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Name

Your score

/ 120 =

%

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SEAM Series of Educational Maths



Problem Solving

24

Intermediate





Ready!

Percentages

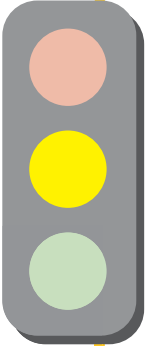
- A What is 20% of 400?
- B There are 18 girls in a class of 30.
What percentage are boys?
- C Write $\frac{3}{5}$ as a percentage.
- D Eddy borrowed 25% of books from his brother's bookshelf which had a total of 120 books. How many books did Eddy borrow?

Volume and Surface Area

- E What is the volume of a cube that is 2cm long?
- F What is the surface area of a cube that is 3cm long?
- G How many litres of water can fit into a tank that is 2m long, 1.5m wide and 1m deep?



$1\text{m}^3 = 1000 \text{ litres}$



Mean, Range, Median and Mode

Tim compared the daily temperature of Barcelona with the daily temperature in London for 7 days. Find out the mean, range, median and mode temperature of each city and answer the questions below.

Unit = °C

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Barcelona	27	25	29	31	30	32	29
London	15	14	15	13	16	15	10

H What is the mean temperature of Barcelona?

I What is the median of the temperature in Barcelona?

J What is the mode temperature in Barcelona?

K What is the mean temperature of London?

L What is the difference between the mean temperatures of Barcelona and London?

M What is the difference between the range of temperature of Barcelona and London?



Go! Go!

Show me your working out.

- A Helen spent $\frac{1}{4}$ of her pocket money. If she had £90 at the start, what percentage of her pocket money does she now have left? How much is it?

Convert $\frac{1}{4}$ to percentage.

- B Daniel's family goes out for a meal at their favourite restaurant once a week. Every time they go, the bill comes up to £80. The restaurant gives back 5% of the total bill back in vouchers. How much would Daniel's family get back in vouchers after 12 weeks?

How much does Daniel's family spend at their favourite restaurant for 12 weeks?

- C Jason bought 14 Christmas cards and Mike bought 26. What percentage of the total number of cards did Jason buy?

How many cards are there altogether?

- D** At a sale, the classic guitar was sold for £640. This price was 25% of the original price. What was the original price?

Convert 25% to fraction.

25% of the original price is £640, how much is 75% of the original price?

- E** Pete's art piece is made using 150 shapes. He uses 42 circles, 27 triangles, 36 rectangles and the rest with star shapes to build his piece. What is the percentage of the number of star pieces he used to make the art piece?

How many star shapes are there?

What is the fraction of star shapes?

- F** A cube measures 12cm in length has a cuboid hole that goes through from end to end of the cube. If the length of the empty surface of the cuboid hole is 2cm by 4cm, what is the volume of the cube that has a cuboid hole in the middle?

What is the volume of the cube?

What is the volume of the cuboid hole?



Go! Go!

- G** A return flight from London to Seoul costs £650 for an adult. A child ticket cost 70% of an adult ticket. How much would the total be for one adult and 2 children?

- H** A pair of socks costs £1.50. If you buy more than 10, you get a 5% discount on the price. How much would it cost to buy 30 pairs of socks?

- I** A cardboard box has a volume of $75,000\text{cm}^3$. It is designed to hold 30 boxes of chocolates. What is the height if each box of chocolate is 20cm long and 5cm wide?

- J** 1cm^3 cubes are stacked to make a $5 \times 5 \times 5$ cube. If one cube from each face is removed, what volume of cubes are left?

Norman had bought 3 different plants and checked daily how much each plant had grown over 10 days. The decimal numbers in the table show the length each plant had grown each day. Calculate the total growth of each plant in the 'TOTAL' column.

Unit = mm

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	TOTAL
Plant A	3.2	5.5	5.5	4.6	5.0	5.2	5.4	3.5	4.2	5.9	
Plant B	4.1	5.2	4.2	5.6	4.8	4.9	4.1	5.4	5.3	4.4	
Plant C	3.7	7.2	6.5	5.3	5.5	6.1	4.6	6.9	4.2	7.5	

- K** What is the modal growth of Plant A?
- L** What is the mean growth of Plant B?
- M** What is the median growth of Plant C?
- N** What is the range of growth of Plant A?
- O** Which plant has the highest mean growth?
- P** Which plant has the highest range of growth?



- A** 6 local schools participate in the county hockey league. The scores of each school are shown below. Find out the mean score of each school then circle the school that has the highest score.

Sutton Grammar School

5	6	7	8	9	10	4
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Holy Cross School

7	5	7	8	6	5	4
---	---	---	---	---	---	---

Hollyfield School

6	7	6	8	7	10	5
---	---	---	---	---	----	---

Southborough School

9	8	13	4	12	5	5
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Greenshaw School

4	7	1	2	10	4	7
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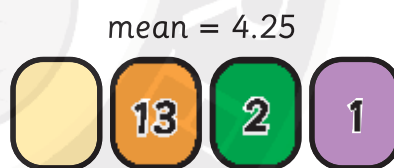
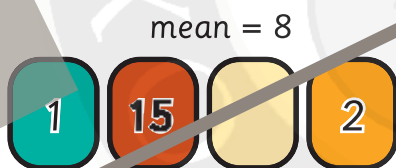
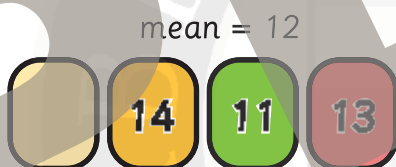
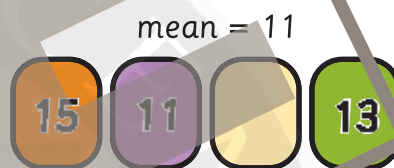
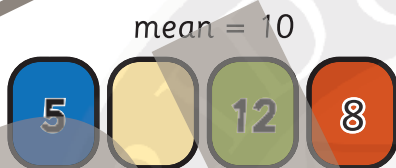
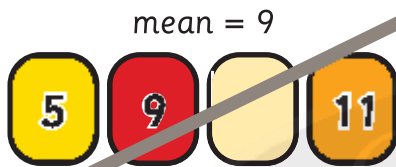
Surbiton High School

12	8	9	8	7	11	6
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- B** The children in class 5 are throwing dice. Each number on the card is the total number of the two dice. Each child throws 6 times. Find their total and the average (mean) of the two dice.



- C** If the mean number for each set is given, what is the missing number in each of these sets?



- D** Find the median (middle number) in each question.

5, 7, 9, 13

12, 12, 22, 32

5, 7, 7, 9, 11, 11

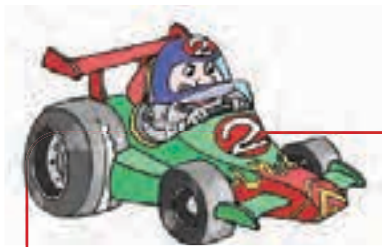
5, 6, 6, 6, 8, 8, 9, 9

5, 5, 6, 7, 9, 10, 11, 12, 13, 14

6, 9, 11, 15, 16, 16, 17, 20

10, 11, 11, 12, 13, 13, 14, 15

18, 18, 22, 28, 28, 29



Cooldown

Write each of these as a decimal into a fraction and give your answer in simplest form.

$0.1 = \frac{\quad}{\quad}$

$0.85 = \frac{\quad}{\quad}$

$0.12 = \frac{\quad}{\quad}$

$0.62 = \frac{\quad}{\quad}$

$0.3 = \frac{\quad}{\quad}$

$0.18 = \frac{\quad}{\quad}$

$0.34 = \frac{\quad}{\quad}$

$0.2 = \frac{\quad}{\quad}$

$0.94 = \frac{\quad}{\quad}$

$0.05 = \frac{\quad}{\quad}$

$0.35 = \frac{\quad}{\quad}$

$0.64 = \frac{\quad}{\quad}$

$0.16 = \frac{\quad}{\quad}$

$0.75 = \frac{\quad}{\quad}$

$0.28 = \frac{\quad}{\quad}$

$0.8 = \frac{\quad}{\quad}$

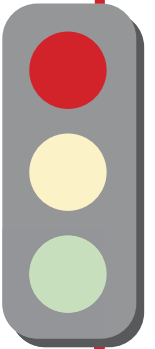
$0.36 = \frac{\quad}{\quad}$

$0.9 = \frac{\quad}{\quad}$

$0.74 = \frac{\quad}{\quad}$

$0.04 = \frac{\quad}{\quad}$

Calculate these divisions by using the long division. (Some of them have reminders)



2	7	1	2
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3	8	1	3
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4	9	2	5
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5	3	6	1
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6	4	7	2
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7	6	8	3
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8	7	9	4
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9	8	0	5
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8	9	1	7
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7	2	8	9
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6	3	9	2
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Homework

Convert improper fractions into mixed fractions.

$$\frac{17}{7} = \square \frac{\square}{7}$$

$$\frac{46}{5} = \square \frac{\square}{5}$$

$$\frac{13}{6} = \square \frac{\square}{6}$$

$$\frac{22}{4} = \square \frac{\square}{4}$$

$$\frac{35}{8} = \square \frac{\square}{8}$$

$$\frac{38}{9} = \square \frac{\square}{9}$$

$$\frac{8}{3} = \square \frac{\square}{3}$$

$$\frac{36}{7} = \square \frac{\square}{7}$$

$$\frac{45}{11} = \square \frac{\square}{11}$$

$$\frac{22}{9} = \square \frac{\square}{9}$$

$$\frac{17}{5} = \square \frac{\square}{5}$$

$$\frac{35}{10} = \square \frac{\square}{10}$$

Convert minutes into hours and minutes. Do not forget to write the unit.

$$278 \text{ mins} =$$

$$391 \text{ mins} =$$

$$573 \text{ mins} =$$

$$68 \text{ mins} =$$

$$75 \text{ mins} =$$

$$86 \text{ mins} =$$

$$569 \text{ mins} =$$

$$214 \text{ mins} =$$

$$81 \text{ mins} =$$

$$453 \text{ mins} =$$