Change $2\frac{3}{4}$ hours into minutes.</p> <p>3. A film starts at 1406 and end at 1508. How long does the film last?</p> <p>4. Change 187 minutes into minutes and seconds.</p> <p>5. My plane to Lanzarote leaves Glasgow airport at 0035 on Monday 15th January. I must check-in for my flight at least 2 hours before departure. When is the latest I can arrive at the airport?</p> <ul style="list-style-type: none"> • Converts between 12hr and 24 hr time • Converts between hours, minutes and seconds • Calculates durations of activities across several hours and minutes. | <p>1. How long did a train take to travel 700 miles when travelling at an average speed of 80 mph?</p> <p>Calculates speed, distance and time</p> <p>2. Term 3 starts Monday 8th January at 8.50pm and finishes at Thursday 29th March at 3.05pm. How long is Term 3?</p> <p>Calculates time durations across hours and days</p> | <p>1. A plane flies 936km in 3 hours 54 minutes. What is its average speed?</p> <p>2. An overnight ferry left Lerwick at 1835 and arrived at Aberdeen at 0711 the next morning. The distance from Lerwick to Aberdeen is 226.8 miles. What was the average speed of the ferry?</p> <p>3. Calculate the time taken for an athlete to complete a 10K race, running at an average speed of 8km/h.</p> <p>Calculates speed, distance and time involving decimal fraction hours</p> |

6. A lorry travels a distance of 100 miles in 2 hours. How far will it travel in 3 hours?

Estimates the duration of a journey using the link between speed, distance and time

Measurement

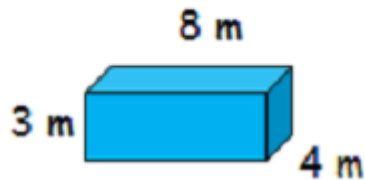
Level 2

1. Change the following units into metres:

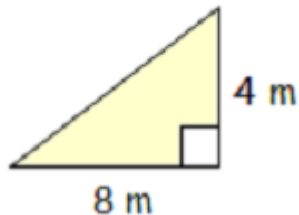
- (a) 20cm
- (b) 3000mm

Converts between
units of
measurement

2. Calculate the following volume of the following cuboid...

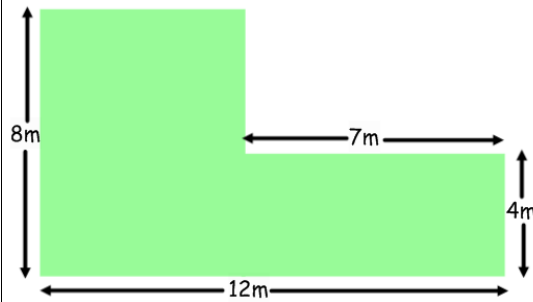


3. Calculate the area of the triangle below...



Level 3

1. Calculate perimeter and area of the shape below.



Chooses appropriate units for length, area and volume

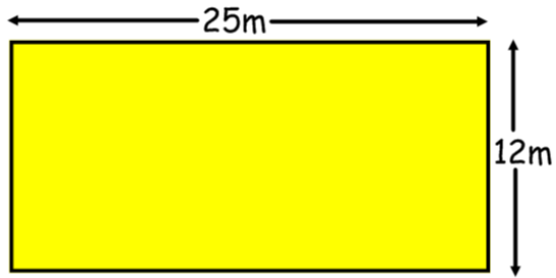
Level 4

1. John fills a kettle with 1.5 litres of water to make 8 cups of tea. Assuming that each cup of tea is equal in volume, how much liquid to the nearest millilitre should each cup contain?

Demonstrates the impact of truncation and premature rounding

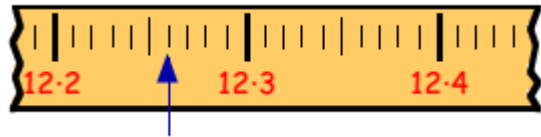
4.

Calculate the area and perimeter of the rectangle



- Calculates area of rectangle and squares
- Calculates perimeter of 2D shapes
- Calculates area of right angled triangles
- Calculates the volume of cubes and cuboids

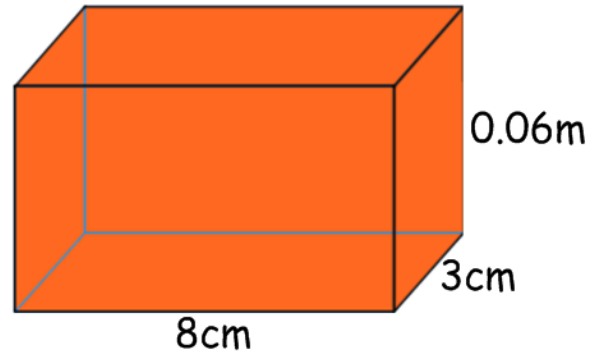
5. Write down the number the arrow is pointing to on the scale below



Reading a variety of scales accurately

2.

Calculate the volume of the shape below



Converts between units (to 3 decimal places) and uses it solve problems

Data and Analysis

Level 2

1. Conduct a survey on your classmates about the primary school they went to. Display the results using a:

- Tally chart
- Frequency table
- Bar graph
- Pie chart

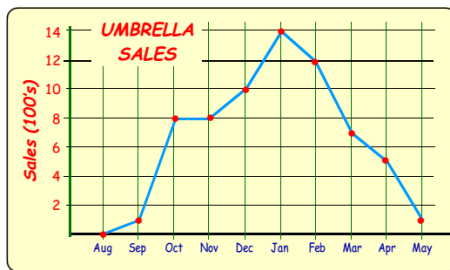
2. Pour freshly boiled water into a cup and measure the temperature. Continue to record the temperature every 5 minutes for 30 minutes. Record the results using a line graph.

Collect data and produces statistical diagrams

Level 3

1.

This line graph shows the number of umbrellas sold (in 100's) by Grace Bros from August 2012 until May 2013.



- Why are sales so low in August ?
- During which two consecutive months do sales remain the same ?
- Between which two consecutive months did sales –
 - rise the most
 - fall by the most ?
- When are sales at their maximum ? Why ?
- Why do sales appear to fall after January ?
- Grace Bros sell some umbrellas in May - but not a lot ! How many ?
- What was the general "trend" of the graph after January ?



Describes trends in data

Level 4

1. The table below shows the results of test scores from a group of S3 pupils.

| Pupil | Ed | Kim | Joe | Ann | Lyn | Bob | Tom |
|-----------|----|-----|-----|-----|-----|-----|-----|
| Chemistry | 5 | 20 | 40 | 40 | 50 | 40 | 10 |
| Biology | 5 | 25 | 10 | 35 | 40 | 50 | 10 |

- Record the results of the table below in a scatter graph
- Is there a correlation between the chemistry scores and biology score? If so describe the correlation.

Uses statistical language to describe relationships

Ideas of chance and uncertainty

| Level 2 | Level 3 | Level 4 |
|--|--|--|
| <p>1. Using the vocabulary of probability, describe the outcome of the following events:</p> <ul style="list-style-type: none">a) The sun will rise in the morningb) The September weekend will be in June next year <div data-bbox="203 767 840 922" style="border: 1px solid black; padding: 5px; margin-top: 10px;"><p>Uses the language of probability accurately to describe the likelihood of an event occurring e.g. 50/50; one in two</p></div> | <p>1. What is the probability of rolling a dice and getting a score less than 3?</p> <p>2. There are 5 dogs, 2 cats and 1 rabbit in a vet's waiting room. What is the probability that the next animal the vet will examine is a cat?</p> <div data-bbox="882 724 1516 831" style="border: 1px solid black; padding: 5px; margin-top: 10px;"><p>Calculates the probability of a simple event happening as a fraction</p></div> | <p>1. James bought 12 raffle tickets from a book with 150 tickets. Scott bought 30 raffle tickets from a book with 200 tickets. Who is more likely to win?</p> <div data-bbox="1541 635 2123 735" style="border: 1px solid black; padding: 5px; margin-top: 10px;"><p>Calculates probability and makes decisions based on comparisons</p></div> <p>2. A dartboard is numbered 1-20. What is the probability of scoring less than 20 as a fraction, decimal and percentage?</p> |

Money

Level 2

1. I go to a shop and buy 2 t-shirts costing £15 each, a pair of trainers at £49.99 and a pair of shorts at £17.99. What is my total bill?

Money calculations including all 4 operations

2. I have £16 to spend on a three course meal. Use the menu below to write down the dishes I can order using my £16 budget.

Starter

Soup £3.80
Mushrooms £4.40
Bread £2.70

Main

Curry £9.90
Fish and Chips £7.80
Steak £14.20





Dessert

Ice-cream £3.50
Stick toffee pudding £4.10
Apple pie £5.60

Compares costs and determines affordability within a budget

Level 3

1. For this set of offers, calculate which one is the "best buy"...

| | |
|---|--|
|  Closing Down Sale! 20% Off All Marked Prices  £340 |  Everything Must Go! 25% Off All Marked Prices  £365 |
|---|--|

Demonstrates understanding of best value

2. What is the hire purchase price of a washing machine which requires a £90 deposit and 8 weekly payments of £40.

Level 4

1. John earns £11.80 per hour as a long distance lorry driver. Last week he worked 40 hours.

- Calculate John's gross pay for the week.
- His deductions last week come to £98.50. Calculate John's net pay.

Calculates net income

3.

Shop A: £1 = \$1.2

(3% commission fee applied)

Shop B: £1 = \$1.15

(no commission)

Which shop offers the best deal when exchanging £500 into US dollars?







Converts between different currencies and determines the best deal

3. A man bought a painting for £12000 and sold it to a private collector for £18500. How much profit did he make?

Calculates profit and loss

3.

Using the exchange rate provided;

| Exchange Rates :- | | | |
|---|----------------|---|------------------|
|  | £1 = €1.23 |  | £1 = 10.2 yuan |
|  | £1 = \$1.62 |  | £1 = 85.7 rupees |
|  | £1 = 129.9 yen |  | £1 = 2.85 lira |

change the following currencies...

(a) £5.32 → ? dollars

(b) 299.95 rupees → £?

Converts between different currencies