Guidance to support teachers and providers with delivery of Functional Skills Maths at Level 2.

Functional Skills maths resources contextualised to Early Years

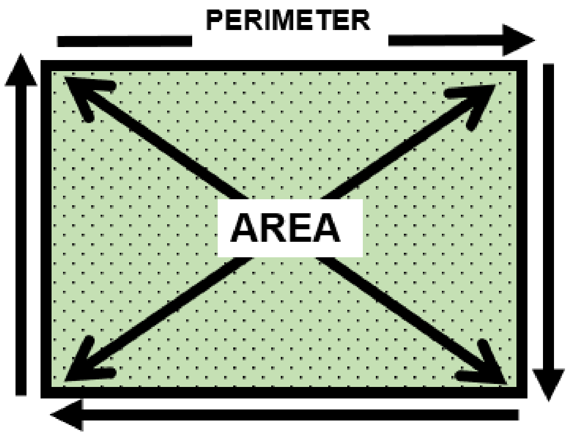
DATE: NOVEMBER 2024

Introduction

Area and Perimeter
Applications & Understanding

Area is the amount of space within a 2D shape. Think of it as how much floor space is taken up by play mats. Perimeter is the distance around the outside of the 2D shape, like walking around the edge of the play area.

Perimeter = Fence around the yard, Area = Grass in the yard.



Within Level 2 Functional skills, learners are expected to calculate area and perimeter of a variety of shapes, such as triangles, circles, and composite shapes (shapes made up of different shapes together). Learners will often be given the formula for circles and triangles.

Understanding these skills will also support learners in their career as an early year's worker. For example:

- Health and safety - ensuring enough space per child is available in play areas to meet safety regulations with square footage.
- Purchasing - understanding the area required to place new equipment before purchasing.

What Learners Should Already Know

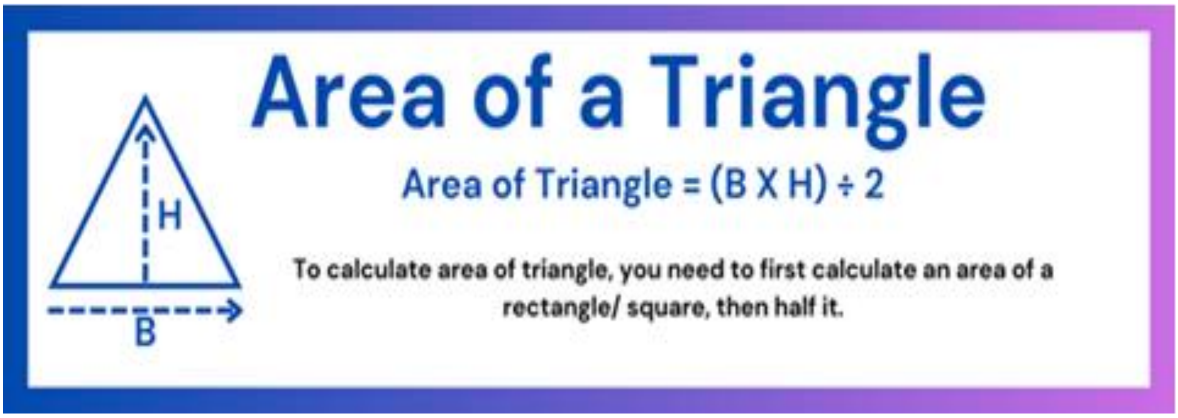
Perimeter of a square/rectangle – Learners need to understand that calculating perimeter is adding the sides.

Area of a square/rectangle – Base x Height (or BxH) - Base x Height [base is the bottom of the shape; height is the side of the shape].

N.B. If learners do not understand the basis of area and perimeter spend some time going over it as this is the basic knowledge needed.

Methods and Example Activities

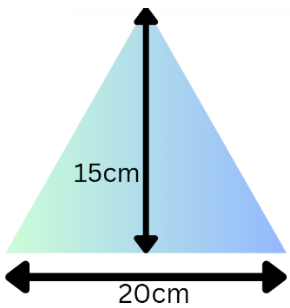
Triangle



Example Activity:

You are helping to decorate the outdoor play area at the nursery. The supervisor wants you to create triangular bunting for a party.

Each flag is a triangle with a base of 20 cm and height 15cm. You will need 40 triangles. Calculate the area of the triangle and the total area of all triangles to find out how much material is needed.



Answer:

1. First, calculate how much material will be needed for one triangle of the bunting.

$$A = \frac{BxH}{2} = \frac{20x15}{2} = 150cm^2$$

2. The next step is to use this to find out how much bunting is needed in total.

$150cm^2$ is needed for 1 bunting.

$150cm^2$ x **40** (number of triangles needed) = **$6{,}000cm^2$** of material needed.

To enhance this activity, learners could create the 40 triangles needed and then piece them together. They can use this to visualise $6{,}000cm^2$ of space but it will also help them understand the links between triangles and rectangles.

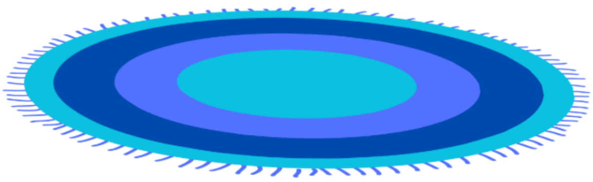
Circles

π is the relationship between the outside of a circle and the diameter of the circle. The diameter will fit into the circumference 3.14 times.
This is the same for all circle sizes, so we use it for all circle calculations.

Example Activity:
The nursery needs a new circular play mat for group activities. The mat's diameter is 3 meters.

a. Calculate the area of the mat.
b. How much of the 50m² playroom will the mat occupy?

Use 3.14 as $\boldsymbol{\pi}$



Answer:

To calculate the area of the mat, learners need to understand that the radius is needed for area, but they have been given the diameter. Radius is diameter ÷2. Knowing this, they can then apply the formula- $\boldsymbol{A = \pi r^2}$.

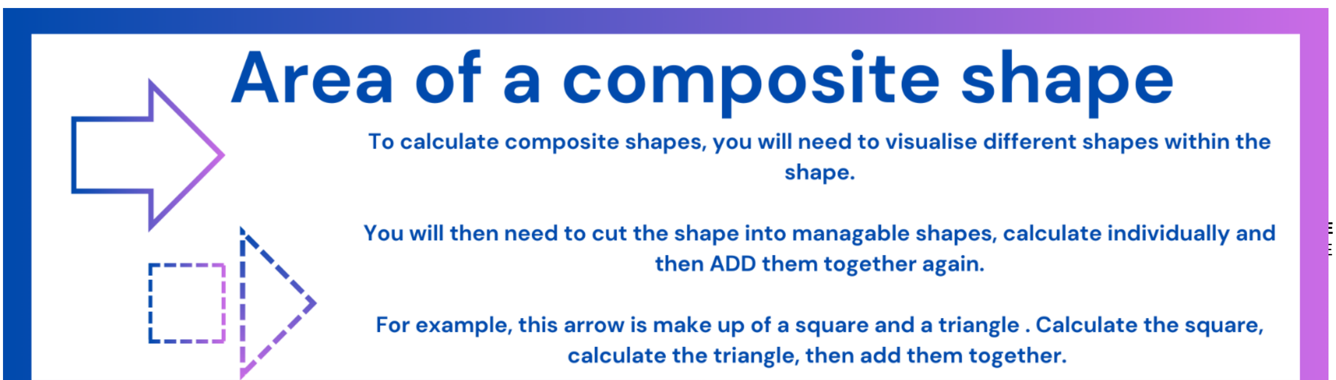
Diameter = 3m, so Radius = 1.5 m

$$\boldsymbol{A = 3.14 \; x \; 1.5^2 = 7.065m^2}$$

To calculate part b, one would need to subtract the calculated area.

$$\boldsymbol{50m^2 - 7.065m^2 = 42.935m^2}$$

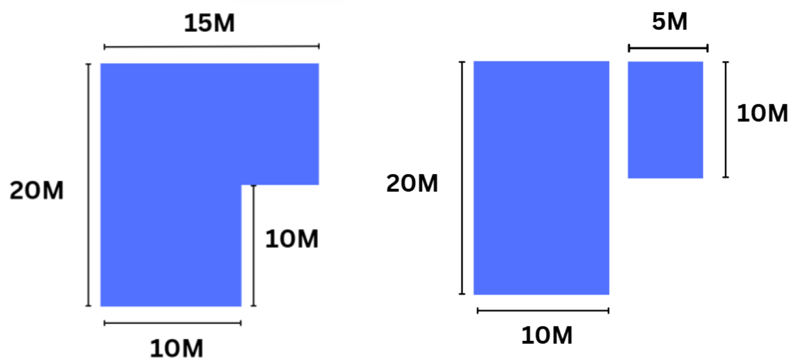
Composite Shapes



Example Activity:

The nursery is to expand its current 2-year-old room to the measurements below. Using the Early Years Foundation Stage (EYFS) framework, how many children can now fit in the 2-year-old room?

EYFS framework: 2-year-olds: 2.5 square meters per child



Answer:
The shape needs to be split into 2 easier shapes to calculate. The best way to do this is to split it into a large rectangle, and a small one. The large one will use the 20M x 10M measures.

To calculate the missing lengths, learners need to use their knowledge of rectangles being parallel and calculate what's missing. If one side is 20, the other is 10, meaning the missing measure must be 10 to add up to 20.

$$20m \; x \; 10 \; m = 200m^2$$
$$10m \; x \; 5m = 50m^2$$
$$200 + 50 = 250m^2$$

At 2.5 square meters per child, we can calculate how many can fit by dividing.

$250 \; \div 2.5 =$ **100 children can fit.**

Tips and Misconceptions

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- Learners need to understand the buttons on a calculator, especially for area calculations. It is good to practice area of a circle on a calculator multiple times so that learners know where the π button is located. Learners may not have the same calculator as in the exam, so try and use different iterations of calculators (Casio, phone calculators etc).

- Visualise the shapes – if the question doesn't give you a shape, then draw the shape.

- Don't confuse **perimeter** (distance around a shape) with **area** (space within a shape). Make sure learners are clear which is which through practice and demonstrations.

- Don't forget to square the units – all area will end in the units squared.

- Some learners confuse the height of the triangle with the side. Make sure learners understand that the height must be perpendicular to the base, not just any side length.

Building Your Own Activities

- The focus of any activity within area is the use of the formula and substitution into the formula.

- Area can be shown as triangle, circles or composite so any planned activities should include any of these.

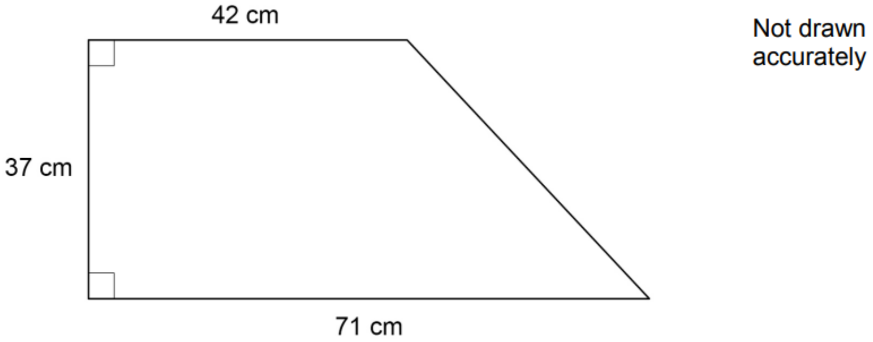
- Start off with building blocks – area of a rectangle recap before compound or triangles, as these calculations will help.

- The scenarios can be anything you wish them to be. For example, making play areas for children. Exam questions will focus on space available, or materials needed, so focus activities on these.

Exam-style Questions

Exam question taken from AQA Functional Skills Level 2 practice.

A shape is made from a rectangle and a triangle.



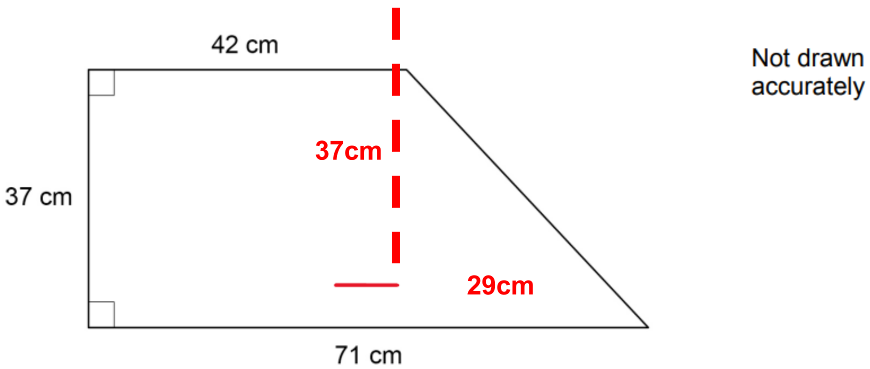
Work out the area of the shape.

[3 marks]

Work Through

This exam question is like the composite shape shown. However, instead of 2 rectangles it is a rectangle and a triangle. The shape can be split easily, as shown in the diagram below.
This then leaves a rectangle 37cm x 42cm and a triangle of 37cm x unknown measurement.
To work out the measure for the triangle, 71 – 42 = 29cm.

A shape is made from a rectangle and a triangle.



Work out the area of the shape.

[3 marks]

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Area of rectangle = 37cm x 42cm = 1,554cm^2
Area of triangle = 37cm x 29cm =1,073cm^2
Total area = 2,627 cm^2

Further Links and Extensions

The following ETF resource offers support with the skills of area and perimeter

- ETF classroom resources

The following links are unaffiliated with ETF but also provide support

- Khan Academy
- Skills workshop
- Transum maths

To extend the skills shown with area and perimeter of shapes, consider looking into surface area. Surface area works in the same way, though it looks at 2D planes on a 3D shape. These questions sometimes appear within exams. Use the website below to help.
Surface area

Volume

Applications & Understanding

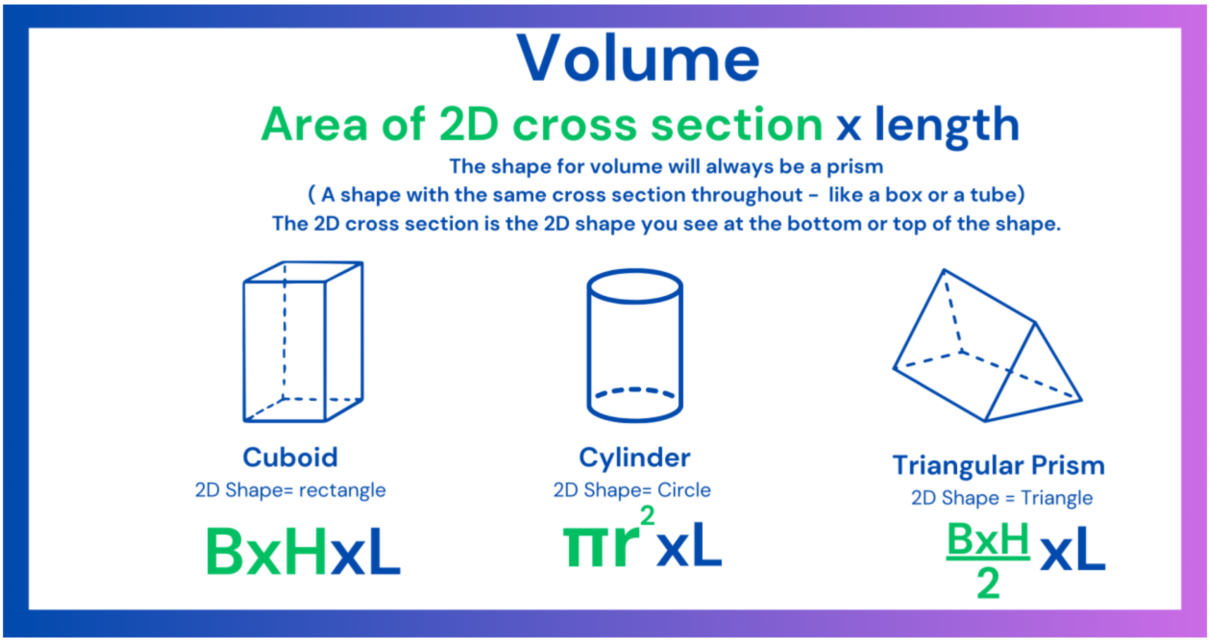
- Volume is the amount of space inside a 3D shape, like how much water fits in a bucket or how many blocks can be stored in a box. Think of it as the "space inside the container."
- Learners will calculate the volume of common shapes such as cubes, cuboids, and cylinders.
- The core skill learners will need for exams is the ability to use formula and substitute. Questions will contain the formula to calculate the volume, and it is imperative learners understand what to do.
- These skills are essential in early years settings for tasks like figuring out how many storage bins are needed for toys or how much sand is required to fill a sandbox.
- Volume will help with increasing liquids. For example, more children will mean a larger volume of juice and therefore a larger container.

What Learners Should Already Know

Learners should understand the difference between 2D and 3D shapes. By this level, learners should be able to tell the difference between volume and surface area (surface area is working out the area of each face on a shape).

Learners need to understand that shapes can be moved around to make it easier for them to calculate, and rotating does not mean it will lose volume.

Methods and Example Activities



Example Activity:

The nursery is purchasing sand for a rectangular sandpit to ensure children have enough space to play. The sandpit's dimensions have the length, height and how much sand will fill it - but it doesn't tell you the width. There is a space of 1.75M available for the width of the sandpit in the nursery garden.

You need to use the dimensions given to calculate the width of the sand pit and see if it will fit. The sandpit dimensions:

- **Length: 2 metres**
- **Height: 0.4 metres**
- **Volume: 1.6 cubic metres** ($\mathbf{M^3}$)

Answer:

The volume is calculated by using the formula for area of a cuboid shape, BxHxL. Learners should first write out the formula and replace what they know.

BxHxL = Volume

Bx0.4x2 = 1.6

Learners can identify that the base (or width) is missing. To find this, learners will complete a reverse calculation. IF B x 0.4 x 2 = 1.6, then 1.6 ÷2÷0.4 = B

1.6 ÷ 2 ÷ 0.4 = 2 metres

There is only a space of 1.75m for the width of the sandpit to go. However, this sandpit is 2m, which is too big.

Tips and Misconceptions

- Always check that all dimensions are in the same unit before calculating volume. If not, then learners may need to convert (see Converting Units).
- Be careful with the formula; make sure learners use the correct formula (this can be linked to area).
- Include appropriate units in your answer, such as $\mathbf{cm^3}$
- If part of a dimension is missing, rearrange the formula carefully to solve for the unknown.
- Learners often confuse volume with area and may only calculate 2 dimensions.

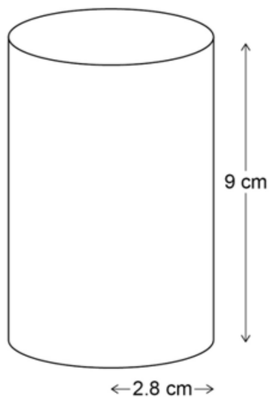
Building Your Own Activities

- The focus around volume activities is like area, being able to replace the formula for 3 dimensional shapes.
- Using real-life contexts (e.g. filling a sandbox or a water tank).
- Include at least one problem with a missing dimension. This helps them to think logically about the solution and tackle reverse calculations.
- Incorporate composite shapes requiring learners to calculate multiple volumes and combine them.
- Consider linking volume to unit conversion - convert between units of volume (e.g. litres to cubic metres).

Exam-style Questions

Exam question taken from AQA Functional Skills Level 2 practice.

A tin of carrots is a cylinder with a radius 2.5 cm and height 9 cm.



Use 3.14 as π

When filled, one sixth of the volume of the tin of carrots is water.

How many litres of water is needed for 50 tins of carrots?
1 litre = $1000 cm^3$

[5 marks]

Work Through

As a 5-mark question, learners will expect to have 5 pieces of calculations. This question looks at volume but also combines fractions and unit conversion.

Mark 1 and 2:
Find out the volume of the cylinder. Use the formula **πr^2x L.** $\boldsymbol{\pi}$ in this case is 3.14.

3.14 x 2.8^2 = 3.14 x 2.8 x 2.8 = 24.6176 cm^2
Multiply this by the length **24.6176 x 9 =221.5584 cm^3**

Mark 3:
One sixth **($\frac{1}{6}$)** of the tin is carrots, therefore five sixths **($\frac{5}{6}$)** will be the water. We will need to calculate the fraction that will be water.

TIP: To calculate fractions, divide the whole number by the bottom number then multiply by the top number.

221.5584 ÷6 = 36.9264 x 5 = 184.632cm^3 of water per tins of carrots.

Mark 4:

184.632cm^3 x 50 (for 50 tins) = 9,231.6 cm^3

Mark 5:

Convert into cm^3 litres *(See Converting unit to support)*

9,231.6 ÷ 1000 = 9.2316 litres of water needed.

Further Links and Extensions

The following ETF resource offers support with the skills of area of volume
ETF classroom resources

The following links are unaffiliated with ETF but also provide support

- Khan Academy
- Skills workshop
- Transum maths
- BBC Bitesize

To extend the skills shown with volume, consider lessons that focus on formula and substituting formula. This will help learners grasp the idea of replacing the letters for their numerical values. Use the website link below for support.
Formula

Converting Units

Applications & Understanding

- Unit conversion is the process of changing measurements from one unit to another, such as millilitres to litres or inches to centimetres.

- Within exams, unit conversion may look at length, weight, capacity (volume) or currency. The questions will often look at converting one metric to another, but sometimes shows metric to imperial.

- Questions will always come with a conversion, for example, 100cm = 1M etc. so understanding proportional reasoning will help to answer these questions.

- Learners may also need to use conversion graphs to help convert within questions.

- In an early years environment, this helps with tasks like adjusting recipes for meal preparation or ensuring equipment measurements meet safety guidelines.

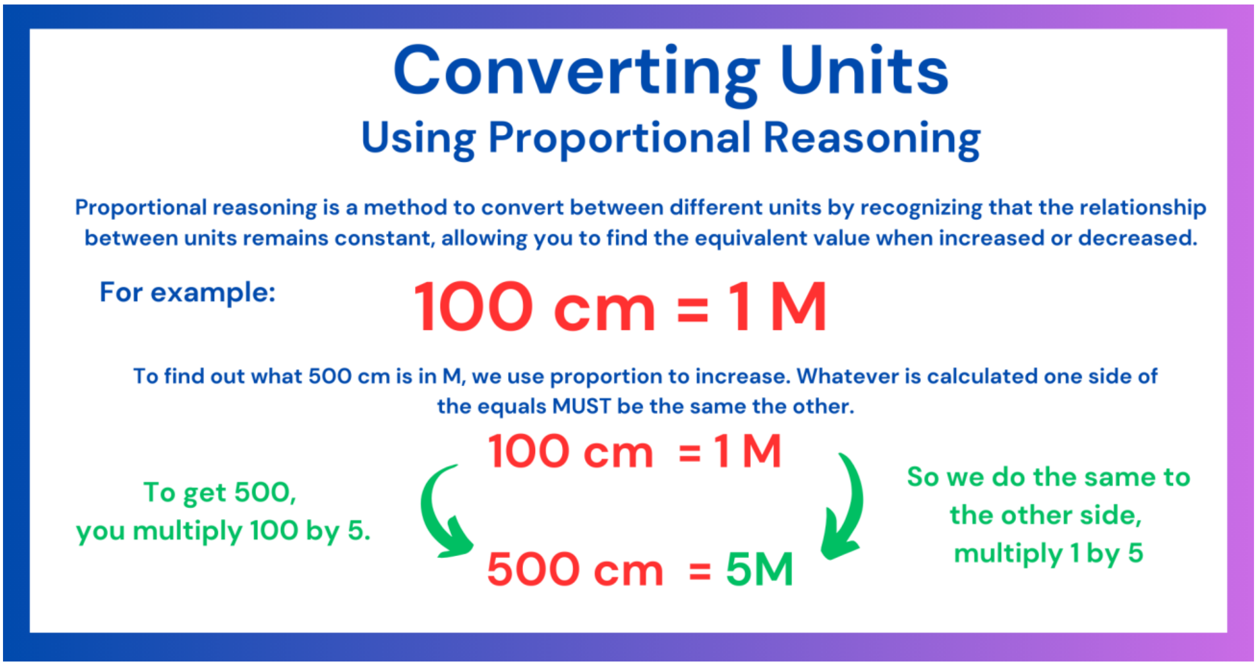
- It will also support with giving medication if needed as proportional reasoning will develop knowledge of increase/decrease.

What Learners Should Already Know

Learners should have a basic knowledge of ratio and proportion. The proportional reasoning that one thing has a relationship to another is a foundation for working with this.

Learners at this level should know the difference between length, weight, and capacity (volume) and their uses. Learners should understand basic conversions before this level, i.e. **1M = 100cm.**

Methods and Example Activities
Proportional Reasoning



Proportional reasoning is a good method to learn as it is flexible; it works for any type of unit conversion from measures to currency. It helps with clarity as it shows the relationship between units. It can be used in real world context such as scaling recipes, calculating distances, or converting currencies.

Example Activity:

You're preparing milk for snack time. Each child needs 150 millilitres (ml) of milk. There are 25 children in the group. How many litres of milk do you need in total?

Answer:

1. Calculate the total millilitres:

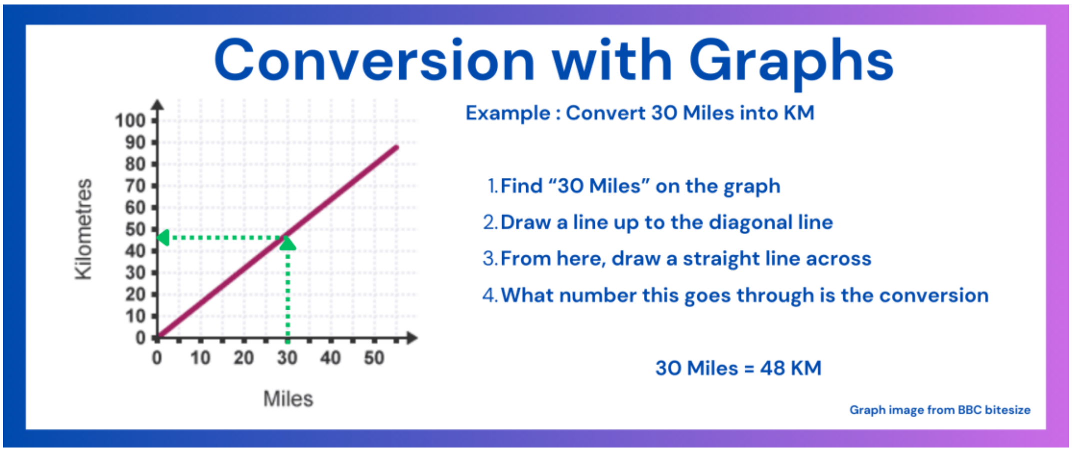
150×25=3,750 ml

2. Convert millilitres to litres using the conversion -1000ml = 1 L

To find out the missing litres, we first need to figure out the conversion factor. To do this we can divide the ml by 1000ml (as we know 1000ml = 1L)

3,750 ÷ 1000=3.75 L of milk needed.

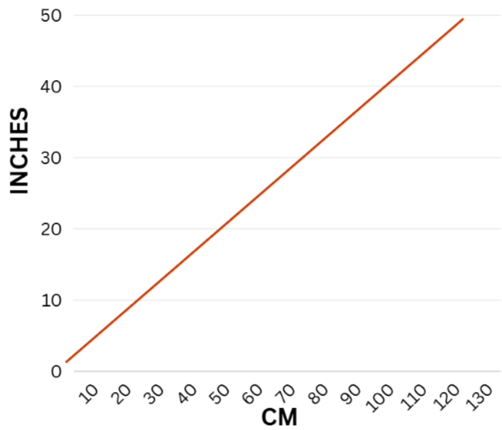
Conversion Graphs



Example Activity:

You're recording children's heights in both inches and centimetres. The graph below shows the conversion. Using the graph, convert:

1. **35 inches to centimetres.**
2. **75 centimetres to inches.**



Answer:

This question requires use of the chart.

1. 35 inches to centimetres.

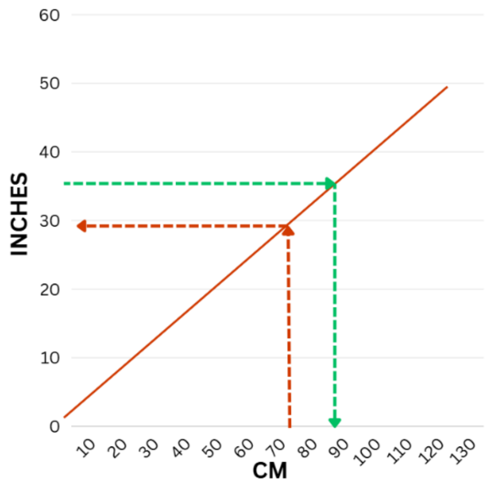
Find 35 on the "inches" axis. Draw a line to the diagonal line. Where this connects, draw a line down to the answer on cm.

35 inches ≈ **88 Cm**

2. **75 centimetres to inches**

Find 75 on the "cm" axis. Draw a line to the diagonal line. Where this connects, draw a line across to the answer on Inches.

75 cm ≈ **29 inches**



Note - *≈ has been used instead of = as it is a rough idea. Graph exam questions allow for measurement to be off +- 1.*

Tips and Misconceptions

- Having the conversion charts for common units will help learners to gain a basic understanding. Although they are given the units and conversion in the exam, having basic conversions in mind and the measures will help to give clarity.

Metric Unit Conversion

Weight (Mass)		
1KG	=	1000G
1G	=	1000MG

Length		
1KM	=	1000M
1M	=	100CM
1CM	=	10MM

Volume		
1 L	=	1000ML
1CL	=	10 ML

- Learners need to be clear what unit is required in their final calculation as they may lose marks if calculations and units are incorrect.

- Learners must be careful to avoid mixing units within a single calculation (e.g., using cm for one dimension and m for another).

- Applying the conversion factor incorrectly (e.g. in converting 500cm to m, learners may calculate it as 50000m as they have multiplied instead of divided).

Building Your Own Activities

- Use realistic scenarios, such as adjusting recipe ingredients for baking time or measuring play areas.

- Try to create activities that learners may already understand the basics of. For example, currency conversion for holidays.

- Include both metric and imperial unit conversions to practice but provide the conversion rate for example, 1 inch = 2.5 cm

- Provide opportunities to use conversion tables or graphs. You can find graphs online that convert between common units (inches to cm etc) and apply questions related to early years to this (like the activity above).

- Link converting units with area or volume; ask them to convert units of length before calculating these.

Exam-style Questions

Question taken from Pearsons Functional Skills practice past paper.

A luxury room in the hotel has a bathtub 60.3 inches long.

What is the length of the bathtub in centimetres?

Use the conversion 1 inch = 2.54 cm

Give your answer correct to 1 decimal place.

[2 marks]

Work Through

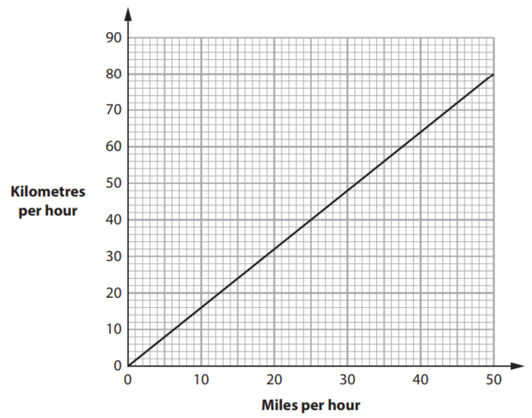
Use proportional reasoning.
1 Inch = 2.54cm
60.3 inches =?

To get from 1 inch to 60.3 inches, we multiply by 60.3. We then do the same to the other side to keep it proportional.

2.54 x 60.3 = 153.162 cm = 153.2cm to 1 decimal place.

Question taken from Pearsons Functional Skills practice past paper.

This graph can be used to convert between miles per hour and kilometres per hour.



(a) Use the graph to complete the table.

Miles per hour	Kilometres per hour
30	
	64

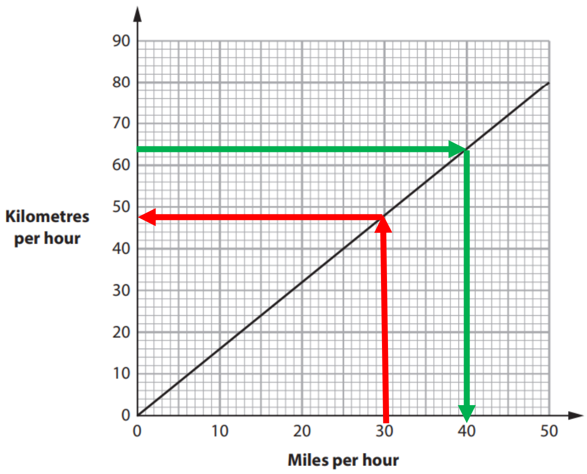
Work Through

30 Miles to KM – From 30 Miles, draw a line up to the diagonal line then across.

48 KMPH

64 KM to Miles – From 64 KM, draw a line across to the diagonal line then down.

40 MPH



Further Links and Extensions

The following ETF resource offers support with the skills of converting units
ETF classroom resources

The following links are unaffiliated with ETF but also provide support

- Khan Academy
- Skills workshop
- Transum maths
- BBC Bitesize

To extend the skills shown with unit conversion, it is best to mix with the other aspects such as area and volume and convert measures before calculating. This will allow learners to see how the exam questions can be formed.

Probability

Applications & Understanding

Probability of Events

Probability is the chance that something COULD happen.

It is shown as either a Fraction, Decimal or Percentage.

Probabilities of events always add up to 1 whole

E.G. If the probability of a bus on time is 65%, so the bus must have a 35% chance of being late (65%+35%= 100%)

E.G. If the chance of rain on a day is 0.7, the chance of no rain must be 0.3 (0.7+0.3 = 1)

E.G. The odds of getting a heads on a coin is $\frac{1}{2}$ so getting a tails is $\frac{1}{2}$ $\left(\frac{1}{2}+\frac{1}{2}=1\right)$

- For Level 2 Functional Skills, learners are expected to be able to calculate and express probabilities as fractions, decimals, or percentages.
- They are expected to be able to use tools such as two-way tables or probability trees to express probabilities and work out the probability of combined events.
- In early years settings, understanding probability helps with planning activities. For example, knowing the likelihood of something happening will help prepare for all scenarios.
- For example, knowing that there is a 70% chance of rain tomorrow will help to plan for more indoor activities.

What Learners Should Already Know

Learners should already know the probability scale (impossible, unlikely, certain) and understand probability within a number line. Learners should be aware of terminology used, such as “probability” and “chance of” meaning the same. Using tables and interpreting tables will also support them with probability to help calculate two-way tables.

Methods and Example Activities

Two-way Tables

Two-way Tables

	Boys	Girls	Total
Under 1	20	13	45
Age 1-2	10	23	33
Total	30	48	78

A way to organize and display data about different categories from a group of people (sometimes called requency tables)

Filling in missing data : Use the data that is shown to help with the missing data. The example here was missing the data in red.

20 + ? = 45
45 - 20 = 13
Girls under 1 = 13

?+23 = 33
33-23 = 10
Boys Age 1-2 = 10

Probability of picking a girl under 1 from the whole class
= How many girls are under 1 [13] as a fraction of the class total.

$\frac{13}{78}$

Probability of picking a girl under 1 from only the girls
=How many girls are under 1 [13] as a fraction of the total of Girls.

$\frac{13}{48}$

Example Activity:

You have been tasked with organising data for a report showing how far children travel to the nursery. You are given the table below.

1. **Complete the table.**
2. **Calculate the probability that a child picked at random lives over 5 miles.**

	Boys	Girls	Total
Within 1-5 miles	15		25
Over 5 miles		15	20
Total	20		45

Answer:

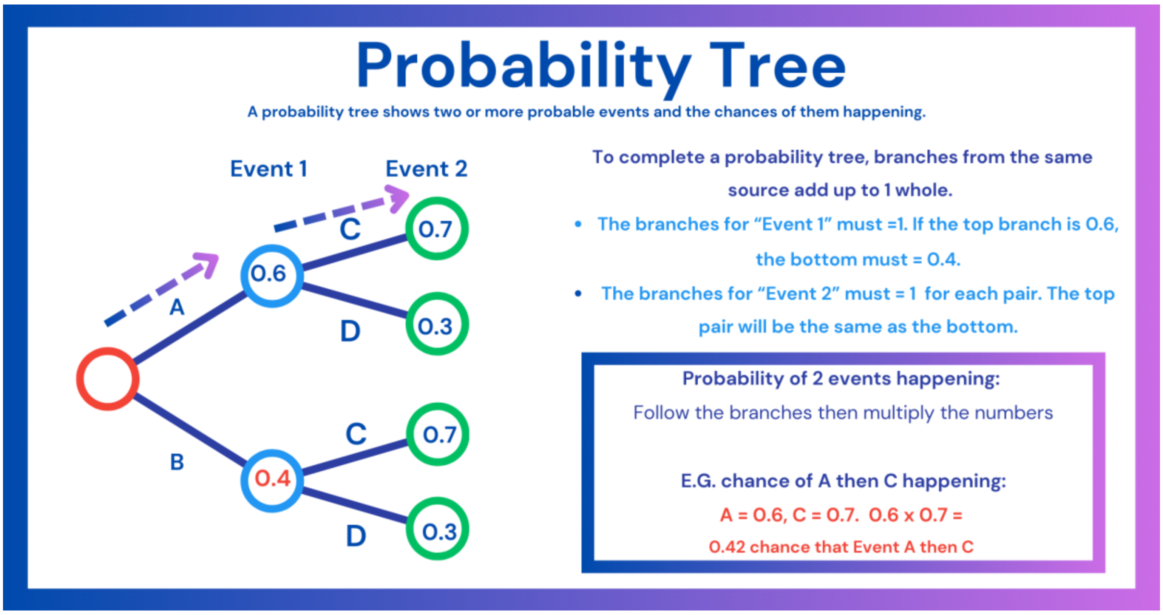
1. To complete the table, learners need to figure out what is missing.

- Within 1-5 miles total is 25, boys are 15.
  25-15 = 10 Girls
- Over 5 miles total is 20, girls are 15.
  20-15 = 5 Boys
- Girls 1-5 miles – 10, Over 5 miles = 15.
  10 + 15 = 25 in Girls in total

	Boys	Girls	Total
Within 1-5 miles	15	10	25
Over 5 miles	5	15	20
Total	20	25	45

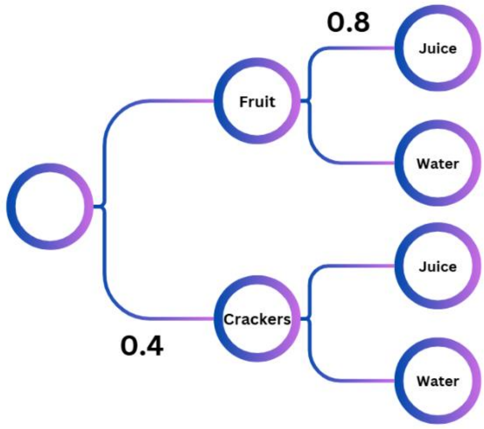
2. Child over 5 miles means both boys and girls who live **over 5 miles = 20**, total **children = 45**.
   Probability can be $\frac{20}{45}$ or calculated 20 ÷ 45 = **0.44 or 44%**

Probability Trees



Example Activity:

At the nursery, children have two choices for their snack: **fruit** or **crackers**. After choosing a snack, they can select a drink: **juice** or **water**. Calculate the probabilities of different combinations of snack and drink choices.



1. Complete the probability tree.

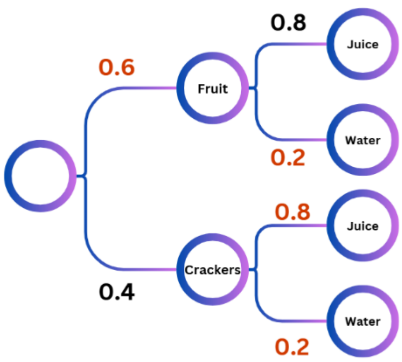
2. What is the probability that a child chooses **fruit and juice**?

Answer:

1. This probability tree is decimals but could be fractions or percentage. Fruit + crackers must = 1 whole. Juice + water = 1 whole.

   1 – 0.4 = 0.6 children picked fruit
   1 – 0.8 = 0.2 children chose water.

   Both sets of secondary branches are the same (juice and water) so the probabilities will be the same.



2. P of fruit = 0.6. P of juice = 0.8
   To find the probability of both events happening, we multiply.

   0.6 x 0.8 = 0.48 probability of a child having fruit and juice

Tips and Misconceptions

- Ensure probabilities add up to 1 for all outcomes in the scenario – no matter how many events used, they MUST always add up to 1.

- For fractions, simplify your answers when possible. You will not loose marks if you don't, but it is good practice and will support with fraction calculations.

- Read the question carefully to distinguish between independent and dependent events.
  - Independent are those that do not affect the outcome of another (flipping a coin and rolling a die together).
  - Dependent events are where it does effect (picking out a child at random, removing them from the room then picking another child)

- Learners may forget to multiply probabilities along the branches of a probability tree.

Building Your Own Activities

- Relatable activities could focus around predicting attendance, snack preferences, weather or outcomes of dice rolls during games.

- Learners can make their own data collection to use for probability to understand. These can be distance travelled to nursery and length of stay, or gender and age. They can even use anonymised data from apprenticeships.

- Include activities that have probability trees for multi-step scenarios (e.g., flipping a coin twice).

- Include both independent and dependent event questions to assess understanding.

- Provide visual aids like spinners or two-way tables related to the activity (for example 2-way tables linked to boy: girl ratio in the baby room etc). This will help focus and engage the learners.

Exam-style Questions

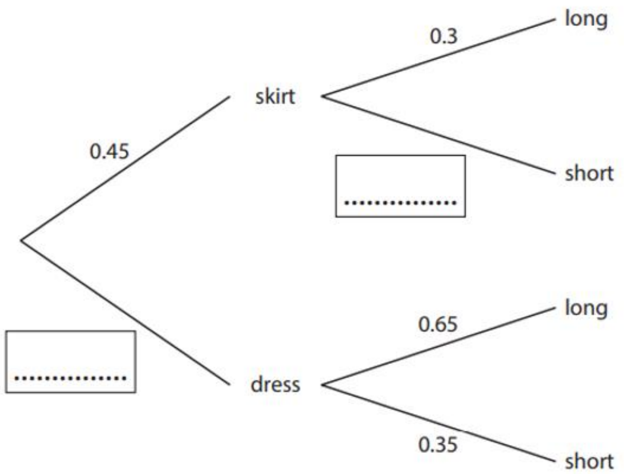
Question taken from Pearsons Functional Skills practice past paper.

The tree diagram shows the probability that an item of clothing selected at random is

- a skirt or a dress
- long or short.

(a) Complete the probability tree diagram.

(2)



An item of clothing is chosen at random.

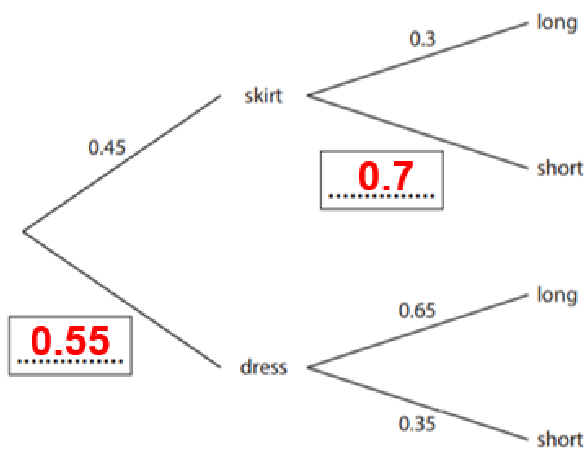
(b) Work out the probability that this item is a long skirt.

(2)

Work Through

a) To calculate the missing lengths, learners need to know that both branches will add up to = 1 Whole (Skirt + dress = 1, Long + short = 1)

1 – 0.45 = 0.55
1 – 0.3 = 0.7



b) Calculate the item being a long skirt. Learners need to multiply along the branches of “Skirt” then “Long”.

0.45 x 0.3 = 0.135 chance that the item picked is a long skirt

Further Links and Extensions

The following ETF resource offers support with the skills of area and perimeter

- ETF classroom resources

The following links are unaffiliated with ETF but also provide support

- Khan Academy
- Skills workshop
- Transum maths
- BBC Bitesize

To support with probability, it is good to combine with fractions, decimals, and percentage recap work. This way learners can use these components with a practical aspect.

Graphs and Data

Applications & Understanding

- Graphs are visual tools to display data, like tracking how long children spend on activities or identifying trends between activities and joy.
- There are many graphs that can be used, but Level 2 focuses on scatter graphs and their understanding. Please note the term scatter diagram might also be used but means the same thing.
- Scatter graphs are graphs that show relationship between 2 sets of data.
- They are used to identify and predict trends.
- Level 2 learners will face questions that ask them to draw and interpret scatter diagrams and discover patterns.
- For example, a scatter graph used to compare the number of hours children spend on outdoor play versus indoor activities.

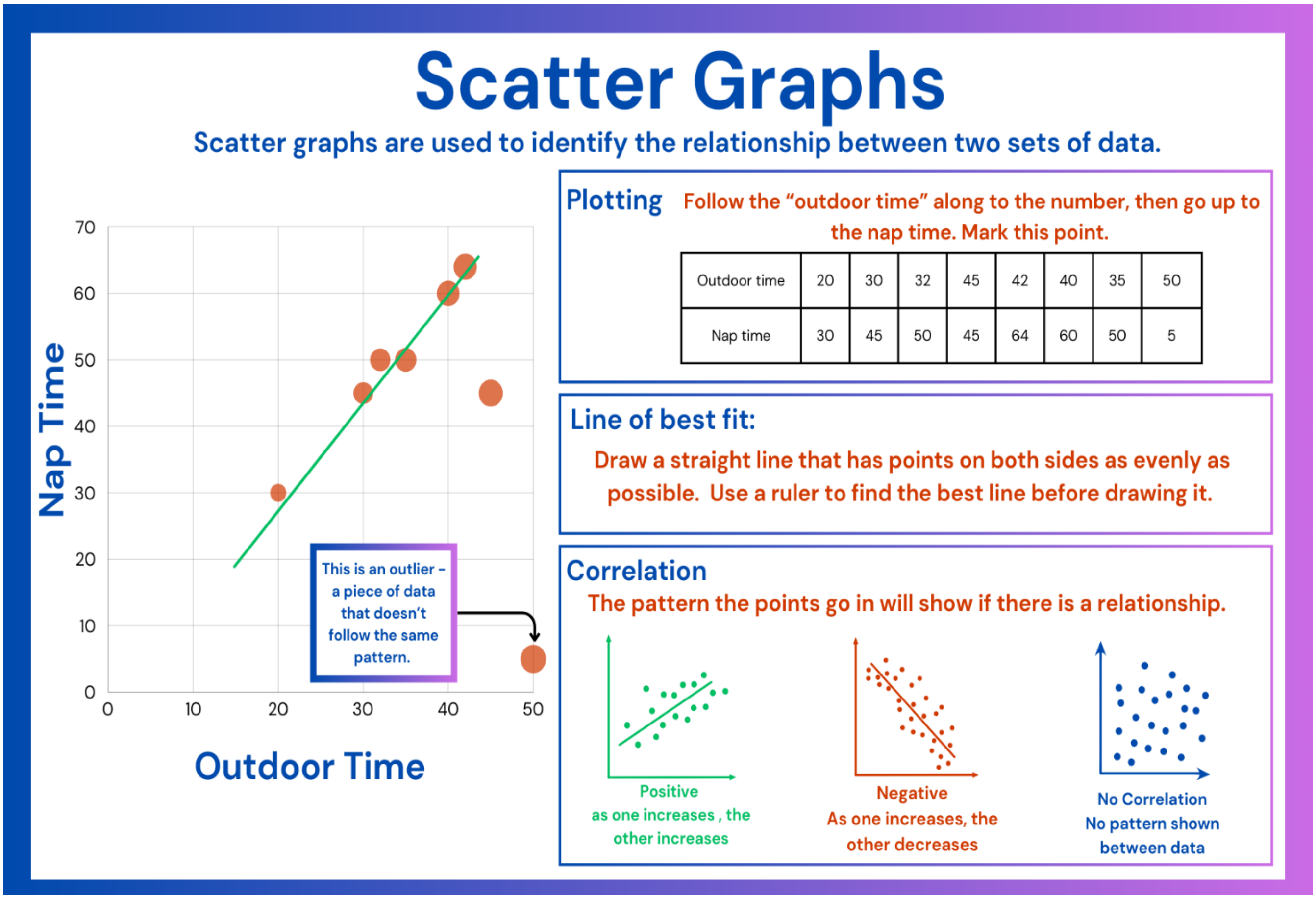
What Learners Should Already Know

Learners should understand the use of bar charts, line graphs and pictograms. These are all the basics of graphs and have occasionally appeared as 1- or 2- mark question. These will also help learners to understand the use of the X and Y axis (X goes across, Y goes up and down).

Learners should have a general understanding of increasing units to create the graphs and create equal space between numbers.

Methods and Example Activities

Scatter Graphs



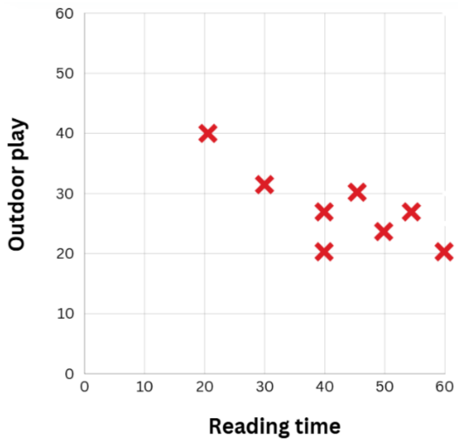
Example Activity

Here is some data showing children's reading time and their outdoor play.

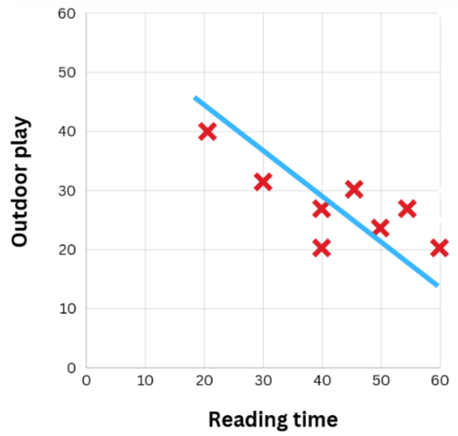
1. **Plot this data onto a scatter graph.**
2. **Draw a line of best fit.**
3. **Describe the relationship between reading time and outdoor play.**

Child	A	B	C	D	E	F	G	H
Reading Time (mins)	20	30	40	50	60	55	45	40
Outdoor play (mins)	40	32	28	25	20	28	30	20

Answers



1. Using the graph, begin plotting. For plot A start with the x axis (reading time).
   - Go across until you reach **20**. Then go up until you reach **40** on outdoor play.
   - Mark this with a dot or an x. Repeat this with Child B-H.



2. The line of best fit will fall with equal points either side. There are 8 points, so estimate of 4 either side. Use a ruler to make it as accurate as possible.

3. The relationship is clear. The line is going down which means there is a negative correlation.
   Learners can describe this as a negative correlation between outdoor play and reading time. As time spent in outdoor play increases, the amount of time spent reading decreases.

Tips and Misconceptions

- Label both axes clearly, with appropriate units and titles. This is to avoid confusion and is also awarded marks if on a “create a graph” question.
- Use a ruler to draw an accurate line of best fit when required. Remember – line of best fit is an estimate, trying to put equal numbers either side of the line.
- Identify the type of correlation: positive, negative, or none, as questions will ask this. Be careful as some data may not have a correlation but learners may think it does.

Building Your Own Activities

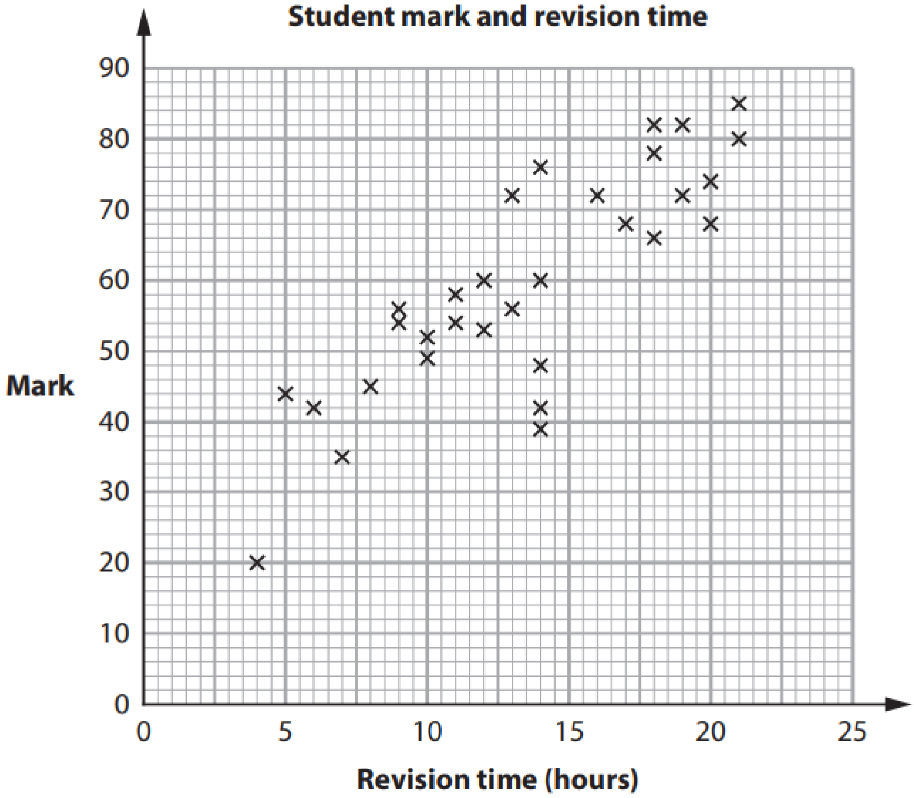
- Use childcare-related examples, such as hours of outdoor play vs. nap time. Ask learners to analyse the data given from these graphs and make suggestions to improve (i.e., children show a pattern of more outdoor = more sleep)
- Provide questions that have them completing their own graphs but also interpreting completed graphs. Data can be linked to their apprenticeship reading.
- Ask learners to describe trends and make predictions based on the graph.
- Include scatter graphs with no correlation to assess interpretation skills.

Exam-style Questions

Exam question taken from Edexcel Functional Skills Level 2 practice.

Ms Daly gives her students one week to prepare for a maths test.

The scatter diagram shows the number of hours spent on revision and the mark in the test for each of 31 students.



Another student revised for 12 hours and scored 45 marks on the test.

(a) Plot this point on the scatter diagram.

(1)

(b) What type of correlation does the scatter diagram show?

(1)

Ms Daly uses the scatter diagram to recommend how much revision time students need to get a high mark on the test.

(c) What percentage of the students who revised for more than 15 hours scored over 70 marks in the test?

(3)

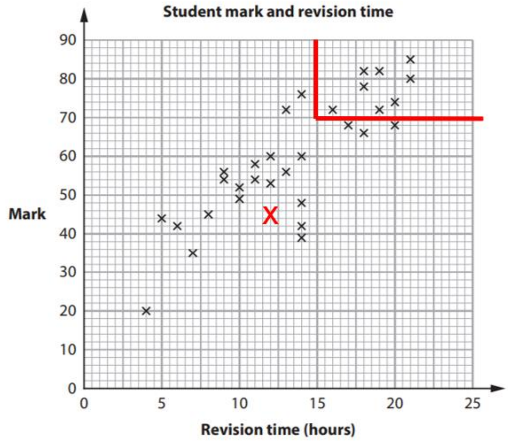
Work Through

a) Plot on the graph. Go along to 12 hours then up to 45 marks – plot with an x.

b) The data shows a positive correlation and shows that as revision time increases, marks increase.

c) To find the percentage of learners who revised more than 15 hours and 70 marks, learners need to see the plots that fit in this range.

Draw lines around the range: anything that is above 15 hours AND 70 marks (as shown on the example).



This means 8 plots are in range of what the question asks. There are 32 students (31 at the start but learners added one more).

As a fraction: $\frac{8}{32} = \frac{1}{4}$.

As a percentage – **1 ÷ 4 x 100 = 25 %**

Further Links and Extensions

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Graphs are a useful thing to recap for learners, and some questions may include calculating the averages of these graphs and tables. As an extension with graphs learners could explore fractions and percentages. As shown in the exam question, these are a common exam extension that is shown across different exam boards. Use the link below for support.

Percentages

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