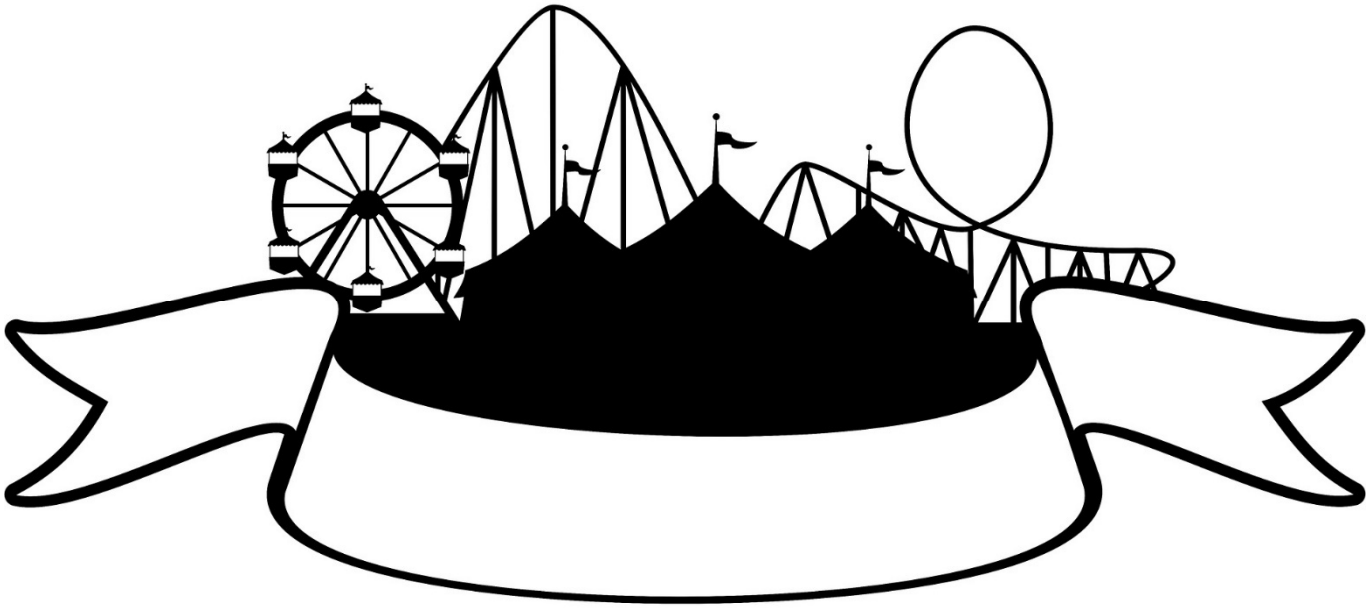
Functional Skills – Level 1 Maths
Theme Park Project



October 2019.

Kindly contributed by Marc Stewart, Peterborough Regional College.
Search for Marc on www.skillsworkshop.org

This resource includes and combines resources from many excellent free websites. Please refer to the author's acknowledgements and sources on page 104.

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THANK YOU 😊

L1 Functional Maths – Theme Park Project Curriculum mapping

Subject content – Reformed FUNCTIONAL SKILLS MATHEMATICS (effective from Sept 2019)

✓ indicates main **content** and **problem-solving skill(s)** covered in this resource, although these will vary with the student group and how the resource is used by the teacher. → or ← = not covered but included to show progression across levels (*content at each level subsumes and builds upon the content at lower levels).*
Full content at: DfE (Feb 2018) https://www.gov.uk/government/publications/functional-skills-subject-content-mathematics

1. Fundamental mathematical knowledge and skills These must be demonstrated in their own right, **both with and without a calculator**, in addition to being used to solve problems or complete tasks.

Entry Level 3	Level 1	Level 2
Using numbers and the number system (N)		
E3.1 Count, read, write, order and compare numbers up to 1000 → E3.2 Add and subtract using three-digit whole numbers ✓ p24 E3.3 Divide three-digit whole numbers by single and double digit whole numbers and express remainders ✓ p24 E3.4 Multiply two-digit whole numbers by single and double digit whole numbers → E3.5 Approximate by rounding numbers less than 1000 to the nearest 10 or 100 and use this rounded answer to check results → E3.6 Recognise and continue linear sequences of numbers up to 100 ✓ p17 p22 E3.7 Read, write and understand thirds, quarters, fifths and tenths including equivalent forms ✓ p34-35, 42, 84 E3.8 Read, write and use decimals up to two decimal places ✓ p43, 45 E3.9 Recognise and continue sequences that involve decimals	L1.1 Read, write, order and compare large numbers (up to one million) p12-14, 19, 44 L1.2 Recognise and use positive and negative numbers ✓ pp15-16, 18 L1.3 Multiply and divide whole numbers and decimals by 10, 100, 1000 ✓ p21-22 L1.4 Use multiplication facts and make connections with division facts L1.5 Use simple formulae expressed in words for one or two-step operations ✓ p25 L1.6 Calculate the squares of one-digit and two-digit numbers ✓ p31-33, 40 L1.7 Follow the order of precedence of operators ✓ p25, 28-29 L1.8 Read, write, order and compare common fractions and mixed numbers ✓ p34, 36, 38, 42, 57 1.9 Find fractions of whole number quantities or measurements ✓ p39, 48 L1.10 Read, write, order and compare decimals up to three decimal places ✓ p43-45 L1.11 Add, subtract, multiply and divide decimals up to 2 decimal places ✓ p46 L1.12 Approximate by rounding to a whole number or to one or two decimal places ✓ p47 L1.13 Read, write, order and compare percentages in whole numbers ✓ p50-51 1.14 Calculate percentages of quantities, including simple percentage increases / decreases by 5% and multiples thereof ✓ p52-53, 56, 59 L1.15 Estimate answers to calculations using fractions and decimals L1.16 Recognise and calculate equivalences between common fractions, percentages and decimals ✓ pp35-37, 58, 64 L1.17 Work with simple ratio and direct proportions ✓ p61-66	L L2.1 Read, write, order and compare positive and negative numbers of any size ✓ p18 L2.2 Carry out calculations with numbers up to one million including strategies to check answers including estimation and approximation ✓ p18 L2.3 Evaluate expressions and make substitutions in given formulae in words and symbols ✓ p25-29, 33, 40 L2.4 Identify and know the equivalence between fractions, decimals and percentages ✓ p37, 58 L2.5 Work out percentages of amounts and express one amount as a percentage of another ← L2.6 Calculate percentage change (any size increase and decrease), and original value after percentage change ✓ p52, 54, 59 L2.7 Order, add, subtract and compare amounts or quantities using proper and improper fractions and mixed numbers ✓ p37 L2.8 Express one number as a fraction of another ✓ p48 L2.9 Order, approximate and compare decimals L2.10 Add, subtract, multiply and divide decimals up to three decimal places ← L2.11 Understand and calculate using ratios, direct proportion and inverse proportion ✓ p65-66 L2.12 Follow the order of precedence of operators, including indices ← **Not covered/required in Functional Skills Maths but useful for progression to GCSE.** P23 (primes & prime factors)

L1 Functional Maths – Theme Park Project Curriculum mapping

1. Fundamental mathematical knowledge and skills These must be demonstrated in their own right, **both with and without a calculator**, in addition to being used to solve problems or complete tasks.

Entry Level 3	Level 1	Level 2
Using common measures, shape and space (MSS)		
E3.10 Calculate with money using decimal notation & express money correctly in writing in pounds and pence → E3.11 Round amounts of money to the nearest £1 or 10p E3.12 Read, measure and record time using am and pm E3.13 Read time from analogue and 24 hour digital clocks in hours and minutes → E3.14 Use and compare measures of length, capacity, weight and temperature using metric or imperial units to the nearest labelled or unlabelled division E3.15 Compare metric measures of length including millimetres, centimetres, metres and kilometres E3.16 Compare measures of weight including grams and kilograms E3.17 Compare measures of capacity including millilitres and litres E3.18 Use a suitable instrument to measure mass and length E3.19 Sort 2-D and 3-D shapes using properties including lines of symmetry, length, right angles, angles including in rectangles and triangles → E3.20 Use appropriate positional vocabulary to describe position and direction inc. eight compass points and including full/half/quarter turns →	L1.18 Calculate simple interest in multiples of 5% on amounts of money ✓ p59 L1.19 Calculate discounts in multiples of 5% on amounts of money ✓ p68 L1.20 Convert between units of length, weight, capacity, money and time, in the same system ✓ p69-70, 72, 74, 101 L1.21 Recognise and make use of simple scales on maps and drawings ✓ p77 L1.22 Calculate area and perimeter of simple shapes including those that are made up of a combination of rectangles ✓ p27, 69-70, 80 L1.23 Calculate the volumes of cubes and cuboids ✓ p69-70,81 L1.24 Draw 2-D shapes and demonstrate an understanding of line symmetry & knowledge of the relative size of angles ✓ p71, 82-83 L1.25 Interpret plans, elevations and nets of simple 3-D shapes ✓ p76-77, 86 L1.26 Use angles when describing position and direction, and measure angles in degrees ✓ p76, 88-89	L2.13 Calculate amounts of money, compound interest, percentage increases, decreases and discounts including tax and simple budgeting ✓ p68 L2.14 Convert between metric and imperial units of length, weight and capacity using a a) conversion factor and b) conversion graph L2.15 Calculate using compound measures including speed, density and rates of pay ✓ p72 L2.16 Calculate perimeters and areas of 2-D shapes including triangles and circles and composite shapes including non-rectangular shapes (formulae given except for triangles and circles) ✓ p27 L2.17 Use formulae to find volumes and surface areas of 3-D shapes including cylinders (formulae to be given for 3-D shapes other than cylinders) L2.18 Calculate actual dimensions from scale drawings and create a scale diagram given actual measurements ✓ p75 L2.19 Use coordinates in 2-D, positive & negative, to specify the positions of points L2.20 Understand and use common 2-D representations of 3-D objects L2.21 Draw 3-D shapes to include plans and elevations ✓ p85, 87 L2.22 Calculate values of angles and/or coordinates with 2-D and 3-D shapes

1. Fundamental mathematical knowledge and skills These must be demonstrated in their own right, **both with and without a calculator**, in addition to being used to solve problems or complete tasks.

Entry Level 3	Level 1	Level 2
Handling information and data (HD)		
E3.21 Extract information from lists, tables, diagrams and charts and create frequency tables ✓ p91-94, 96, 101 E3.22 Interpret information, to make comparisons and record changes, from different formats including bar charts and simple line graphs E3.23 Organise and represent information in appropriate ways including tables, diagrams, simple line graphs and bar charts	L1.27 Represent discrete data in tables, diagrams and charts including pie charts, bar charts and line graphs ✓ p48, 95 L1.28 Group discrete data and represent grouped data graphically L1.29 Find the mean and range of a set of quantities ✓ p98 L1.30 Understand probability on a scale from 0 (impossible) to 1 (certain) and use probabilities to compare the likelihood of events ✓ p99 L1.31 Use equally likely outcomes to find the probabilities of simple events and express them as fractions ✓ p99	L2.23 Calculate the median and mode of a set of quantities L2.24 Estimate the mean of a grouped frequency distribution from discrete data L2.25 Use the mean, median, mode and range to compare two sets of data L2.26 Work out the probability of combined events including the use of diagrams and tables, including two-way tables ✓ p100 L2.27 Express probabilities as fractions, decimals and percentages ✓ p99 L2.28 Draw and interpret scatter diagrams and recognise positive and negative correlation

L1 Functional Maths – Theme Park Project Curriculum mapping

2. Mathematical problem solving (at all levels of Functional Mathematics)

Although underpinning knowledge is tested in its own right, problem solving is a core element of Functional Skills mathematics yet should not obscure or add additional mathematical complexity beyond the level of the qualification. Defining problem solving is a challenge but the attributes below may help. Not all (often just one) of the listed attributes must be present in a single task for it to be considered to be problem solving. ✓ indicates why all or parts of this resource can be considered to be problem solving.
Source: DfE (Feb 2018) https://www.gov.uk/government/publications/functional-skills-subject-content-mathematics.

One or more of the following attributes may be present in a single task for it to be considered problem solving.	
A Tasks that have little or no scaffolding: there is little guidance given to the student beyond a start point and a finish point. Questions do not explicitly state the mathematical process(es) required for the solution. **E.g. pp 91, 94,**	✓
B Tasks that provide for multiple representations, such as use of a sketch or a diagram as well as calculations. E.g. p 71**5aE.g. p 71, Q8.**	✓
C The information is not given in mathematical form or in mathematical language; or there is a need for the results to be interpreted or methods evaluated, for example, in a real-world context. **Most questions**	✓
D Tasks have a variety of techniques that could be used. **Percentage and time questions. E.g. Q4 & Q6.**	✓
E The solution requires understanding of the processes involved rather than just application of the techniques. **E.**	✓

Solving mathematical problems, carrying out tasks and decision making.

<table>
<tr><th>Entry 1 students</th><th>Entry 2 students</th><th>Entry 3</th><th>Level 1 students</th><th>Level 2 students</th></tr>
<tr><td colspan="5">are expected to be able to:</td></tr>
<tr><td colspan="3">Use the content knowledge and skills to recognise a [1]simple problem and obtain a solution</td><td colspan="2" rowspan="2">Use the content knowledge and skills to recognise and obtain a solution or solutions to a:
[2]straightforward problem. ✓ | [3]complex problem.</td></tr>
<tr><td rowspan="3">E1a. Use given mathematical information and recognise and use simple mathematical terms appropriate to E1</td><td colspan="2" rowspan="2">E2a. E3a. Use given mathematical information including numbers, symbols, simple diagrams and charts</td></tr>
<tr><td colspan="2">L1a. L2a. Read, understand and use mathematical information and mathematical terms used at this level ✓</td></tr>
<tr><td>E2b. Recognise, understand and use simple mathematical terms appropriate to Entry Level 2</td><td>E3b. Recognise, understand and use simple mathematical terms appropriate to Entry Level 3</td><td colspan="2">L1b. L2b. Address individual problems as described above ✓
L1c. L2c. Use knowledge and understanding to a required level of accuracy ✓</td></tr>
<tr><td colspan="3">E1b. E2c. E3c. Use the methods given above to produce, check and present results that make sense [E3 only: to an appropriate level of accuracy].</td><td></td><td>L2d. Identify suitable operations and calculations to generate results. ✓</td></tr>
<tr><td rowspan="3">E1c. Provide a simple explanation for those results.</td><td rowspan="3">E2d. Present appropriate explanations using numbers, measures, simple diagrams, simple charts and symbols appropriate to Entry Level 2.</td><td rowspan="3">E3d. Present results with appropriate explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3. ✓</td><td colspan="2">L1d. L2e. Analyse and interpret answers in the context of the original problem ✓</td></tr>
<tr><td colspan="2">L1e. L2f. Check the sense, and reasonableness, of answers</td></tr>
<tr><td>L1f. Present results with appropriate explanation and interpretation demonstrating simple reasoning to support the process & show consistency with the evidence presented ✓</td><td>L2g. Present results and explain results clearly and accurately demonstrating reasoning to support the process and show consistency with the evidence presented</td></tr>
</table>

Problem solving - further information

[1]A **simple mathematical problem** requires **working through one step or process**. At Entry Level it is expected that students will be able to address individual problems each of which draw upon knowledge and/or skills from **one** MCA (NS, MS or HD). **Context** should be familiar to all students and easily described.

[2]A **straightforward problem** requires students to either work through one step or process **or to work through more than one connected step or process**. Individual problems are based on the knowledge and/or skills in the MCA (i.e. NS, MS or HD). At Level 1 it is expected that the student will be able to address individual problems, some of which **draw upon a combination of any two of the MCA** and require students to make connections between those content areas. **The context** of individual problems at L1 will require some comprehension in order for the student to be able independently to identify and carry out an appropriate mathematical approach.

[3]**A complex problem** requires **a multi-step process, typically requiring planning and working through at least two connected steps or processes**. Individual problems are based on a combination of the knowledge and/or skills from the MCA (NS, MS or HD). At Level 2 it is expected that the student will be able to address individual problems some of which draw upon a combination of **all three MCA** and require students to make connections between those content areas. **The context** of individual problems at L2 will require interpretation and analysis in order for the student to be able independently to identify and carry out an appropriate mathematical process or processes.

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Name: _____

LEVEL 1 MATHS

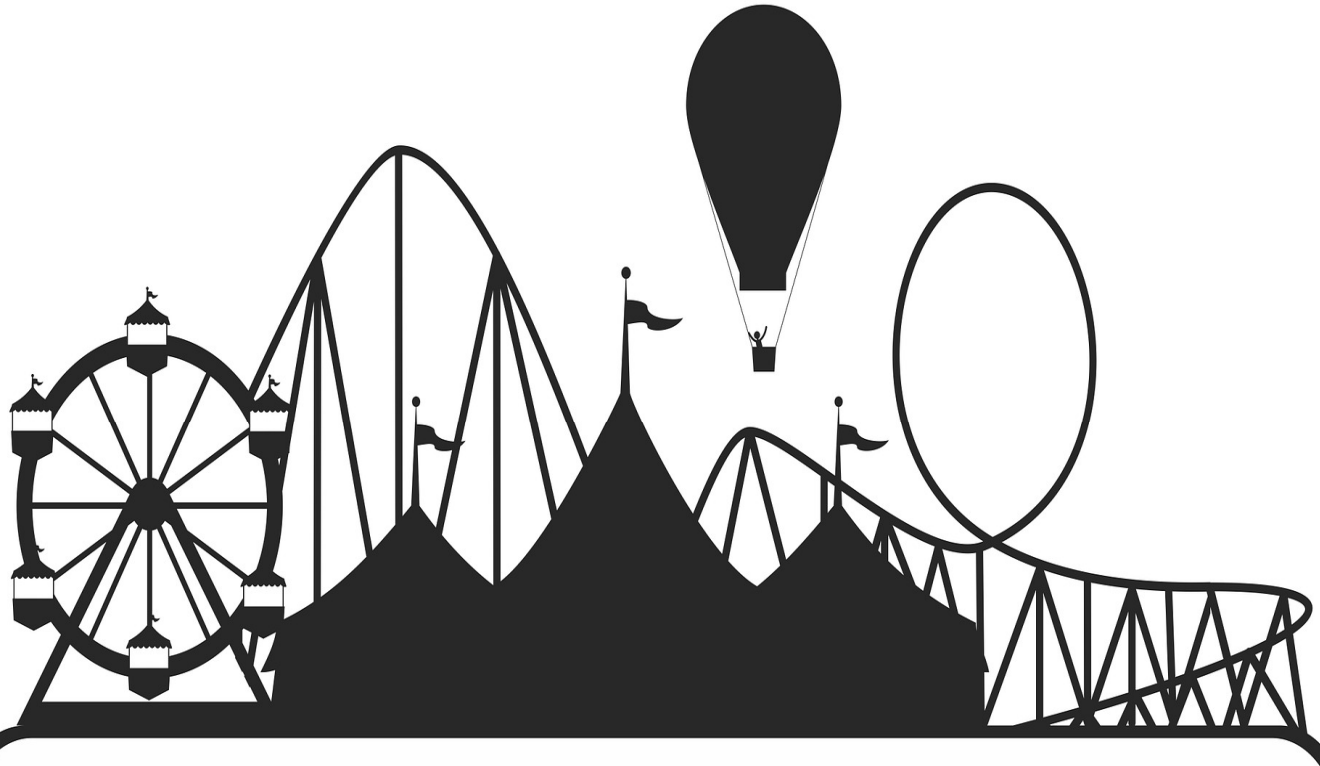
Academic Year _____ to _____

This is your theme park project for this year!

During this course you'll be applying what you learned in your maths classes to the real-world example of building your own theme park.

Each week you will have time to complete part of the book. You will have a record of what you have done, how you have done it, and how you have applied what you have learned in class.

The first thing to do is name your park and write it in the logo above!



Welcome to your amusement park project. This booklet is developed for you to be able to use as a revision aid as well, it covers each of the criteria that you will need to be able to do for your final functional skills level 1 examination. If you miss any lesson, you should complete this booklet as well as any additional work your teacher gives you.

There is also a Google Classroom for this course, where you can find additional material as well as the handouts from each week. This can be found by going to:

https://classroom.google.com and entering the following code : wj7nnz

The resources are available 24/7 from your computer, tablet or mobile device.

Maths is fun because it's about problem solving. When you solve problems, you become more confident and can make better decisions.

Most of all. Have fun during this course! Your amusement park awaits!

CONTENTS:

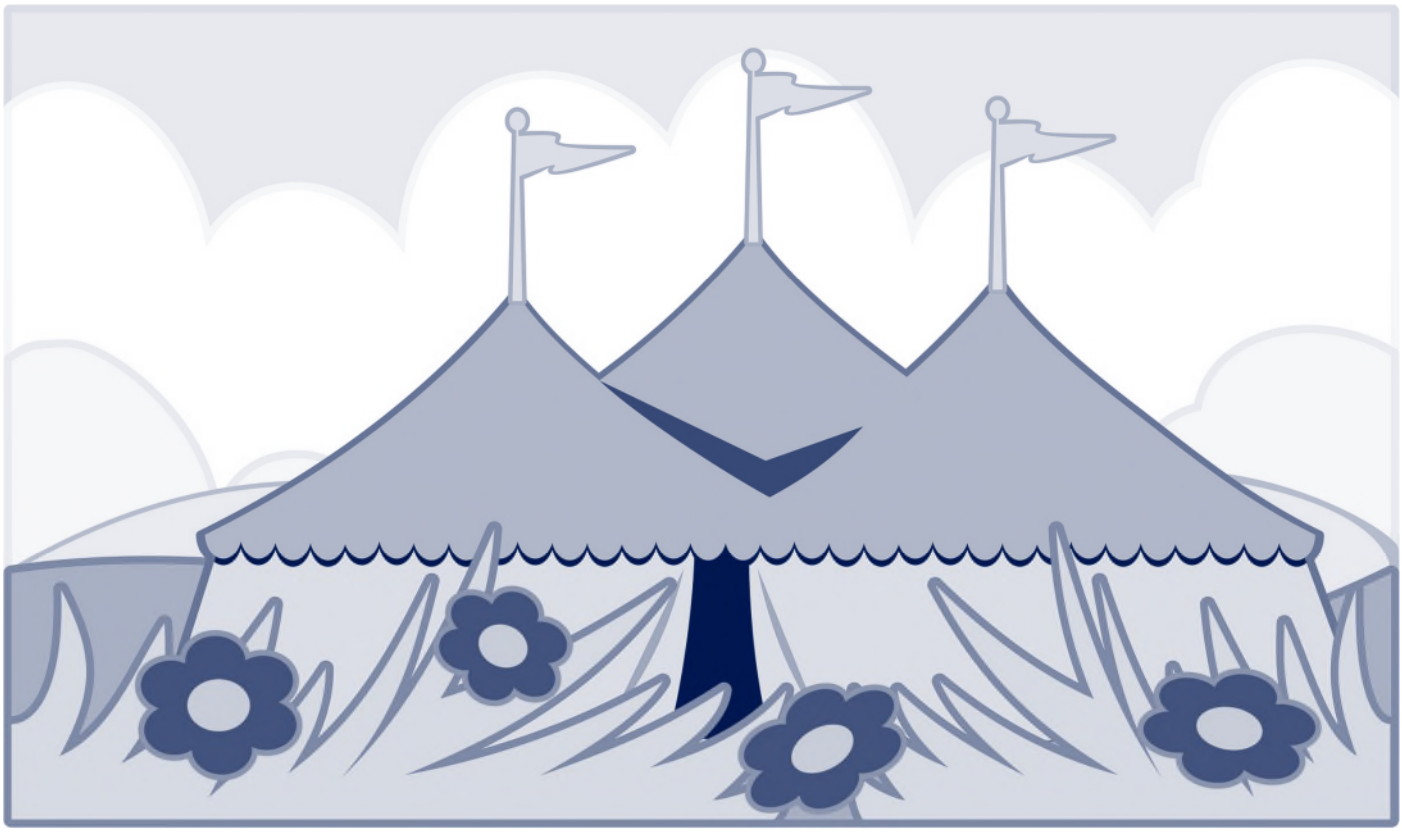
Using numbers and the number system – whole numbers	
approximation	
compare	
constant	
difference	
digit	
exponent	
factor	
fewest	
greater than	
highest	
hundreds	
index	
least	
less than	
millions	
most	
multiple	
multiplicative relationship	
negative	
order	
order of operations (BIDMAS)/(BODMAS)	
place value	
positive	
product	
proportionality	
quotient	
ratio notation	
reverse calculation	
Significant figure	
smallest	
substitution	
sum	
tens	
thousands	
times tables	
variable	

Using numbers and the number system – fractions, decimals, percentages	
common denominator	
Compound interest	
decimal place	
degree of accuracy	
denominator	
discount	
equivalence	
equivalent fraction	
estimation	
fraction	
improper fraction	
interest rate	
mortgage	
numerator	
Percentage increase/ decrease	
place value	
profit margin	
rounding	
savings	
simplifying	
tax	
terminating and recurring decimals	

Using common measures, shape and space	
2-D shapes	
3-D shapes	
acute angle	
angle	
annual interest rate	
area	
axis	
bearings	
centimetres	
circle	
clockwise	
composite shapes	
compound units	
cone	
conversion factor	
conversion graph	
coordinates	
cube	
cubic units	
cuboid	
cylinder	
density	
diameter	
discount	
distance	
edge	
elevation (front and side view)	
faces	
feet	
fluid ounces	
gallons	
grams	
inches	
income	
interest	

investment period	
key	
kilograms	
kilometres	
kite	
line of symmetry	
litres	
mass	
metres	
miles	
millilitres	
millimetres	
mortgage	
net	
obtuse angle	
ounces	
overheads	
parallel	
parallelogram	
pentagon	
perimeter	
perpendicular	
plan (top view)	
pounds	
principal sum	
profit margin	
protractor	
prism	
pyramid	
quadrant	
quadrilateral	
radius	
rebate	
rectangle	
reflex angle	
rhombus	
right angle	

savings	
scale factor	
speed	
spending	
sphere	
square	
square and cubic units	
stone	
straight angle	
surface area	
tax	
time	
trapezium	
triangle	
unit conversion	
vertices	
volume	
yards	



My words

My formulas

Perimeter of a square = 4a

Where a = length of the sides of the square.

Perimeter of a rectangle = 2(l+w)

Where, l = length ; w = width.

Area of a square = a^2

Where a = length of the sides of the square.

Area of a rectangle = lw

Where, l = length ; w = width.

Area of a triangle = ½bh

Where, b = base of the triangle ; h = height of the triangle

Area of a trapezium = ½h(a+b)

Where a = the top side, b = the bottom side, h = height

Area of a circle = πr^2

Where, π = 3.14; r = radius of the circle

Circumference of a circle = 2πr

Where, π = 3.14; r = radius of the circle

Week 1

Learning Outcomes:

L1.1 Read, write, order and compare large numbers (up to one million)

L1.2 Recognise and use positive and negative numbers

Criterion		How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	Read and write numbers up to one million (both written in words and using digits)	/10	/10
B	Explain the value represented by a specific digit in a given number (up to one million)	/10	/10
C	Place numbers up to one million in ascending and/ or descending order	/10	/10
D	Compare numbers up to one million using ‘greater than’ and ‘less than’ symbols	/10	/10
E	Recognise and use positive and negative numbers in practical contexts (e.g. temperature, profit/loss)	/10	/10
F	Count in steps of various sizes, including negative numbers	/10	/10
G	Calculate with positive and negative numbers.	/10	/10

What do I need to work on?:

SECTION A

Read and write numbers up to one million (both written in words and using digits)

Write the following in digits:

1) Sixty-eight thousand, two hundred and fifty-eight _____

2) One thousand, six hundred and ninety-one _____

3) One hundred and sixteen _____

4) Seventy-two thousand, five hundred and forty-six _____

5) Four hundred and thirty-nine thousand, three hundred and twenty-one _____

6) One hundred and fifty-two _____

7) Eight hundred and twenty-nine _____

8) Eight thousand, eight hundred and fifty-five _____

9) One hundred and nineteen thousand, eight hundred and fifty-one _____

10) Nine hundred and ninety-nine thousand, five hundred and sixty-three _____

Write the following in words

1) 10 _____

2) 99,854 _____

3) 659 _____

4) 654,397 _____

5) 12,697 _____

6) 99 _____

7) 3,647 _____

8) 54,314 _____

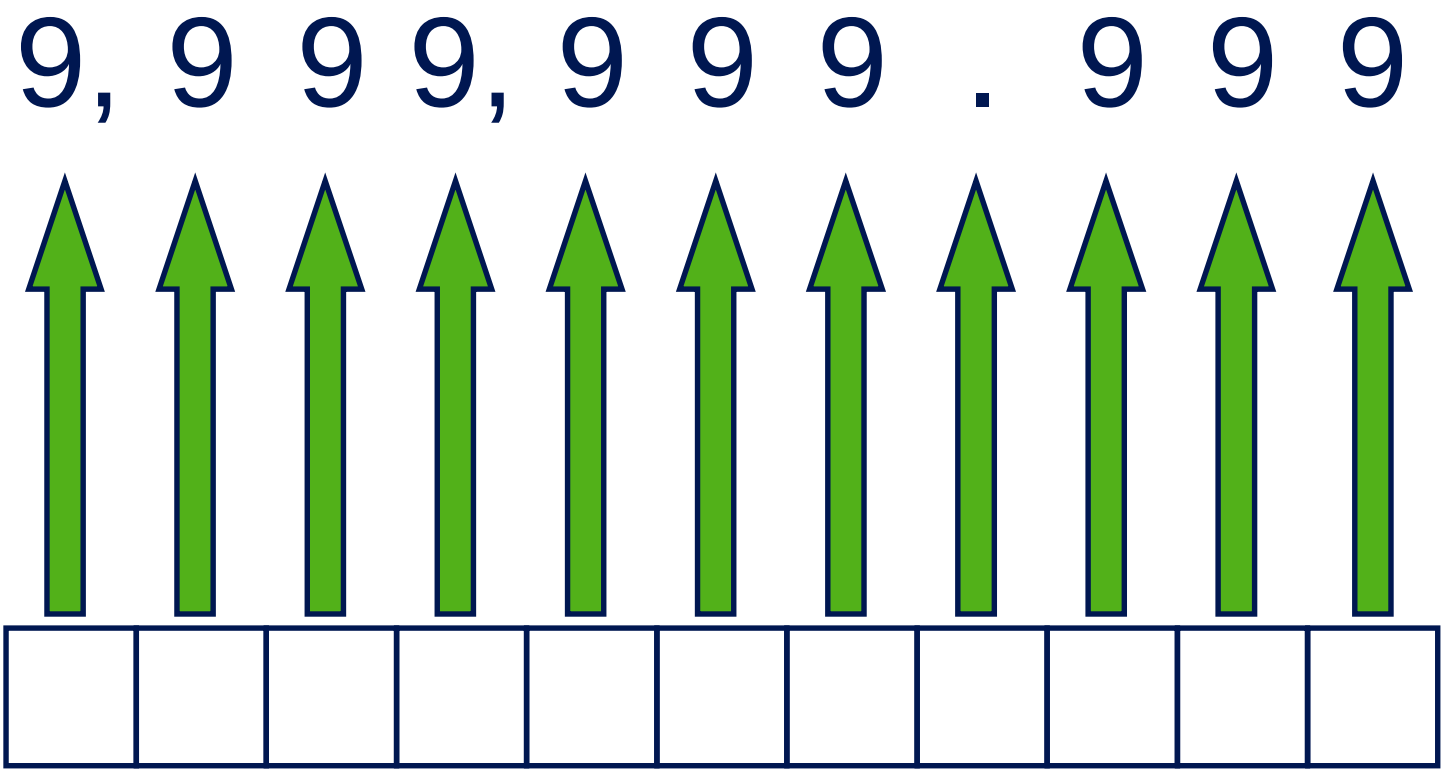
9) 461,735 _____

10) 999,999 _____

SECTION B

Explain the value represented by a specific digit in a given number (up to one million)

Identify the place value of these 9s and write in the correct letter:



A Millions

B Tenths

C Thousands

D Tens

E Hundreds of thousands

F Units

G Hundredths

H Decimal Point

I Tens of thousands

J Hundreds

K Thousandths

Write the above number in letters:

_____

SECTION C

Place numbers up to one million in ascending and/or descending order

The following is a table of amusement parks and the number of visitors they get per month. Put the numbers in order from **smallest** to **largest**.

Disneyland California	945,124
Thorpe Park	12,368
Alton Towers	200,147
Pleasurewood Hills	300
Disney World Florida	647,359
Merry Go Round on Cathedral Square	109

Lowest					Highest

The following is a table of amusement parks and the number of visitors they get per year. Put the numbers in order from **largest** to **smallest**.

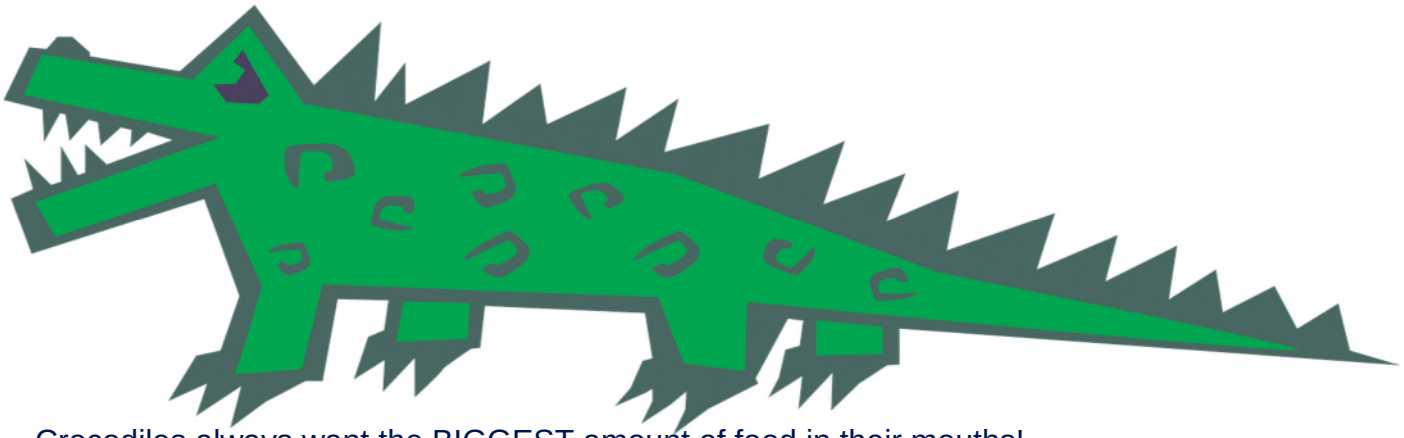
Chessington World	163,487
Universal Studios	824,364
Bretton Water Park	239
Legoland	86,147
Wicksteed Park	47,249
Astérix Park	24,796

Highest					Lowest

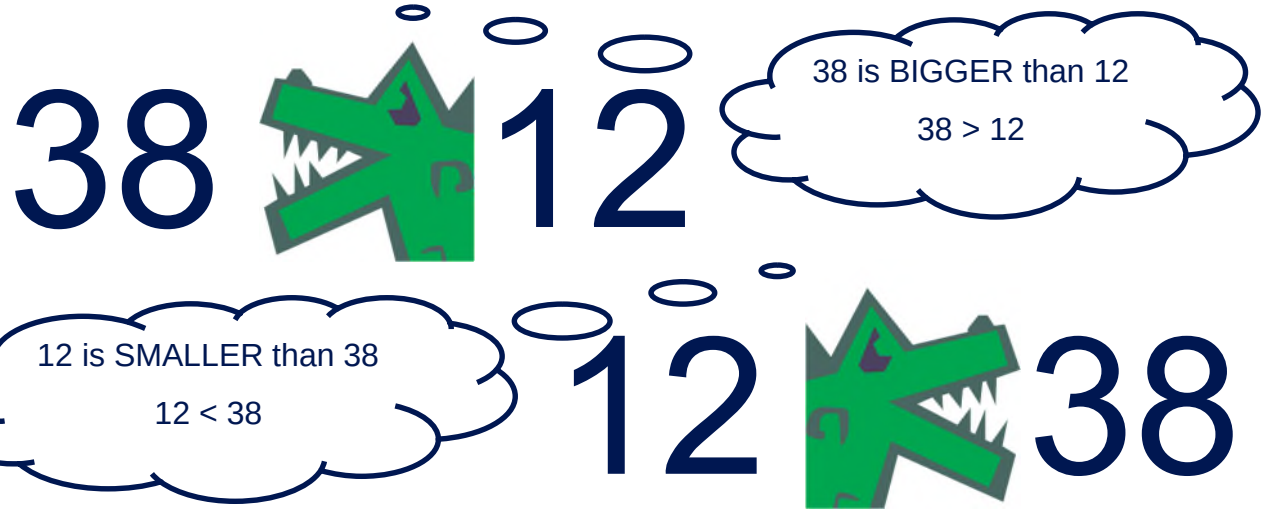
SECTION D

Compare numbers up to one million using ‘greater than’ and ‘less than’ symbols

We have crocodiles at our amusement park! Crocodiles are HUNGRY!!!!!



Crocodiles always want the BIGGEST amount of food in their mouths!



Put the crocodile symbols the right way round (remember how hungry they are!!)

12	_____	38	15	_____	68	125	_____	256
968	_____	967	967	_____	968	10,235	_____	9,347
368,457	_____	269,478	999,999	_____	111,111			

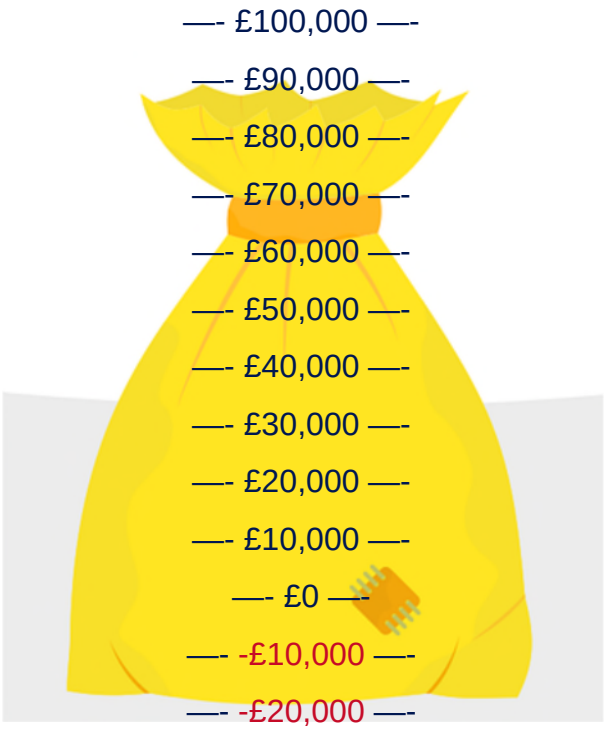
SECTION E

Recognise and use positive and negative numbers in practical contexts (e.g. temperature, profit/ loss)

Norilsk is the coldest theme park in the world. It is in Russia. The average temperature is -5°C

Miltad del Mundo in Equador is the hottest theme park in the world. The average temperature is 25°C

Alton Towers makes the most money per week of any theme park in the UK. It makes £80,000.



The Merry Go Round on Cathedral square loses money each year. Every year it loses £15,000.

SECTION F

Count in steps of various sizes, including negative numbers

You want to count the number of people in a queue quickly:

Count up in 5s:

5 ___ ___ ___ ___ ___ ___ ___ ___ ___

Count up in 15s:

15 ___ ___ ___ ___ ___ ___ ___ ___ ___

Count up in 35s:

35 ___ ___ ___ ___ ___ ___ ___ ___ ___

Count up in 90s:

90 ___ ___ ___ ___ ___ ___ ___ ___ ___

The temperature is dropping!

Count down in 5s

___ ___ ___ ___ ___ ___ ___ ___ 25°C

Count down in 3s

___ ___ ___ ___ ___ ___ ___ ___ 9°C

SECTION G

Calculate with positive and negative numbers.

1. Listed below are the temperatures of some places one day in January, in degrees Celsius.

Augsburg -6°	Berlin 3°	Chita -20°	Dresden 0°	Edinburgh -2°	Paris 6°
Florence 10°	Glasgow -3°	Halifax 5°	Istanbul 4°	Jaslo -9°	Quin 2°
Krefeld -1°	London 8°	Moscow -15°	Nancy -4°	Ryazan -14°	Oslo -7°

(a) Which place is the warmest? (b) Which place is the coldest?

Calculate the temperature difference between:

(i) Augsburg and Berlin (ii) Edinburgh and Florence (iii) Moscow and Oslo

(iv) Jaslo and Krefeld (v) Quin and Ryazan.

2. When a freezer is defrosted the temperature rises from -12 °C to 10 °C.

By how many degrees did the temperature rise?

3. Write down the temperature difference in degrees between:

(a) -3 °C and 2 °C (b) -5 °C and 7 °C (c) -7 °C and 8 °C (d) -11 °C and 2 °C

(e) -4 °C and 4 °C (f) -10 °C and 8 °C (g) -2 °C and 25 °C (h) -8 °C and 13 °C

(i) -9 °C and -2 °C (j) -11 °C and -1 °C (k) -27 °C and -5 °C (l) -18 °C and -4 °C

4. Calculate the following:

1. (a) -4 + 7	(b) -9 + 4	(c) -7 + 6	(d) -6 + 9	(e) 5 + (-3)	(f) 4 + (-8)
(g) 7 + (-1)	(h) 6 + (-5)	(i) -4 + (-1)	(j) -3 + (-6)	(k) -8 + (-7)	(l) -1 + (-1)
2. (a) -12 + 16	(b) -15 + 9	(c) -8 + 13	(d) -7 + 18	(e) 7 + (-19)	(f) 10 + (-2)
(g) 9 + (-11)	(h) 12 + (-19)	(i) -6 + (-15)	(j) -19 + (-3)	(k) -17 + (-2)	(l) -19 + (-10)

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

Using your phone, or a computer, try to find out how many people go to different theme parks. Make a note of what you find out below.

Which is the most popular?

Which is the least popular?

Rank the amusements parks in **ascending** order:

Rank the amusement parks in **descending** order:

Week 2

Learning Outcomes:

L1.3 Multiply and divide whole numbers and decimals by 10, 100, 1000

L1.4 Use multiplication facts and make connections with division facts

L1.5 Use simple formulae expressed in words for one or two-step operations

	Criterion	How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	recognise multiples of 10, 100, 1000	/10	/10
B	recognise multiples of 2 to 9 up to 100	/10	/10
C	break down numbers into prime factors	/10	/10
D	work out multiplication and division problems using mental and written methods.	/10	/10
E	substitute a variable in a formula with a correct value	/10	/10
F	evaluate expressions in a given formula	/10	/10
G	follow the correct order of operations to evaluate a formula.	/10	/10

What do I need to work on?:

SECTION A

Recognise multiples of 10, 100, 1000

Alton Towers had the following numbers of visitors last week. Tick the columns that indicate the numbers are multiples of 10, 100 and 1,000 (some of them may be more than one!)

Day	Visitors	Multiple of 10?	Multiple of 100?	Multiple of 1000?
Monday	974,360			
Tuesday	121,000			
Wednesday	36,251			
Thursday	470,000			
Friday	369,470			
Saturday	364,500			
Sunday	78,900			

In your own words, write down the pattern you notice:

SECTION B

Recognise multiples of 2 to 9 up to 100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Using different colours (write the name of the colour in the box) put a dot on each square that are multiples of:

2		6	
3		7	
4		8	
5		9	

SECTION C

Break down numbers into prime factors

Write you own definition of a prime number:

Name the first ten prime numbers:

Write your own definition of a prime factor:

What are the prime factors of the following numbers?

14 = _____ X _____

23 = _____ X _____

35 = _____ X _____

50 = _____ X _____ X _____

70 = _____ X _____ X _____

99 = _____ X _____ X _____

147 = _____ X _____ X _____

153 = _____ X _____ X _____

SECTION D

Work out multiplication and division problems using mental and written methods.

1) 7 x 71 = ____

2) 186 ÷ 62 = ____

3) 6 x 59 = ____

4) 237 ÷ 79 = ____

5) 9 x 35 = ____

6) 2 x 51 = ____

7) 264 ÷ 24 = ____

8) 704 ÷ 88 = ____

9) 204 ÷ 51 = ____

10) 5 x 81 = ____

11) 42 ÷ 6 = ____

12) 12 x 42 = ____

13) 504 ÷ 72 = ____

14) 10 x 36 = ____

15) 305 ÷ 61 = ____

16) 8 x 35 = ____

17) 35 ÷ 5 = ____

18) 9 x 83 = ____

19) 4 x 39 = ____

20) 560 ÷ 56 = ____

21) 388 ÷ 97 = ____

22) 402 ÷ 67 = ____

23) 7 x 90 = ____

24) 9 x 40 = ____

25) 144 ÷ 24 = ____

26) 960 ÷ 80 = ____

27) 6 x 38 = ____

28) 6 x 71 = ____

29) 25 ÷ 5 = ____

30) 8 x 93 = ____

SECTION E

Substitute a variable in a formula with a correct value

Your amusement park needs to re-order ice creams. As the weather forecast is that it will be sunny next week, you use the following formula to predict how many ice creams you'll need:

$$n = 1.2 \left(\frac{a+b+c+d+e+f+g}{7} \right)$$

Where:

n = number of ice creams you need to order

a = ice creams sold on Monday

b = ice creams sold on Tuesday

c = ice creams sold on Wednesday

d = ice creams sold on Thursday

e = ice creams sold on Friday

f = ice creams sold on Saturday

g = ice creams sold on Sunday

	Mon	Tues	Weds	Thur	Fri	Sat	Sun
Ice creams sold	152	136	147	123	234	358	415

Re-write the formula below using the numbers, rather than letters:

$$\_\_\_\_\_ = 1.2 \left(\frac{\_\_\_\_\_+\_\_\_\_\_+\_\_\_\_\_+\_\_\_\_\_+\_\_\_\_\_+\_\_\_\_\_+\_\_\_\_\_}{7} \right)$$

SECTION E - CONTINUED

Substitute a variable in a formula with a correct value

There are some things to remember about formulas:

- Formulas don't use the times (multiply) sign ("x"). If letters are together then it means you multiply them: so n=1.2ab really means n = 1.2 x a x b

- Sometimes formulas don't use the divide sign ("÷") they will put expressions on top of each other when you are meant to divide them so:

$$n = \left(\frac{a + b}{2} \right)$$

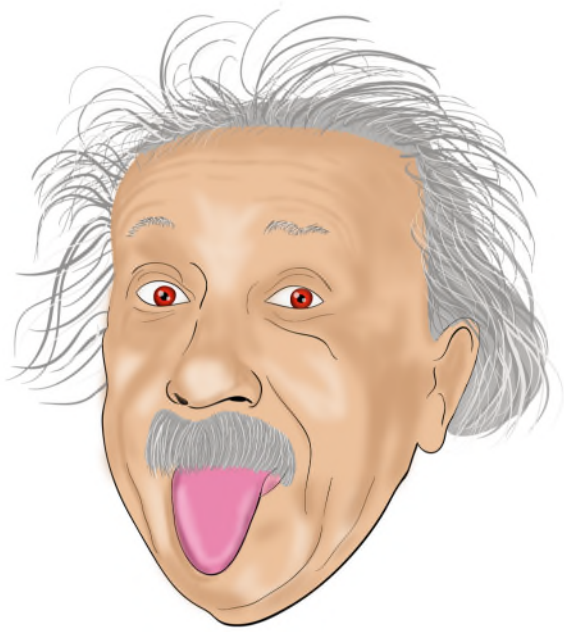
means that you have to add a and b, then divide them by two.

- Evaluate the expressions in brackets first:

$$n = c \left(\frac{a + b}{2} \right)$$

means you should do the sum a + b ÷ 2 THEN multiply by the value of c

- Don't get intimidated! You will get marks for putting the numbers into the formula, so don't forget to do it!



SECTION F

Evaluate expressions in a given formula

Don't forget that EVALUATE means "find the answer" in maths language.

Perimeter of a square = 4a

Where a = length of the sides of the square. Evaluate where a = 8cm _____

Perimeter of a rectangle = 2(l+w)

Where, l = length ; w = width. Evaluate where l = 19, w = 7 _____

Area of a square = a x a

Where a = length of the sides of the square. Evaluate where a = 25cm _____

Area of a rectangle = l × w

Where, l = length ; w = width. Evaluate where l = 19, w = 7 _____

Area of a triangle = b x h ÷ 2

Where, b = base of the triangle ; h = height of the triangle

Evaluate where b = 19, h = 7 _____

Area of a circle = π x r x r

Where, π = 3.14; r = radius of the circle Evaluate where r = 36 _____

Circumference of a circle = 2πr

Where, π = 3.14; r = radius of the circle Evaluate where r = 36 _____

SECTION G

Follow the correct order of operations to evaluate a formula.

BIDMAS / BODMAS / BEDMAS

This is an easy way to remember what order to do the calculations.

B O D M A S

rackets rders ivision ultiplication ddition ubtraction

Powers

Indices

Exponentials

Calculation	Order of completion	Answer
$3 \times (7-3) =$	Complete the subtraction first because it is in brackets	$3 \times 4 = 12$
$2 + 3^2 =$	Complete the power first $3^2 = 3 \times 3 = 9$ then the addition	$2 + 9 = 11$
$3 \times 10 \div 2 =$	Multiplication and division have the same level of order so complete from left to right	$30 \div 2 = 15$
$6 - 2 + 5 =$	Addition and subtraction have the same level of order so complete from left to right	$4 + 5 = 9$
$30 - 2 \times 5 =$	Complete the multiplication first and then the subtraction	$30 - 10 = 20$

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

In your amusement park, the idea is to make a lot of money! You want to make a formula to find out how much each ride makes. You have the following information:

a = number of people who use the ride per month

b = cost of the ride for visitors

c = how much it costs to staff, maintain and upkeep the ride per month

Work out what the formula is for how much money an attraction makes per month:

Work out what the formula is for how much money an attraction makes per year:

Work out what the formula is for how much money an attraction makes per day (assume 364 days):

Week 3

Learning Outcomes:

L1.6 Calculate the squares of one-digit and two-digit numbers

1.7 Follow the order of precedence of operators

1.8 Read, write, order and compare common fractions and mixed numbers

	Criterion	How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	understand that squaring a number means multiplying the number by itself	/10	/10
B	recall times tables to work out the squares of up to two-digit numbers	/10	/10
C	follow the order of operations to solve calculations.	/10	/10
D	read and write common fractions and mixed numbers	/10	/10
E	find equivalent fractions (simplify fractions)	/10	/10
F	order fractions in ascending or descending order and compare them	/10	/10
G	work out the value of a fraction of a whole number, some using various units (£, kg, m, etc.).	/10	/10

What do I need to work on?:

SECTION A

Understand that squaring a number means multiplying the number by itself

Sometimes in formulas, we see small numbers that sit on the top right of numbers or letters. We looked at the names of these in our BIDMAS section. They are called indices, powers, or exponents.

Here are the rules:

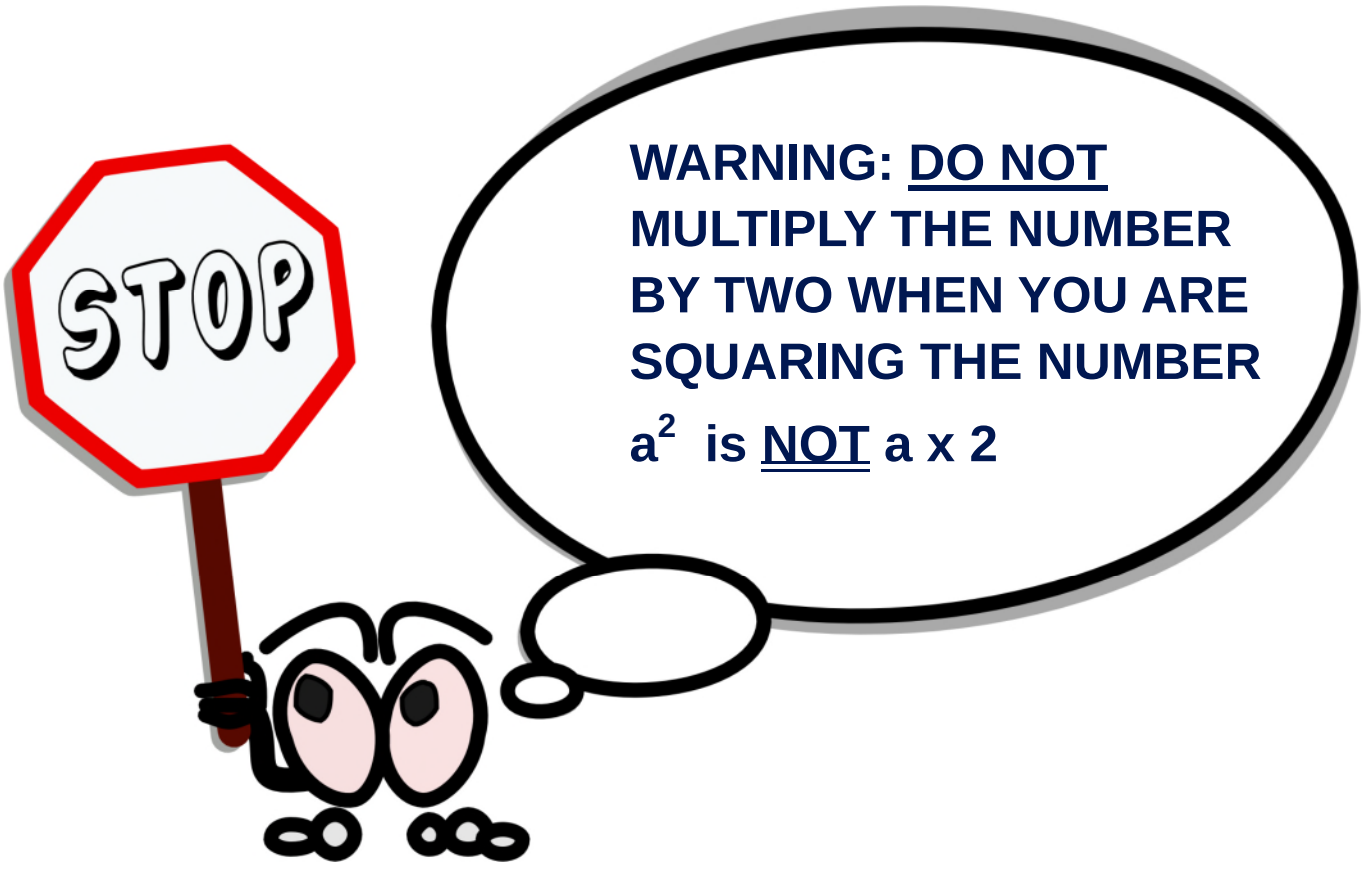
a^1 (we say "A to the power of one") is itself. $a^1 = a$

a^2 (we say "A squared" or "A to the power of two") is itself times itself. $a^2 = a \times a$

a^3 (we say "A cubed" or "A to the power of three") is itself times itself times itself. $a^3 = a \times a \times a$

We could carry on… the little number on the top right (the index, power, or exponent) gives us the number of times we have to multiply the main number by itself.

So a^6 is a multiplied by itself six times: a x a x a x a x a x a



SECTION B

Recall times tables to work out the squares of up to two-digit numbers

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Colour in the squares that represent square numbers.

SECTION C

Follow the order of operations to solve calculations.

At your Amusement park, most of the rides will take up the space of a square or a circle. Using the formula below, work out the area of the following rides:

Area of a square = a^2

Where a = length of the sides of the square.

Area of a circle = πr^2

Where, π = 3.14; r = radius of the circle

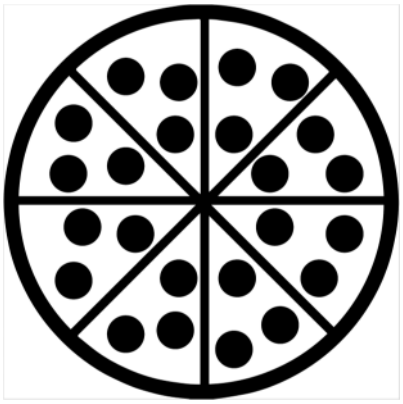
Ride	**Shape**	**Variable**	**Substitute into formula**	**Answer (remember your units)**
Pirate Ship	Square	a = 15	$Area = 15^2$	$225m^2$
Roller Coaster	Square	a = 36m		
Merry Go Round	Circle	r = 12m		
Dodgems	Square	a = 14m		
Scrambler	Circle	r = 16m		
Waltzer	Circle	r = 20		

SECTION D

Read and write common fractions and mixed numbers

You sell PIZZA at your amusement park. Everyone loves pizza! Each pizza you sell is cut into eight parts.

A family of four come to your pizza restaurant and buy one pizza for them to share.

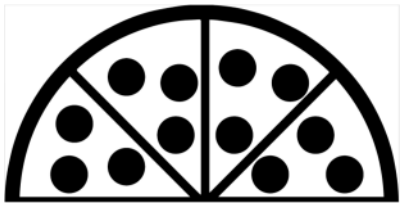


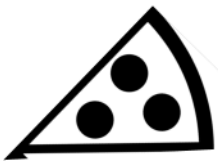
Dad eats 4 slices.

Mum eats two slices.

The little girl eats 1 slice.

The little boy eats 1 slice.





$$\frac{4}{8} \qquad \frac{2}{8} \qquad \frac{1}{8} \qquad \frac{1}{8}$$

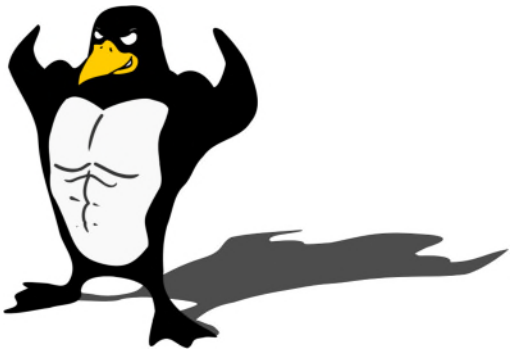
We can see that Dad ate HALF the pizza. Which we'd normally express by ½.

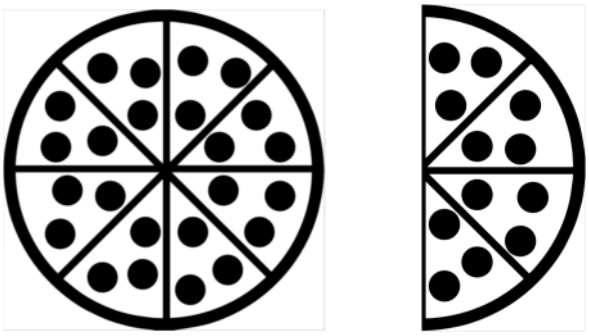
We can see that Mum ate a QUARTER of the pizza. Which we'd normally express by ¼

SECTION D - CONTINUED

Read and write common fractions and mixed numbers

One day, a power-lifting penguin comes into your pizza restaurant he's HUNGRY!!

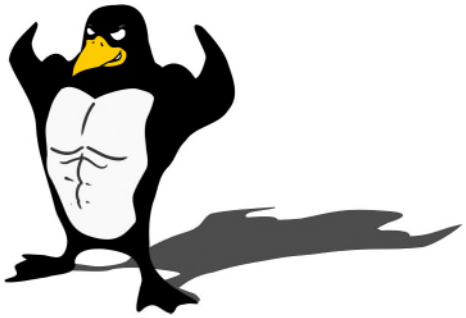


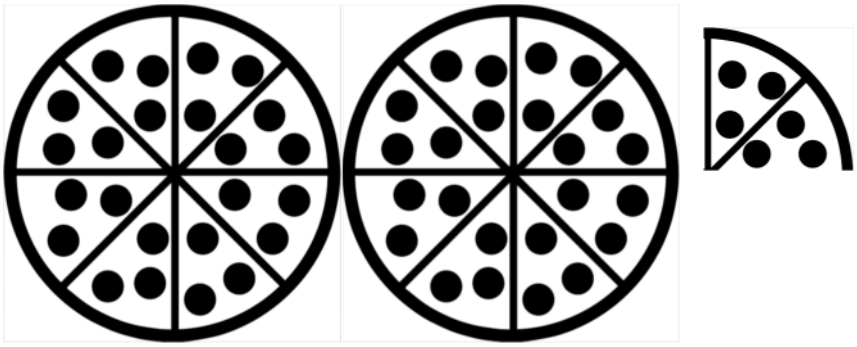


On the first day the penguin eats a one and a half pizzas!

$$1\frac{1}{2} = \frac{12}{8} = 1.5$$

The next day, the penguin eats TWO AND A QUARTER pizzas.





$$2\frac{1}{4} = \frac{18}{8} = 2.25$$

SECTION D - CONTINUED

Read and write common fractions and mixed numbers

Improper fractions are fractions where the top number is bigger than the top number. Like our power-lifting penguin eating 18/8 of pizza!

Complete the following table showing the equivalences between fractions, mixed numbers and decimals.

Mixed number	Fraction	Decimal
1 ½	$\frac{3}{2}$ ☐Proper ☑Improper	1.5
	$\frac{\quad}{2}$ ☐Proper ☐Improper	2.25
3 ¼	$\frac{\quad}{2}$ ☐Proper ☐Improper	
	$\frac{7}{4}$ ☐Proper ☐Improper	
	$\frac{\quad}{\quad}$ ☐Proper ☐Improper	4.75
6 ½	$\frac{\quad}{\quad}$ ☐Proper ☐Improper	

SECTION E

Find equivalent fractions (simplify fractions)

1) $\frac{25}{35}$ = ____

2) $\frac{8}{24}$ = ____

3) $\frac{56}{72}$ = ____

4) $\frac{9}{99}$ = ____

5) $\frac{8}{16}$ = ____

6) $\frac{2}{14}$ = ____

7) $\frac{6}{72}$ = ____

8) $\frac{12}{18}$ = ____

9) $\frac{54}{72}$ = ____

10) $\frac{16}{44}$ = ____

11) $\frac{4}{6}$ = ____

12) $\frac{21}{28}$ = ____

13) $\frac{9}{81}$ = ____

14) $\frac{10}{50}$ = ____

15) $\frac{9}{90}$ = ____

16) $\frac{6}{12}$ = ____

17) $\frac{32}{80}$ = ____

18) $\frac{14}{35}$ = ____

19) $\frac{18}{72}$ = ____

20) $\frac{5}{30}$ = ____

SECTION F

Order fractions in ascending or descending order and compare them

Order the numbers from least to greatest.

1) $\frac{2}{25}$; $\frac{16}{25}$; $\frac{11}{25}$; $\frac{10}{25}$; $\frac{20}{25}$; $\frac{8}{25}$	2) $\frac{52}{89}$; $\frac{64}{89}$; $\frac{13}{89}$; $\frac{46}{89}$
3) $\frac{118}{120}$; $\frac{76}{120}$; $\frac{9}{120}$	4) $\frac{52}{76}$; $\frac{20}{76}$; $\frac{22}{76}$

Order the numbers from greatest to least.

5) $\frac{36}{39}$; $\frac{37}{39}$; $\frac{20}{39}$; $\frac{11}{39}$; $\frac{38}{39}$	6) $\frac{6}{9}$; $\frac{4}{9}$; $\frac{1}{9}$; $\frac{7}{9}$
7) $\frac{38}{57}$; $\frac{5}{57}$; $\frac{4}{57}$	8) $\frac{3}{10}$; $\frac{6}{10}$; $\frac{1}{10}$; $\frac{5}{10}$; $\frac{4}{10}$; $\frac{9}{10}$

SECTION G

Work out the value of a fraction of a whole number, some using various units (£, kg, m, etc.).

Complete the table filling in the gaps.

Fraction		Whole number		Answer
1/2	of	24m	is	12m
1/3	of	_____kg	is	6kg
	of	16 miles	is	4 miles
1/5	of	20cm	is	_____cm
1/6	of	_____km	is	6km
	of	25g	is	5g
1/10	of	100 litres	is	_____ litres
1/11	of	_____ fl.oz	is	3 fl.oz
	of	32 acres	is	2 acres
	of	100 hectares	is	50 hectares
3/4	of	16 m^2	is	_____m^2

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

At your amusement park you'll have a number of rides and other buildings. Most of the buildings will be squares. Complete the following table with either the area of the building, or the length of the side of the building. The first one is done for you.

Building	Shape	Formula	Variable	Substitute into formula	Answer
Dodgems	Square	a^2	a = 8 metres	8^2	$64m^2$
Roundabout	Circle	πr^2	π = 3.14 r = 6 metres	3.14×6^2	$113.04m^2$
Big Top	Circle	πr^2	π = 3.14 r = 47 metres		
Bathroom	Square	a^2	a = ___ metres		$144m^2$
Staff room	Square	a^2	a = 9.5 metres		
Ghost Train	Square	a^2	a = 17.3 metres		
Waltzers	Circle	πr^2	π = 3.14 r = 6.9 metres		

Week 4

Learning Outcomes:

L1.9 Find fractions of whole number quantities or measurements

L1.10 Read, write, order and compare decimals up to three decimal places

	Criterion	How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	Read and write a fraction using numerals and words.	/10	/10
B	read and write decimals up to three decimal places (both written in words and using digits)	/10	/10
C	explain the value represented by a specific digit in a given decimal (up to three decimal places)	/10	/10
D	place decimals in ascending and/or descending order	/10	/10
E	compare decimals up to three decimal places using ‘greater than’ and ‘less than’ symbols	/10	/10
F	add, subtract, multiply and divide decimals up to two decimal places	/10	/10
G	approximate by rounding to a whole number or to one or two decimal place	/10	/10

What do I need to work on?:

SECTION A

Read and write a fraction using numerals and words.

Complete the table:

Fraction	**Words**
$\frac{1}{2}$	Half
$\frac{3}{5}$	
	Seven eighths
$\frac{9}{10}$	
$\frac{6}{15}$	
	Fourteen nineteenths
	Seventy-two eighty-eighths
$\frac{67}{98}$	
$\frac{56}{77}$	
$\frac{102}{200}$	

SECTION B

Read and write decimals up to three decimal places (both written in words and using digits)

Write the following in digits:

1) Sixty-eight thousand, two hundred and fifty-eight point three seven _____

2) One thousand, six hundred and ninety-one point four eight six _____

3) One hundred and sixteen point eight _____

4) Seventy-two thousand, five hundred and forty-six point nine _____

5) Four hundred and thirty-nine thousand, three hundred and twenty-one _____

6) One hundred and fifty-two point three nine seven _____

7) Eight hundred and twenty-nine point three four seven _____

8) Eight thousand, eight hundred and fifty-five point three four nine _____

9) One hundred and nineteen thousand, eight hundred and fifty-one _____

10) Nine hundred and ninety-nine thousand, five hundred and sixty-three _____

Write the following in words

1) 10.368 _____

2) 99,854.1 _____

3) 659.369 _____

4) 654,397.8 _____

5) 12,697.24 _____

6) 99.47 _____

7) 3,647.147 _____

8) 54,314.7 _____

9) 461,735.6 _____

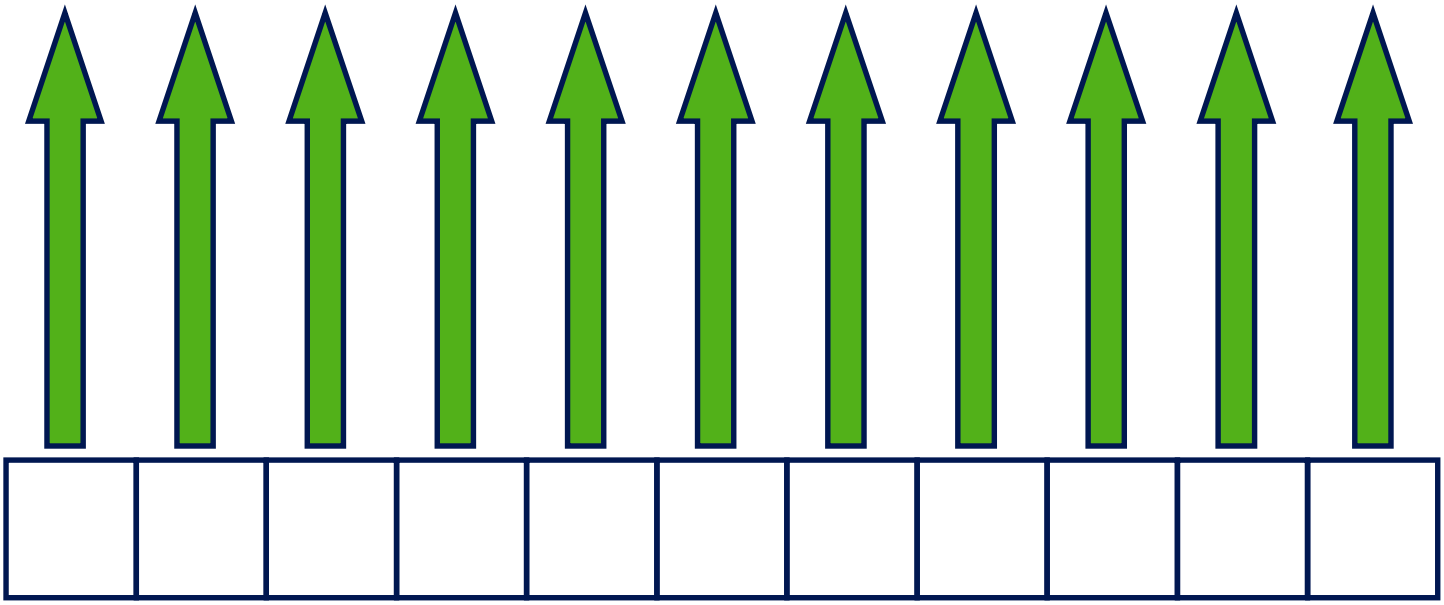
10) 999,999.9 _____

SECTION C

Explain the value represented by a specific digit in a given number (up to one million)

Identify the place value of these digits and write in the correct letter:

5, 4 3 1, 6 8 7 . 3 7 2



A Millions

B Tenths

C Thousands

D Tens

E Hundreds of thousands

F Units

G Hundredths

H Decimal Point

I Tens of thousands

J Hundreds

K Thousandths

Write the above number in letters:

_____

SECTION D & E

Place decimals in ascending and/or descending order

1. Compare the following (by writing < or > after depending on which number is larger):

(a) 9.088 and 9.88

(b) 85.440 and 86.44

(c) 6.3 and 6.248

(d) 65.07 and 65.7

(e) 7.081 and 7.08

(f) 0.2 and 2.784

(g) 12.2 and 12.022

(h) 0.4 and 0.14

(i) 10.67 and 10.7

2. Rewrite the following in ascending order:

(a) 7.05, 7.048, 7.002, 7.2

(b) 2.37, 3.1, 2.7, 3.01

(c) 2.8, 2.08, 2.88, 2.008

(d) 6.1261, 6.28, 6.05, 6.2

3. Rewrite the following in descending order:

(a) 0.03, 1.03, 0.13, 1.13

(b) 25.29, 29.25, 25.9, 29.5

(c) 6.06, 0.66, 6.6, 6.0

(d) 20, 18.08, 20.02, 18.8

4. Which is the largest decimal number: 94.002, 94.123 or 94.103?

5. Which is the smallest decimal number: 10.01, 10.13 or 10.10?

SECTION F

Add, subtract, multiply and divide decimals up to two decimal places

73.22 - 42.61	97.62 +15.19	88.48 - 67.36	65.64 +69.45
36.44 +58.33	54.67 +48.16	84.72 - 70.83	16.81 +30.35
17.76 x 84.83	93.92 x 45.61	64.97 x 86.67	47.38 x 69.76
$7\overline{)8.31}$	$6\overline{)5.76}$	$4\overline{)3.36}$	

SECTION G

Approximate by rounding to a whole number or to one or two decimal place

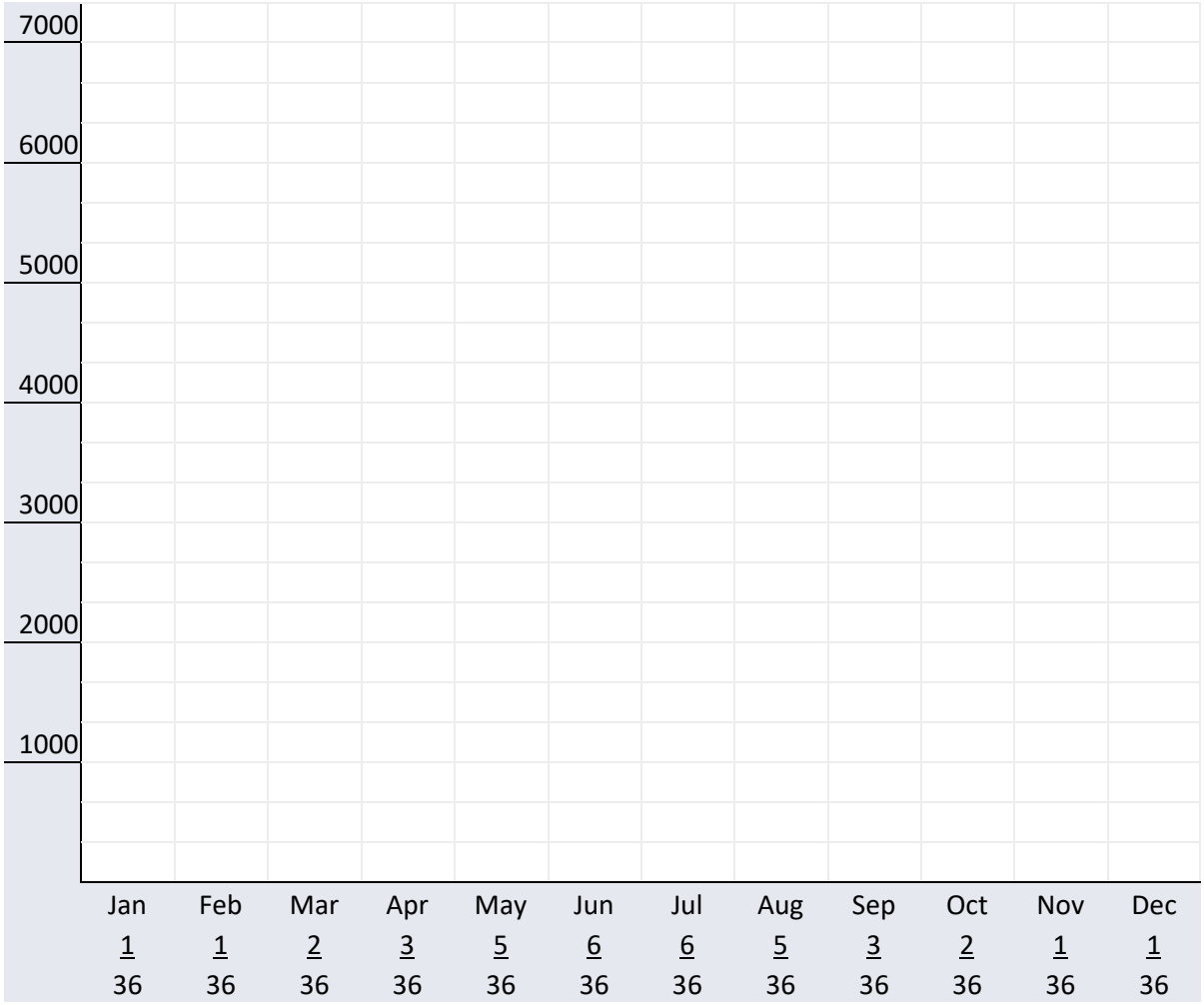
Rounding the following to a whole number, to one decimal place and two decimal place

Number	To nearest whole number	To one decimal place	To two decimal places
121.354478			
14.36478			
23.4816			
637.4971			
781.964			
48.99999			
3.14159265			
9.74954			
378.44444			
568.98774			

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

You have had 36,000 visitors over the last three years at your amusement park. Draw the bar chart of your visitors' seasonality using the fractions under each month to tell you what number to plot (so, for example, in January, you had one thirty-sixth of 36,000 visitors etc.)



Week 5

Learning Outcomes:

L1.11 Add, subtract, multiply and divide decimals up to two decimal places

L1.12 Approximate by rounding to a whole number or to one or two decimal places

L1.13 Read, write, order and compare percentages in whole numbers

	Criterion	How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	Place percentages in ascending or descending order.	/10	/10
B	Compare percentages in terms of 'greater than' or 'less than', both written in words and numerals.	/10	/10
C	Work out the percentage increase	/10	/10
D	Work out the percentage of whole numbers	/10	/10

What do I need to work on?:

SECTION A

Place percentages in ascending or descending order.

Write the following in ascending order (smallest to largest):

1) 71%, 57%, 15%, 78%, 47%, 85%, 77%, 4% _____

2) 18%, 60%, 27%, 33%, 59%, 84%, 6%, 89% _____

3) 41%, 13%, 81%, 77%, 7%, 51%, 44%, 97% _____

4) 98%, 41%, 55%, 93%, 43%, 25%, 23%, 31% _____

5) 76%, 17%, 29%, 23%, 67%, 77%, 75%, 100% _____

6) 90%, 25%, 45%, 4%, 47%, 82%, 34%, 31% _____

7) 13%, 38%, 84%, 69%, 49%, 32%, 62%, 54% _____

8) 3%, 7%, 57%, 13%, 14%, 45%, 77%, 61% _____

9) 14%, 69%, 91%, 38%, 39%, 70%, 6%, 86% _____

10) 41%, 75%, 64%, 17%, 98%, 77%, 32%, 25% _____

Write the following in descending order (largest to smallest):

1) 75%, 72%, 63%, 26%, 8%, 39%, 9%, 77% _____

2) 83%, 35%, 20%, 97%, 22%, 70%, 36%, 34% _____

3) 67%, 92%, 50%, 32%, 46%, 48%, 87%, 100% _____

4) 88%, 85%, 42%, 53%, 20%, 65%, 22%, 15% _____

5) 91%, 42%, 4%, 99%, 24%, 59%, 19%, 2% _____

6) 23%, 39%, 59%, 39%, 83%, 12%, 76%, 37% _____

7) 85%, 39%, 71%, 29%, 70%, 80%, 80%, 93% _____

8) 25%, 25%, 53%, 66%, 82%, 90%, 45%, 53% _____

9) 7%, 80%, 82%, 15%, 59%, 62%, 9%, 39% _____

10) 12%, 49%, 27%, 99%, 25%, 52%, 78%, 12% _____

SECTION B

Compare percentages in terms of ‘greater than’ or ‘less than’: written in words and numerals.

Are the following true or false:

1) 52% > 84% TRUE FALSE
2) 36% > 71% TRUE FALSE
3) 45% > 58% TRUE FALSE
4) 77% > 63% TRUE FALSE
5) 76% > 76% TRUE FALSE
6) 59% < 28% TRUE FALSE
7) 34% < 47% TRUE FALSE
8) 67% > 23% TRUE FALSE
9) 30% < 41% TRUE FALSE
10) 85% > 33% TRUE FALSE

Are the following true or false:

1) forty-nine percent > one per cent TRUE FALSE
2) twenty-two percent > sixty-six per cent TRUE FALSE
3) twenty-four percent > fifty-five per cent TRUE FALSE
4) seventy-two percent < eighty per cent TRUE FALSE
5) six percent < sixteen per cent TRUE FALSE
6) forty-nine percent < one per cent TRUE FALSE
7) ten percent < twenty-two per cent TRUE FALSE
8) ninety-eight percent < twenty-two per cent TRUE FALSE
9) sixty-two percent < nineteen per cent TRUE FALSE
10) thirteen percent > four per cent TRUE FALSE

SECTION C

Work out the percentage increase

Ticket Prices at the infamous RIP-OFFS R US are hugely expensive! Below is a table of their prices. Work out the percentage by which their prices have increased each year (each year is different!):

2010	£ 100.00	
2011	£ 108.00	_____
2012	£ 111.24	_____
2013	£ 114.58	_____
2014	£ 120.31	_____
2015	£ 131.13	_____
2016	£ 140.31	_____
2017	£ 152.94	_____
2018	£ 157.53	_____
2019	£ 160.68	_____

Hint: the formula for percentage increase is:

$$\text{Percentage Increase} = 100 \left(\frac{b - a}{a} \right)$$

Where:
a = original value
b = new value

SECTION D

Work out the percentage of whole numbers

Complete the following table. The first one is done for you. To make sure you have understood, sometimes you will be given the percentage, sometimes the first number and sometimes the answer. You need to complete the table with the missing information.

20	is	25%	of	80
15	is	_____	of	150
_____	is	20%	of	200
150	is	_____	of	100
300	is	50%	of	_____
75	is	_____	of	75
9.5	is	_____	of	19
_____	is	15%	of	150
_____	is	60%	of	240
900	is	30%	of	_____

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

You will need to increase the price of your family tickets each year. Starting with 2011, increase the cost of the tickets by the percentage given.

2010 £ 100.00

2011 1% _____

2012 1.2% _____

2013 0.8% _____

2014 0.5% _____

2015 1.1% _____

2016 3% _____

2017 0.3% _____

2018 5% _____

2019 3.1% _____

Week 6

Learning Outcomes:

L1.14 Calculate percentages of quantities, including simple percentage increases and decreases by 5% and multiples thereof

L1.14 Calculate percentages of quantities, including simple percentage increases and decreases by 5% and multiples thereof

L1.15 Estimate answers to calculations using fractions and decimals

L1.16 Recognise and calculate equivalences between common fractions, percentages and decimals

Criterion		How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	work out percentages of quantities, including increases and decreases by 5% and multiples thereof.	/10	/10
B	estimate answers to calculations using fractions and decimals	/10	/10
C	Find a common denominator between fractions to compare them.	/10	/10
D	Recognise and calculate equivalences between fractions, decimals and percentages.	/10	/10

What do I need to work on?:

SECTION A & B

Work out percentages of quantities: increases and decreases by 5% and multiples thereof.

Estimate answers to calculations using fractions and decimals

Follow the instructions

1) Write a number between 200 and 700 _____

2) Add 10% to that number _____

3) Add 15% to the number from step 2 _____

4) Take 20% off the number from step 3 _____

5) Take 25% off the number from step 4 _____

6) Add 50% to the number from step 5 _____

Estimate the following discounts:

1) 51% off a laptop that costs £300 _____

2) 24% off a fridge that costs £200 _____

3) 11% off a hob that costs £100 _____

4) 19% off a cooker that costs £800 _____

5) 26% off a TV that costs £900 _____

SECTION C

Find a common denominator between fractions to compare them.

Which is bigger?

A		B	Answer
$\frac{4}{8}$	or	$\frac{1}{4}$	
$\frac{4}{12}$	or	$\frac{2}{6}$	
$\frac{6}{9}$	or	$\frac{19}{27}$	
$\frac{12}{15}$	or	$\frac{3}{5}$	
$\frac{8}{14}$	or	$\frac{12}{28}$	

SECTION D

Recognise and calculate equivalences between fractions, decimals and percentages.

Complete the table:

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{3}{5}$		
	0.75	
		28%
	0.02	
$\frac{7}{8}$		
		99%
	0.25	
	0.125	
$\frac{6}{4}$		
$\frac{9}{8}$		

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

Which deal is best for the customer?

Deal A		Deal B	Answer
Tickets £35 each, buy four and get 15% off	or	Buy a group ticket for four people for £130	
Buy 8 tickets at £17 each and get 10% off the total	or	Buy 8 tickets for £120	
Buy 12 tickets and get a group discount of 7% when tickets are £18 for a pair	or	Get a 5% discount for buying 1-10 tickets, or a 12% discount for buying over 10 tickets. Tickets are £9, you need 12	

Week 7

Learning Outcomes:

L1.16 Recognise and calculate equivalences between common fractions, percentages and decimals

L1.18 Calculate simple interest in multiples of 5% on amounts of money

L1.17 Work with simple ratio and direct proportions

Criterion		How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	understand the multiplicative relationship between two quantities in a simple ratio	/10	/10
B	simplify ratio notation	/10	/10
C	use proportion as equality of simple ratios	/10	/10
D	relate simple ratios to fractions correctly	/10	/10
E	work with direct proportion.	/10	/10

What do I need to work on?:

SECTION A

Understand the multiplicative relationship between two quantities in a simple ratio

In your amusement park. You want to have 1 first aider, for every 10 members of staff you have. As your amusement park grows, and you get more staff, you'll need more first aiders. Here are you projections about how many staff you'll need over time. How many first aiders will you need?

Year	Staff	First Aiders
2019	10	
2020	50	
2021	100	
2022	150	
2023	200	

Your amusement park sells fizzy drinks. LOTS of fizzy drinks! The fizzy drinks are made of syrup and fizzy water in the following ratios:

Drink	Syrup : Fizzy water	Drink	Syrup : Fizzy water
Cola	1:4	Lemon	1:6
Diet cola	1:3	Cherry	1:9
Orange	1:5		

How much syrup and fizzy water will you need to make the following amounts of fizzy drink?

Drink	Amount	Syrup	Fizzy water
Cola	100 litres		
Diet cola	160 litres		
Orange	180 litres		
Lemon	140 litres		
Cherry	90 litres		

SECTION B

Simplify ratio notation

Diet cola is made from syrup and fizzy water in the ratio 1:3.

1 ml syrup	1 ml water	1 ml water	1 ml water

For every 1ml of syrup, you use 3ml of water, making 4ml in total. If you served 4ml of diet cola to a customer, that's less than a teaspoonful! Not very good on a hot day!

To make a **litre** of diet cola how much syrup and water would we use?

You can see that it's the same ratio, we're just using different quantities.

_____ ml syrup	_____ ml water	_____ ml water	_____ ml water

Simplify the following ratios:

Ratio	**Simplified**
2:4	
3:9	
4:16	
5:25	
6:36	
7:49	
8:64	

SECTION C

Use proportion as equality of simple ratios

We can relate proportions to ratios:

1	1	1	1

Colour in a quarter of the boxes above. How many boxes are coloured in? _____ How may boxes are not coloured in? _____ What does this make the ratio of coloured-in boxes to empty boxes? _____

Proportion		**Ratio =**
Colour in one quarter		_____
Colour in one third		_____
Colour in half		_____
Colour in three quarters		_____
Colour in two thirds		_____

SECTION D

Relate simple ratios to fractions correctly

Complete the following table with equivalences between fractions, decimals, percentages, ratios and proportions.

Fraction	Decimal	Percentage	Ratio	Proportion
½	0.5	50%	1:1	half
	0.25			
		75%		
			1:4	
⅓				
	0.6666666666			
⅛				

What do you notice? What did you find hard? Why?

SECTION E

Work with direct proportion.

Solve the following:

The Big Top at your amusement park uses lots of rope. The weight of a piece of rope is directly proportional to its length. A piece of rope is 25m long and has a weight of 60kg. Another piece of the same wire is 30m long. Calculate the weight of the 30m piece of wire.

The amount of money earned by Sasha, M, is directly proportional to the number of hours she works, h. After working for 9.5 hours she earns £155.80.

a) Express M in terms of h.

b) Using the equation formed in part a), or otherwise, find out how many hours it would take for her to earn £688.80.

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

In your amusement park, you have to have 1 first aider for each 50 visitors. For every 10 first aiders, you have to have 1 first aid supervisor. Write out the ratio of:

supervisors : first aiders : visitors

_____ : _____ : _____

Using the ratio above, complete the following table:

supervisors	first aiders	visitors
		50
		100
		500
		1000
		5000

Week 8

Learning Outcomes:

L1.18 Calculate simple interest in multiples of 5% on amounts of money

L1.19 Calculate discounts in multiples of 5% on amounts of money

L1.20 Convert between units of length, weight, capacity, money and time, in the same system

Criterion		How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	Work out simple interest on amounts of money	/10	/10
B	Work out discount on amounts of money	/10	/10
C	Convert between units of length, weight, capacity, money and time in the same system	/10	/10
D	Calculate accurately to two decimal places, using the correct units	/10	/10
E	Recognise and make use of simple scales on maps and drawings	/10	/10

What do I need to work on?:

SECTION A & B

Work out simple interest on amounts of money

Work out discount on amounts of money

You invested £10,000 five years ago to help pay to start your amusement park. You've received 2.5% interest each year. How much money did you have each year?

1) 2010 £10,000

2) 2011 £_____

3) 2012 £_____

4) 2013 £_____

5) 2014 £_____

6) 2015 £_____

A ticket to your amusement park costs £15. You offer the following group discounts. Work out what your visitors will pay:

1) Buy 10, get 15% discount _____

2) Buy 15, get 20% discount _____

3) Buy 20, get 25% discount _____

4) Buy 25, get 30% discount _____

5) Buy 100, get 35% discount _____

SECTION C

Convert between units of length, weight, capacity, money and time in the same system

Complete the following table:

Length	There are	_____ millimetres (mm)	in a	Centimetre (cm)
	There are	_____ centimetres (cm)	in a	Metre (m)
	There are	_____ metres (m)	in a	Kilometre (km)
	There are	_____ centimetres (cm)	in a	Kilometre (km)
Area	There are	_____ square millimetres (mm^2)	in a	square centimetre (cm^2)
	There are	_____ square centimetres (cm^2)	in a	square metre (m^2)
	There are	_____ square metres (m^2)	in a	square kilometre (km^2)
Volume	There are	_____ cubic millimetres (mm^3)	in a	cubic centimetre (cm^3)
	There are	_____ cubic centimetres (cm^3)	in a	cubic metre (m^3)
	There are	_____ cubic millimetres (mm^3)	in a	cubic metre (m^3)
	There are	_____ millilitres (ml)	in a	centilitre (cl)
	There are	_____ centilitres (cl)	in a	decilitre (dl)
	There are	_____ decilitres (dl)	in a	litre (l)
	There are	_____ millilitres (ml)	in a	litre (l)

SECTION D

Calculate accurately to two decimal places, using the correct units

Complete the following table.

Length	There are	_____ millimetres (mm)	in a	**150 centimetres (cm)**
	There are	_____ centimetres (cm)	in a	**38 metres (m)**
	There are	_____ metres (m)	in a	**2.4 kilometre (km)**
	There are	_____ centimetres (cm)	in a	**0.7 kilometres (km)**
Area	There are	_____ square millimetres (mm^2)	in a	**20 square centimetres (cm^2)**
	There are	_____ square centimetres (cm^2)	in a	**3.4 square metres (m^2)**
	There are	_____ square metres (m^2)	in a	**1.6 square kilometres (km^2)**
Volume	There are	_____ cubic millimetres (mm^3)	in a	**3 cubic centimetres (cm^3)**
	There are	_____ cubic centimetres (cm^3)	in a	**9.8 cubic metres (m^3)**
	There are	_____ cubic millimetres (mm^3)	in a	**5.3 cubic metres (m^3)**
	There are	_____ millilitres (ml)	in a	**0.9 centilitres (cl)**
	There are	_____ centilitres (cl)	in a	**22 decilitres (dl)**
	There are	_____ decilitres (dl)	in a	**4 litres (l)**
	There are	_____ millilitres (ml)	in a	**6.4 litres (l)**

SECTION E

Recognise and make use of simple scales on maps and drawings

Design your theme park!

The area you have for the park is a rectangle 400m long and 300m wide. Use the scale 1cm:20m (1:2000)

Include at least 4 of these:

Log Flume 80m x 40m

Large roller coaster 200m x 80m

Boating lake 0.1km x 0.06km

House of Horrors 40m x 40m

Merry-go-round 20m diameter

A selection of kids rides 20m x 20m each

Draw a main feature ride on your plan:

Oblivion – 12m x 12m

Corkscrew - 0.1Km x 0.035Km

Steam train - 0.25Km x 30m

Include at least one of each:

Large food outlets/restaurant 20mx40m

Food kiosks 10m x 10m

Toilet blocks 10m x 10m

Food court 10m x 50m

Paths must be 20m wide for safety!

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

A security guard patrols the outside of your amusement park. Work out:

How far she walks _____km or _____m

She walks at 0.1km in ten minutes

How long does she take to do a complete circuit of your park?

Week 9

Learning Outcomes:

L1.20 Convert between units of length, weight, capacity, money and time, in the same system

L1.21 Recognise and make use of simple scales on maps and drawings

L1.22 Calculate the area and perimeter of simple shapes including those that are made up of a combination of rectangles

Criterion		How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	convert between units of length, weight, capacity, money and time in the same system	/10	/10
B	calculate accurately to two decimal places, using the correct units	/10	/10
C	recognise and make use of simple scales on maps and drawings.	/10	/10
D	work out the perimeter of simple shapes including those that are made up of a combination of rectangles	/10	/10
E	work out the area of simple shapes including those that are made up of a combination of rectangles	/10	/10

What do I need to work on?:

SECTION A & B

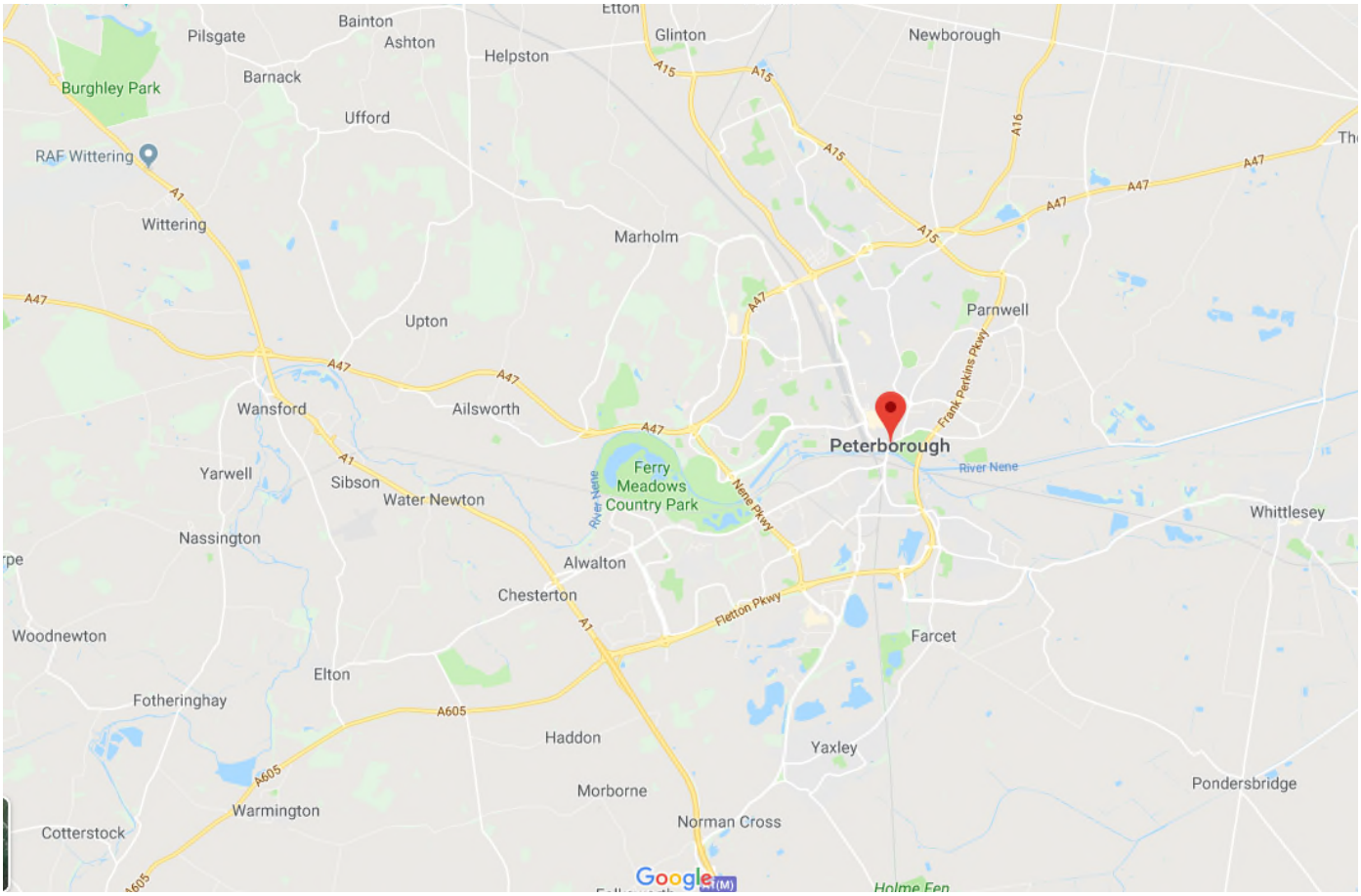
Convert between units of length, weight, capacity, money and time in the same system. calculate accurately to two decimal places, using the correct units

Complete the following table:

Money	There are	_____ pennies	in a	pound
	There are	_____ pennies	in	£3.78
	There are	_____ pennies	in	£70
	There are	_____ pennies	in	£100
Time	There are	_____ seconds	in a	minute
	There are	_____ minutes	in	an hour
	There are	_____ hours	in a	day
	There are	3,600 seconds	in	_____
	There are	168 hours	in a	_____
	There are	10,080 minutes	in a	_____
	There are	604800 seconds	In a	_____
	There are	52 weeks	in a	_____
	There are	10 years	in a	_____

SECTION C

Recognise and make use of simple scales on maps and drawings.



The map above has a scale of 1 : 40,000

As the crow files (that is, in a straight line) how far is it in KM between:

Peterborough and Chesterton: _____

Marholm and Chesterton: _____

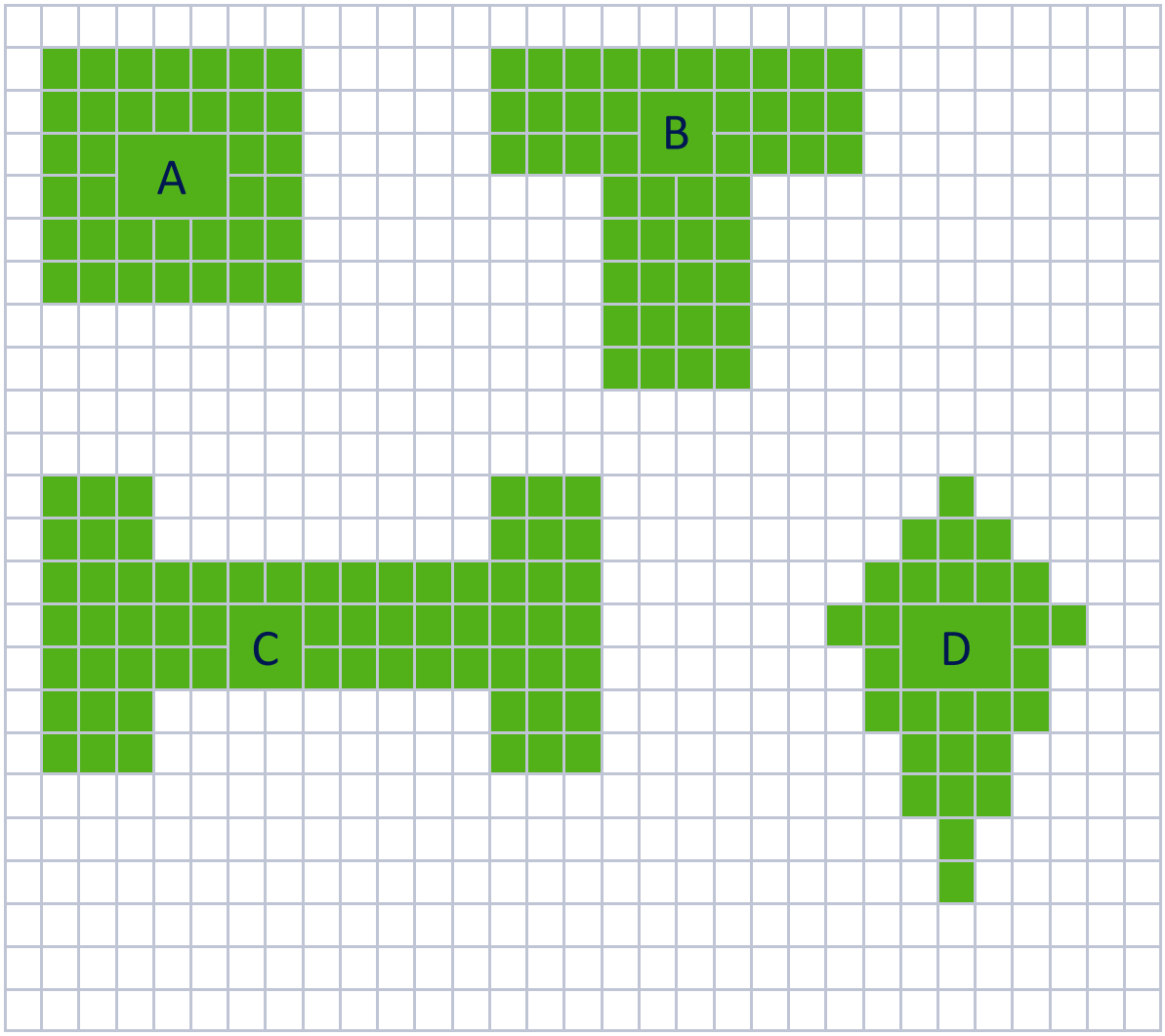
Parnwell and Newborough: _____

Pondersbridge and RAF Wittering: _____

Farcet and Ufford : _____

SECTION D & E

Work out the perimeter and area of simple shapes including those that are made up of a combination of rectangles

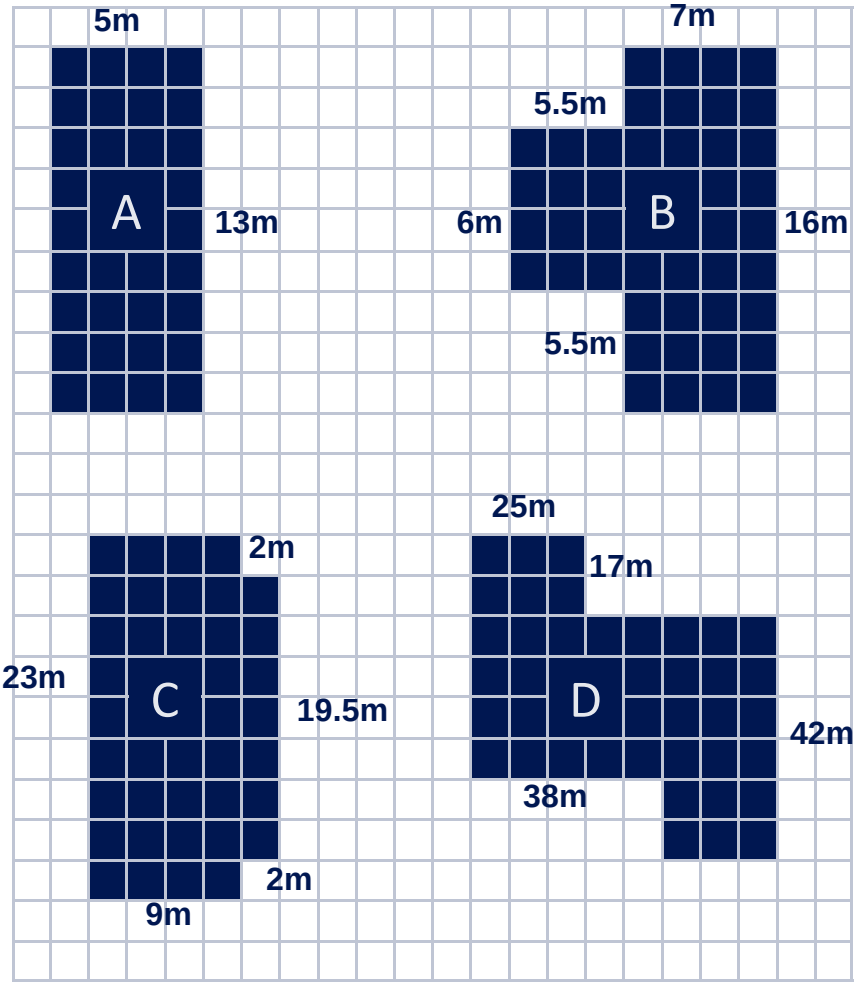


Work out the perimeters and areas of each of the above buildings at your amusement park. Each square represents 1m x 1m

	Perimeter	Area
A Candy floss stall:	_____	_____
B Staff canteen:	_____	_____
C Coconut shy:	_____	_____
D Ice cream stall:	_____	_____

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:



These drawings are <u>not to scale</u>. This time, you can't just count the squares to find the areas!

Work out the perimeters and areas of each of the buildings at your amusement park.

	Perimeter	Area
A Haunted House:	_____	_____
B Ticket Office:	_____	_____
C Burger Bar:	_____	_____
D Mini Golf:	_____	_____

Weeks 10 & 11

Learning Outcomes:

1.23 Calculate the volumes of cubes and cuboids

L1.23 Calculate the volumes of cubes and cuboids

L1.24 Draw 2-D shapes and demonstrate an understanding of line symmetry and knowledge of the relative size of angles

L1.24 Draw 2-D shapes and demonstrate an understanding of line symmetry and knowledge of the relative size of angles

L1.25 Interpret plans, elevations and nets of simple 3-D shapes

L1.26 Use angles when describing position and direction, and measure angles in degrees

Criterion		How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	work out the perimeter of simple shapes including those that are made up of a combination of rectangles	/10	/10
B	work out the area of simple shapes including those that are made up of a combination of rectangles	/10	/10
C	calculate the volumes of cubes and cuboids	/10	/10
D	draw common 2-D shapes and identify lines of symmetry	/10	/10
E	place squares of different shading into a symmetrical pattern on a grid	/10	/10
F	draw lines of symmetry on a given shape	/10	/10

Weeks 10 & 11

Learning Outcomes:

L1.22 Calculate the area and perimeter of simple shapes including those that are made up of a combination of rectangles

1.23 Calculate the volumes of cubes and cuboids

L1.23 Calculate the volumes of cubes and cuboids

L1.24 Draw 2-D shapes and demonstrate an understanding of line symmetry and knowledge of the relative size of angles

Criterion		How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
G	name common angles and their size (e.g. right angle = 90°, ¾ sector in a pie chart has 270° angle)	/10	/10
H	interpret the front elevation and plan of simple 3-D shapes	/10	/10
I	interpret a working net of a cube, cuboid, cylinder, pyramid and prism	/10	/10
J	draw nets of simple 3-D shapes	/10	/10
K	describe position or direction using angles, including bearings	/10	/10
L	measure angles in degrees.	/10	/10

What do I need to work on?:

SECTION A & B

Work out the perimeter and area of simple shapes including those that are made up of a combination of rectangles

Complete the table finding the perimeter and area of the following buildings (assume they are regular rectangles):

Building	Length	Width	Perimeter	Area
Ghost Train	15m	6m		
Staff block	21m	5m		
Dodgems	17m	18m		
Roller coaster	98m	67m		
Cafeteria	19m	23m		

Complete the table finding the missing variables of the following buildings (assume they are regular rectangles):

Building	Length	Width	Perimeter	Area
Teacups	24m	31m	_____m	$744m^2$
Mini golf	_____m	15m	150m	_____m^2
Toilet	12m	_____m	52m	_____m^2
Shower block	_____m	31m	_____m	$806m^2$
Coconut shy	19m	3m	44m	$57m^2$

SECTION C

Calculate the volumes of cubes and cuboids

You need to build some buildings for your amusement park. Work out the volumes of the buildings given the following dimensions:

Building	Length	Width	Height	Volume
Ghost Train	15m	6m	8m	
Staff block	21m	5m	6m	
Dodgems	17m	18m	12m	
Roller coaster	98m	67m	134m	
Cafeteria	19m	23m	3m	

Now complete the table below, filling in the missing information.

Building	Length	Width	Height	Volume
Laser Quest	_____m	14.8m	34m	11,825.2m^3
Haunted House	64.5m	_____m	64.5m	26,8336.1m^3
Ferris Wheel	68.3m	71.4m	_____m	498,878.2m^3
Big Top	163m	163m	201m	_____m^3
Ice cream parlour	_____m	_____m	45.3m	92,959.68m^3

SECTION D & F

Draw common 2-D shapes and identify lines of symmetry. Draw lines of symmetry on a given shape

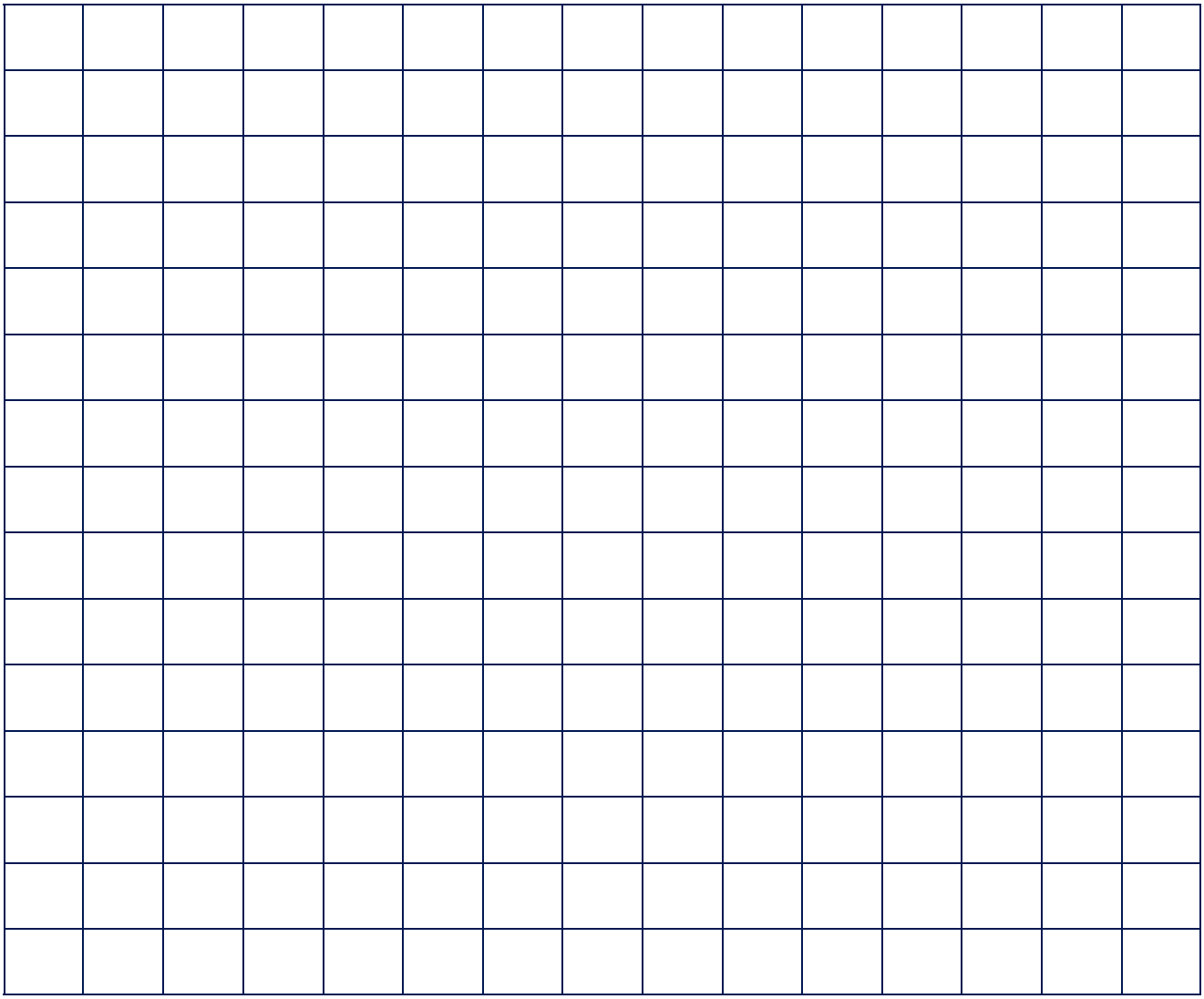
Draw a:

rectangle, square, pentagon, trapezium and circle . Draw lines of symmetry on each shape.

SECTION E

Place squares of different shading into a symmetrical pattern on a grid

The entrance hallway to your amusement park needs to have a beautiful floor. Shade in squares on the tiled floor to make a symmetrical pattern:



SECTION G & L

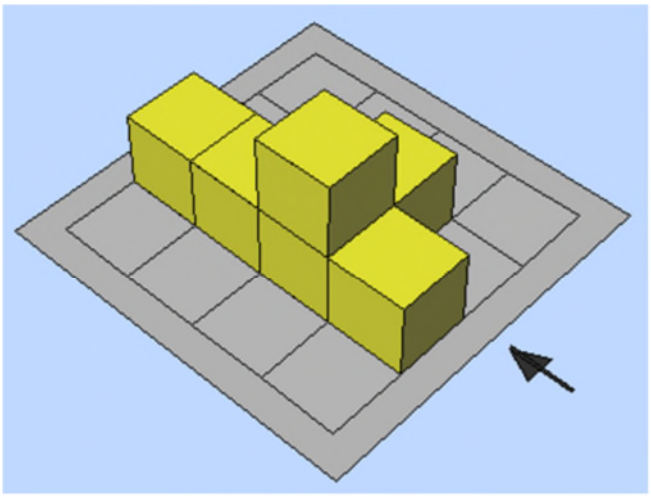
Name common angles and their size . Measure angles in degrees.

Using a protractor, measure the angles in the pie charts below. Label the fractions of the charts which are used by each segment. Label the obtuse and acute angles.

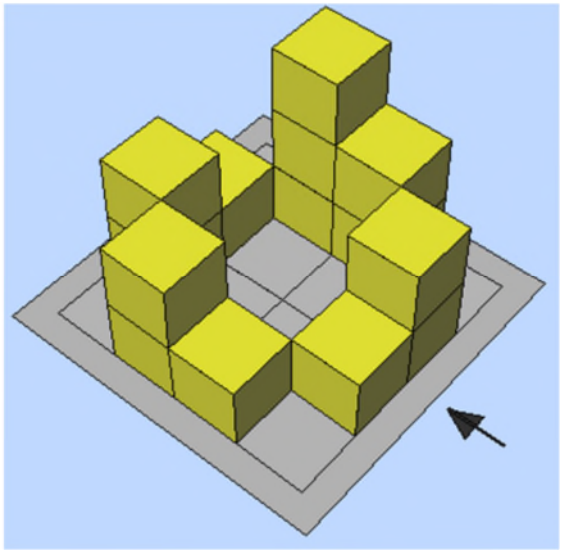
SECTION H

Interpret the front elevation and plan of simple 3-D shapes

Draw the plans and elevations for the images of attractions at your amusement park below. The front view is indicated by the arrow.



Roller Coaster

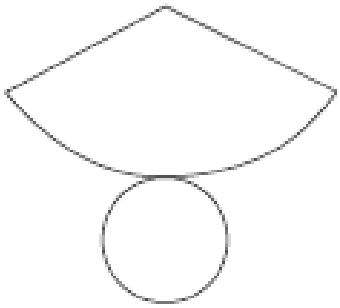


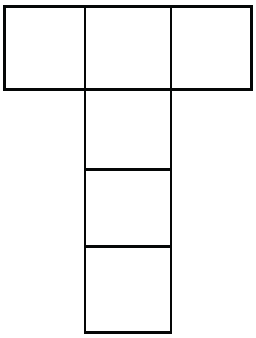
Haunted Castle

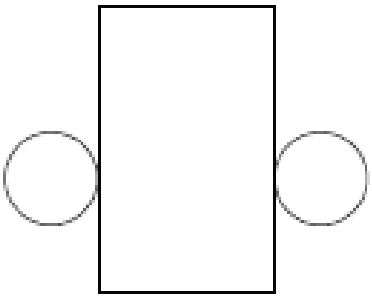
SECTION I

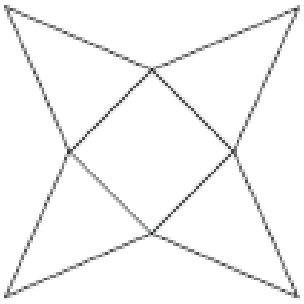
Interpret a working net of a cube, cuboid, cylinder, pyramid and prism

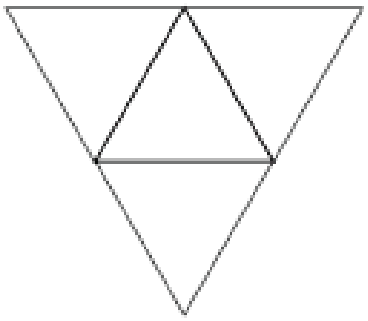
Identify the following nets:

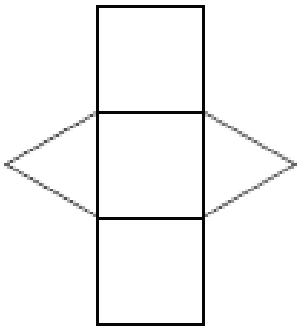












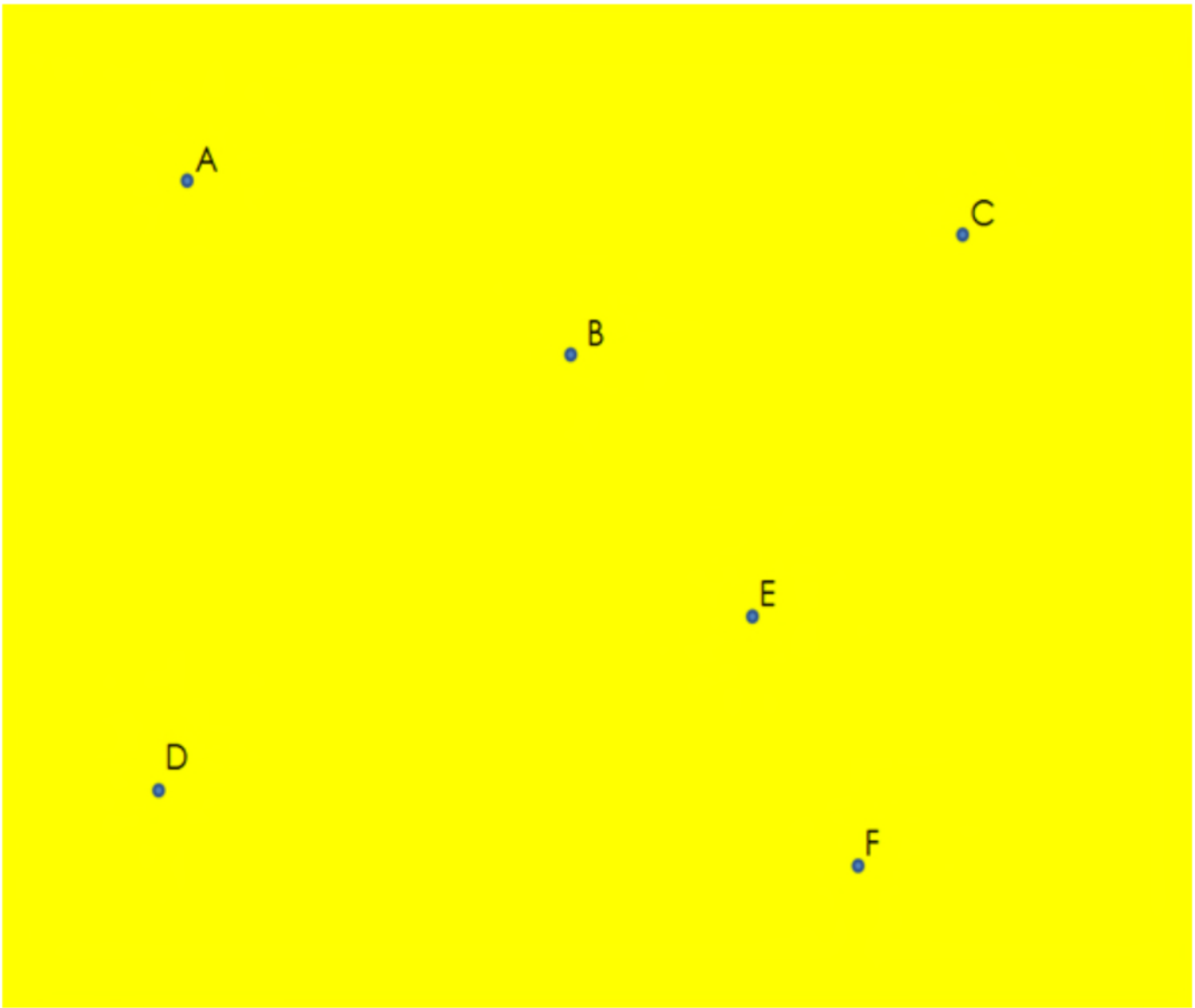
SECTION J

Draw nets of simple 3-D shapes

Draw a net of a cube, cuboid, cylinder, pyramid and prism

SECTION K

Describe position or direction using angles, including bearings



Your robot vacuum cleaner has to vacuum the floor. You need to give it bearings to tell it where to go. Using the drawing above, fill in the bearings. You'll need a protractor.

Start	End	Bearing
A	B	
B	C	
E	C	
F	D	
B	D	

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

You want to draw a shape for the top of your park's roller coaster. Starting from the dot below, use the bearings to draw the correct shape.

x

Bearing	Distance from x
000	5cm
045	1cm
090	5cm
135	1cm
180	5cm
225	1cm
270	5cm
315	1cm

Week 12

Learning Outcomes:

L1.27 Represent discrete data in tables, diagrams and charts including pie charts, bar charts and line graphs

L1.28 Group discrete data and represent grouped data graphically

Criterion		How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	extract and interpret information from tables, diagrams, charts and graphs	/10	/10
B	recognise features of charts to summarise and compare sets of data	/10	/10
C	represent discrete data in tables, diagrams and charts including pie charts, bar charts and line graphs	/10	/10
D	group discrete data and represent grouped data graphically	/10	/10

What do I need to work on?:

SECTION A & B

Extract and interpret information from tables, diagrams, charts and graphs

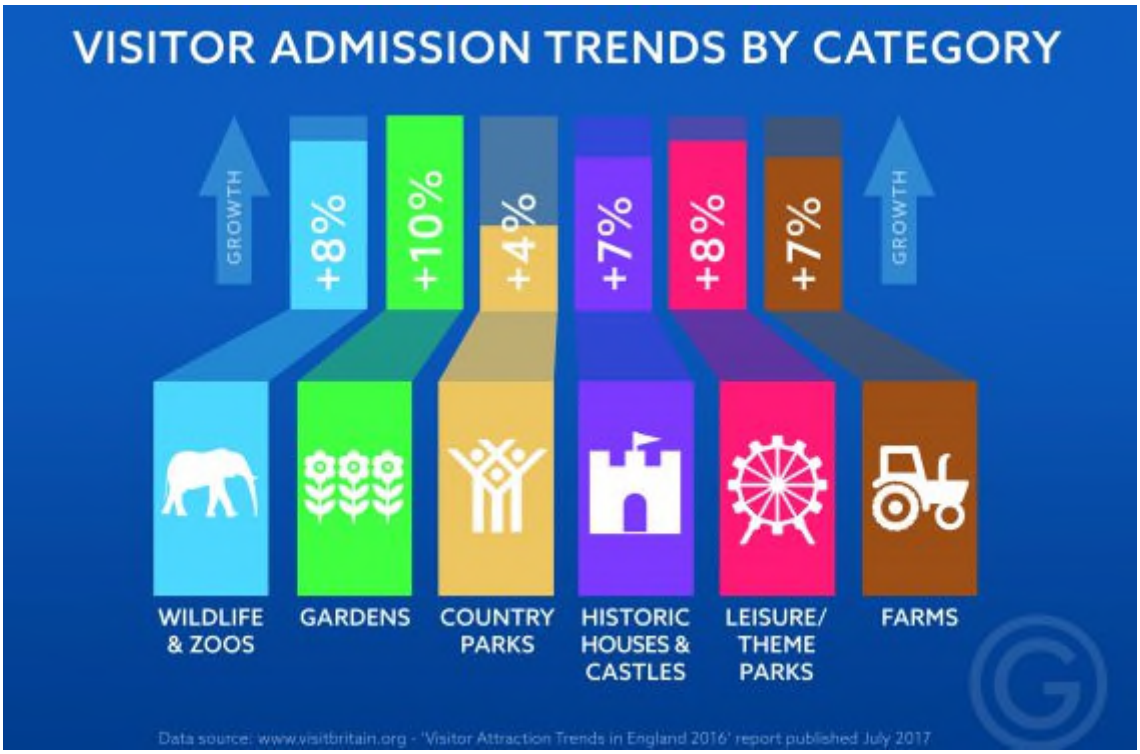
Look at the following table and write some observations based on the data:

Favourite Attraction by Age and Gender									
	Male			Female			Prefer not to say		
	<25	>25 <50	>50	<25	>25 <50	>50	<25	>25 <50	>50
Roller Coaster	21	98	28	2	67	81	37	60	81
Dodgems	67	57	4	48	52	30	12	81	31
Circus	46	30	30	13	34	52	57	71	48
Waltzers	47	94	60	29	89	35	25	93	41
Log Flume	16	99	50	16	51	40	99	48	19
Ghost Train	60	89	8	33	38	1	15	91	7
Haunted House	45	90	39	78	8	51	73	86	86

SECTION A & B CONTINUED

Extract and interpret information from tables, diagrams, charts and graphs

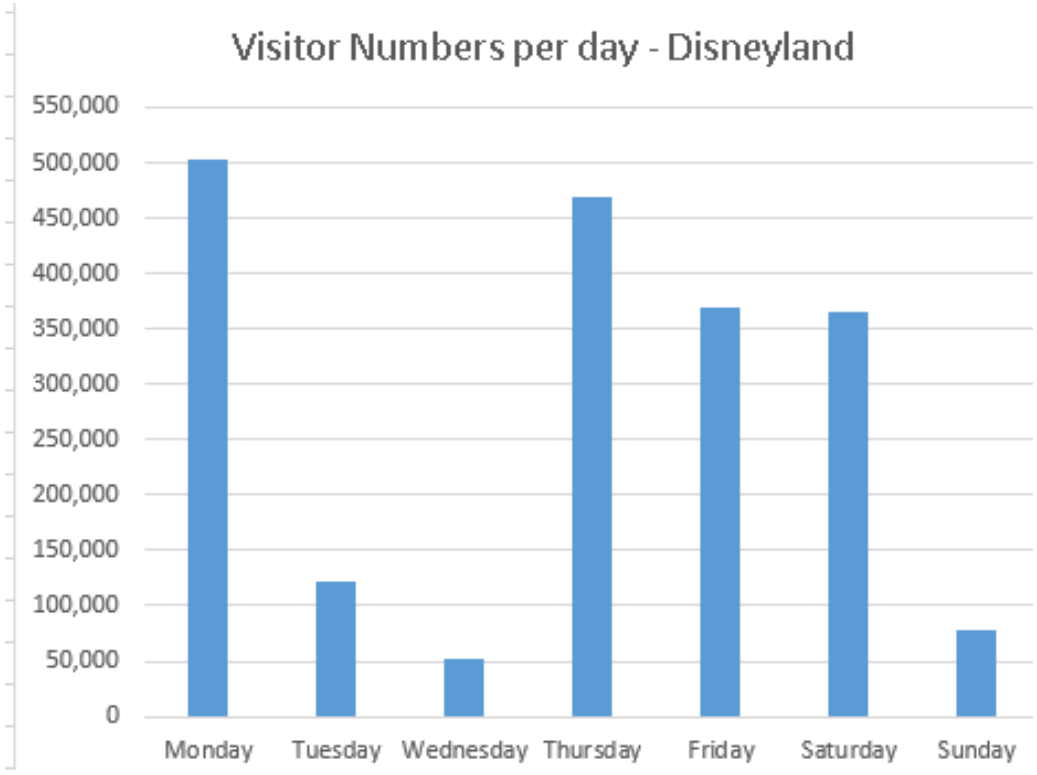
Look at the following diagram and write some observations based on the data:



SECTION A & B CONTINUED

Extract and interpret information from tables, diagrams, charts and graphs

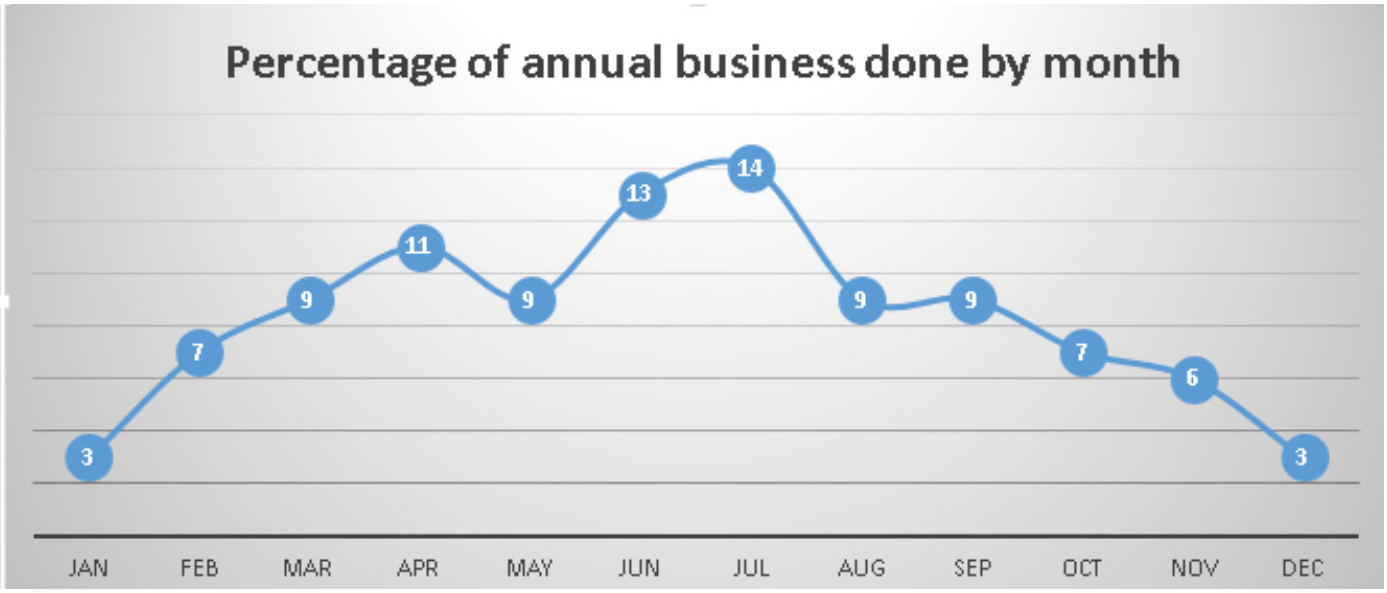
Look at the following chart and write some observations based on the data:



SECTION A & B CONTINUED

Extract and interpret information from tables, diagrams, charts and graphs

Look at the following graph and write some observations based on the data:



SECTION C & D

Represent discrete data in tables, diagrams and charts including pie charts, bar charts and line graphs

Put the following data in tables. Choose data to represent as a pie chart, bar chart and line graph.

- In 2018, 35,674 men, 33,478 women and 54,358 children visited the park
- January to December saw the following percentage of business at the park: 3%, 4%, 6%, , 11%, 8%, 12%, 14%, 16%, 14%, 5%, 4%, 3%
- From January to December your park sold these numbers of chocolate ice creams: 1500, 1600, 1300, 1700, 1300, 1400, 1500, 1900, 1300, 1200, 1000, 800
- 5% of men over 50 preferred the roller coaster. 30% of women under 50 preferred the roller coaster. 35% of men under 50 preferred the roller coaster. 10% of women over 50 preferred the roller coaster. 3% of men under 50 preferred the ghost train. 6% of women over 50 preferred the ghost train. 4% of women under 50 preferred the ghost train. 7% of men over 50 preferred the ghost train.

TAKE IT FURTHER

If you finish ahead of the others… take this time to reflect and think about the following:

Look on the internet for charts, graphs and diagrams. See what information you can find from them. Write your thoughts here:

Week 13

Learning Outcomes:

L1.29 Find the mean and range of a set of quantities

L1.30 Understand probability on a scale from 0 (impossible) to 1 (certain) and use probabilities to compare the likelihood of events

L1.31 Use equally likely outcomes to find the probabilities of simple events and express them as fractions

	Criterion	How confident do I feel /10 BEFORE the exercises?	How confident do I feel /10 AFTER the exercises?
A	analyse information presented in different ways and apply simple statistics to interpret it	/10	/10
B	work out the mean and range of a set of quantities	/10	/10
C	understand probability on a scale from 0 (impossible) to 1 (certain)	/10	/10
D	show probability as a fraction	/10	/10
E	use equally likely outcomes to find the probabilities of simple events	/10	/10
F	Time planning	/10	/10

What do I need to work on?:

SECTION A & B

Analyse information presented in different ways and apply simple statistics to interpret it. Work out the mean and range of a set of quantities

Answer the following questions:

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Max Temp	28	27	25	29	19	19	20
Min Temp	19	18	19	22	17	18	12
Chocolate	180	160	156	195	130	121	125
Vanilla	120	110	98	135	101	89	94
Strawberry	130	140	99	150	100	91	97
Total	430	410	353	480	331	301	316

What was the RANGE of temperature last week at your amusement park?

What is the AVERAGE number of ice-creams sold last week?

What is the RANGE of the amount of chocolate ice creams sold?

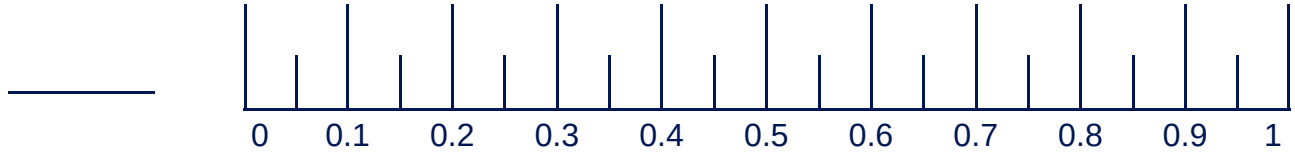
What is the AVERAGE of the strawberry ice creams sold?

SECTION C & D

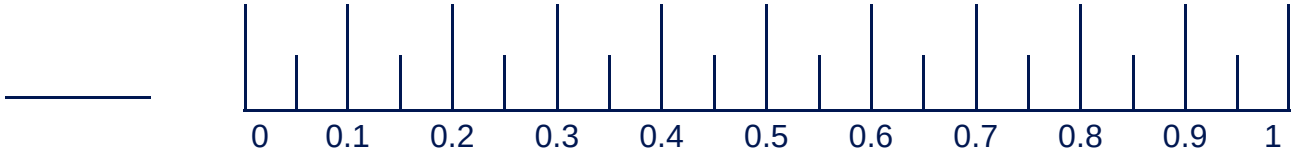
Understand probability on a scale from 0 (impossible) to 1 (certain). Show probability as a fraction

Express the following probabilities as a fraction. Then use probability scales to show the likelihood of these events:

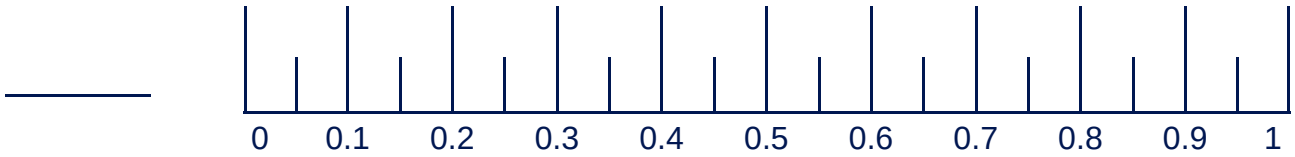
1) Rolling a 6 on a dice



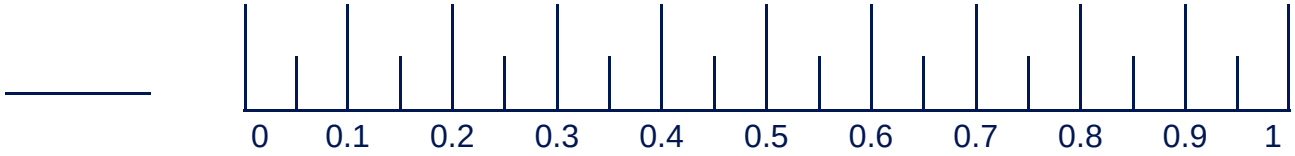
2) 30 people sit in the front row at the circus. The clowns pull eight people out to help them on stage. What your chance of being a person called onto stage?



3) There are 20 people ahead of you in the queue for the roller coaster. There are 21 seats left on the roller coaster. What is the probability that you will get a seat?



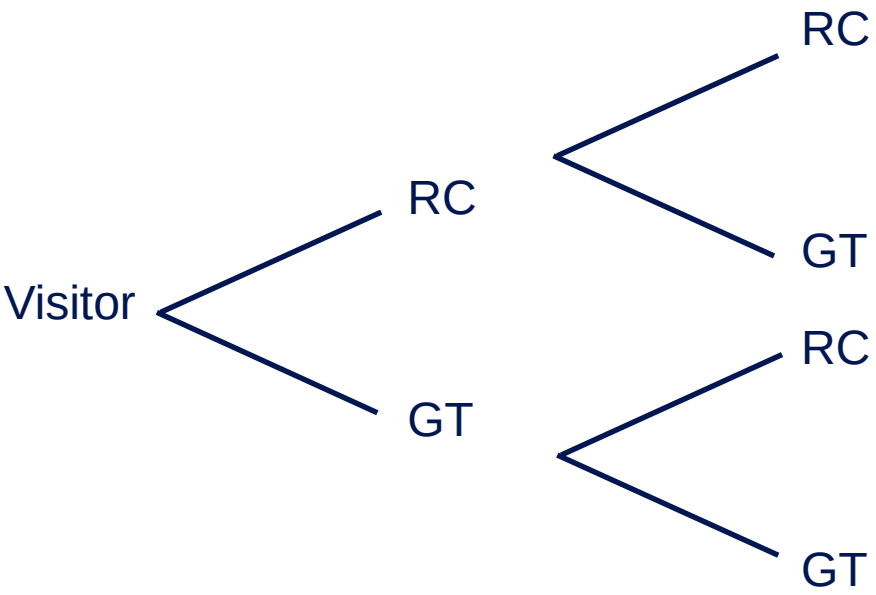
4) For every hundred people you ask, 80 of them say that clowns are scary. What's the probability that a person finds clowns scary?



SECTION E

Use equally likely outcomes to find the probabilities of simple events

Look at the following diagram:



This shows the probability tree of a person who goes on the roller coaster and the ghost train. People always choose the ghost train or the roller coaster first. Then they have an equally likely probability of going on their chosen ride again, or going on the other ride.

Write on the probabilities of each event.

SECTION E

Time planning

Someone needs to get the bus to visit your park. Answer the following question.

	Departure times			
Antrim	12:30	13:00	14:00	16:00
Randalstown	12:45	13:15	14:15	16:15
Ballymena	13:01	13:31	14:31	16:31
Ballycastle	13:39	14:09	15:09	17:09

Freddy wants to travel from Randalstown to Ballycastle.
He arrives at Randalstown at 13:03 to catch the next train to Ballycastle.

(a) How long does this train journey take?

.....minutes
(2)

Jennifer lives in Antrim and her friend lives in Ballymena.

Jennifer lives a 5 minute walk from Antrim train station.
Her friend lives a 30 minute walk from Ballymena train station.

Jennifer wants to arrive at her friend's house **before** 3pm.

Plan Jennifer's journey to her friend's house.

Notes

Notes

ACKNOWLEDGEMENTS

With thanks to the following teachers, colleagues and websites.

https://www.math-only-math.com/worksheet-on-comparing-and-ordering-decimals.html

http://www.math-aids.com/Decimals/Ordering_Decimal_Numbers.html

https://www.tes.com/teaching-resource/positive-and-negative-numbers-11826529

https://www.tes.com/teaching-resource/adding-and-subtracting-positive-and-negative-numbers-6439402

http://www.mrbartonmaths.com

https://mathsmadeeasy.co.uk/gcse-maths-revision/direct-and-inverse-proportion-gcse-revision-and-worksheets/

https://www.tes.com/teaching-resource/scale-drawing-design-your-own-theme-park-6309965

https://www.tes.com/teaching-resource/plans-and-elevations-6279742

https://www.mathworksheets4kids.com/

https://www.greenspanuk.co.uk/tag/theme-park/

https://corbettmaths.com/wp-content/uploads/2013/02/timetables-pdf.pdf