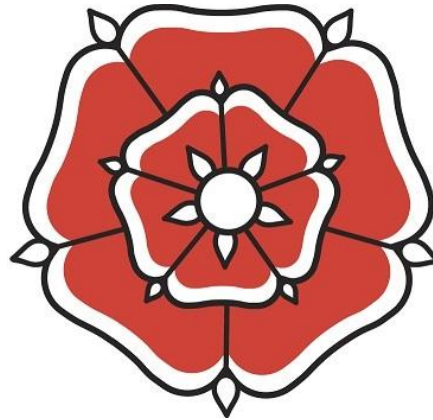


Maidenhill School

Knowledge Organiser

Year 10 – Term 3



Be kind, Aspire, Persevere, Achieve

Name:

Tutor: 10



Week 2	Notes
Monday 5 th January	INSET DAY
Tuesday 6 th January	
Wednesday 7 th January	
Thursday 8 th January	
Friday 9 th January	
Week 1	Notes
Monday 12 th January	
Tuesday 13 th January	
Wednesday 14 th January	
Thursday 15 th January	
Friday 16 th January	

Week 2	Notes
Monday 19 th January	
Tuesday 20 th January	
Wednesday 21 st January	
Thursday 22 nd January	
Friday 23 rd January	
Week 1	Notes
Monday 26 th January	
Tuesday 27 th January	
Wednesday 28 th January	
Thursday 29 th January	
Friday 30 th January	



Week 2	Notes
Monday 2 nd February	
Tuesday 3 rd February	
Wednesday 4 th February	
Thursday 5 th February	
Friday 6 th February	
Week 1	Notes
Monday 9 th February	
Tuesday 10 th February	
Wednesday 11 th February	
Thursday 12 th February	RP2 Published
Friday 13 th February	



Self-certification

Every student is entitled to self-certify to go to the toilet on 2 occasions each term, when they do not have a medical exemption (this is issued by school only, in conjunction with parents). This will equate to 12 opportunities a year.

Sign below and show to your teacher. If you have a reason that requires this page to be refreshed before the end of term, please speak to your Head of Year.

Date	Time	Student signature

Insert medical exemption here (Head of Year)
Review/end date:

Student out of lesson record

Date and time	Reason	Staff signature

Have a problem?
Worried about someone or something?
Need someone to talk to? Scan the QR code and let us know.

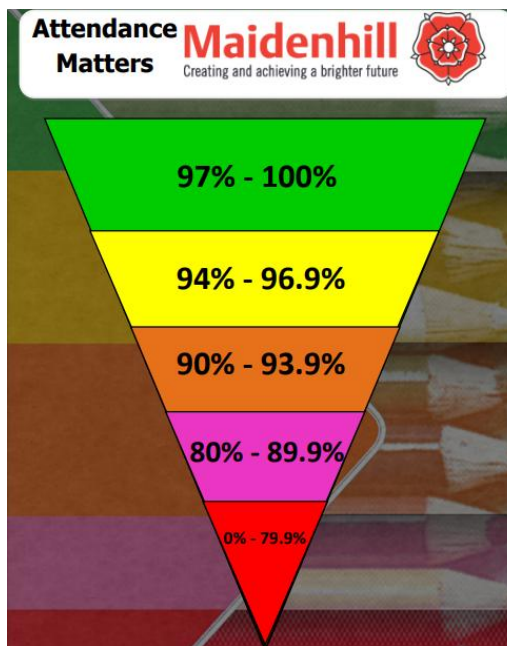
Reporting your concerns



Attendance Matters



Attendance Groups	
Green	Expected Attendance
Yellow	Risk of Underachievement
Amber	Serious Risk of Underachievement
Pink	Severe Risk of Underachievement (PA)
Red	Extreme Risk (PA)



Personal Attendance Record

Week	Monday	Tuesday	Wednesday	Thursday	Friday	%	Colour	↑ → ↓
1								
2								
3								
4								
5								
6								

Home School Agreement and uniform expectations



As a student of the school I will:

- Attend school every day and on time
- Represent the school in a positive way on my way to and from school
- Wear the correct school uniform smartly at all times
- Ensure I have downloaded the ClassCharts app and actively use the platform so that I am up to date with notifications regarding my behaviour, attendance, homework and detentions
- Follow the "Maidenhill Expectations" for all students regarding their Behaviour for Learning and uphold the school's expectations to 'Be kind, Aspire, Persevere and Achieve'
- Not use my mobile phone in school
- Go to reception if I need to contact home
- Be polite and considerate to all members of the school community
- Ensure that my behaviour has a positive impact on other students' learning and progress
- Refuse to take part in bullying or anti-social behaviour, including on social media
- Take responsibility for my own learning and actively participate in lessons
- Actively seek ways to improve my work and respond effectively to feedback
- Complete all my classwork and homework to the best of my ability and on time
- Respect the environment of the school and its neighbourhood, and help to keep it clean and tidy, free from litter and graffiti
- Represent the school in a positive way in the local community and when participating in school activities or visits, and on social media
- Talk with my parent(s)/carer(s) and school staff about any concerns in school
- Pass any written correspondence to my parents'/carers' on the day they are issued
- Interact positively with any school social media platforms.

Student Signature

Maidenhill Uniform

- ❖ Maidenhill school blazer needed at all times
- ❖ Maidenhill school tie
- ❖ Long or short sleeved plain white shirt, **tucked in when in the school building**
- ❖ Plain black, smart, tailored trousers
- ❖ Footwear should be a shoe and not a boot, and entirely black
- ❖ White, grey or black socks with no logos
- ❖ Black or nude tights. No patterns.
- ❖ Optional
 - Maidenhill skirt
 - Maidenhill shorts
 - Simple black belt
 - Maidenhill jumper



- ❖ Jewellery must be easily removed for practical lessons. Earrings must be studs and not dangle. Necklaces should be underneath the shirt
- ❖ Make-up should be discreet
- ❖ Hair must not be of extreme style or colour. Long hair should be tied back for health and safety reasons in certain subjects



Maidenhill PE Uniform

- ❖ **NO JEWELLERY**
- ❖ Red Maidenhill PE polo shirt
- ❖ Red Maidenhill hooded jumper
- ❖ Optional Rugby shirt
- ❖ Options for the lower half:
 - Plain black shorts with less than 5cm logos
 - Black tracksuit bottoms with less than 5cm logos
 - Maidenhill leggings
 - Maidenhill skort
 - Plain black leggings with no logos
- ❖ Socks
 - White or black
 - Red needed for all fixtures
- ❖ Shoes
 - Suitable trainers
 - Optional studded boots for football/rugby



Equipment and acceptable use of the school ICT facilities



Equipment

You should be fully equipped for every lesson. Make sure you have the correct books for each lesson. It is always a good idea to pack your school bag the night before. Remember to check your timetable first. Here is a useful checklist.

Essential requirements

- ☐ At least 2 black pens
- ☐ Green pen
- ☐ 2 pencils and 2 x 2b or 4b pencils for Art, Design and Nutrition
- ☐ Ruler
- ☐ Rubber
- ☐ Pencil sharpener
- ☐ Scientific calculator
- ☐ Whiteboard and whiteboard pen
- ☐ Headphones for music
- ☐ Reading book
- ☐ Plastic wallet and knowledge organiser

Student property

You are expected to have your clothing marked with your name and, wherever possible, all other items of property which you are expected to bring to school with you such as bags, pencil cases and PE kit named too.

Money, bus passes and other similar items of value should always be carried with you and never left in bags around the school at break and lunchtimes.

You have the opportunity, if you wish, to hand valuables to a teacher before PE and arrangements will be made for safe keeping. The changing rooms are not always locked during lessons. If you do not do this, the school cannot guarantee full security for your property.

Network rules

Never share your password with anyone – not even your best friend – if you suspect that someone knows it, change it or see an ICT technician as soon as possible

Never share your user area with anyone – email files to a friend or home as an attachment, or use Office 365 “One Drive”

Always log off before leaving a computer

Never tamper with ICT equipment, if your PC or laptop is damaged or not working properly, please inform a member of staff immediately. DO NOT disconnect, reconnect or move or swap any cables at any time

Never give a stranger any information about you or your home

Always communicate with strangers politely – ask a teacher to check before sending

Don't suffer bullying – report and give a printout of any email or other material that offends you to a teacher

Avoid the spreading of computer viruses – from the internet or home. Keep your home virus checking software up to date

Do not attempt to download or install software – use only the software provided

Always give credit for information obtained from the internet

Do not eat or drink close to electronic equipment or in any computer room

Use your printing credits with care – extra print credits in any one week can only be obtained through the permission of a teacher whose work you need to print

The use of the internet at school must be in support of learning. The use of all chat systems is strictly forbidden. Inappropriate use will result in access being withdrawn. A log of all internet access and activity is monitored throughout the day by the network staff so misuse of the system can be quickly identified and dealt with.

To access email from home, log on to rmunify.com. School emails should only be used to communicate with staff/students about school related matters. You can also speak with staff via the message function on ClassCharts.

Visit the website ‘thinkyouknow’ for essential and excellent advice on using the internet safely outside of school.





At Maidenhill School we believe that students have the right to learn, and teachers have the right to teach.

When you make good choices and follow the rules, you will be rewarded.

Rewards

You can collect positive reward points in lessons and for completing quality homework. Rewards can be spent in the reward shop at the end of each term on vouchers, chocolate, stationery and much more! We have end of term rewards and end of year rewards in the form of our activities week, all to recognise the positivity and hard work you show each and every day.

If you make poor choices and do not follow the rules, then a clear set of consequences will follow.

Consequences

C2 – This is a verbal warning

C3 – Issued with a BFL detention of 40mins

C3r – This is when you are sent out of a lesson, and you must move to the referral room. You will be issued with a 55mins detention. Those students that are removed from lesson five times in a term, will then receive a 1 day internal isolation in the refocus room for every subsequent C3r. This will be reset at the start of the next term

C4 – Isolation in the refocus room

C4e – Educated off site at an alternative provision

C5 – Fixed term suspension

C5 Exclusions

If a student receives a C5 they will be excluded from school for a fixed period of time.

Incidents for which a students may be excluded include:

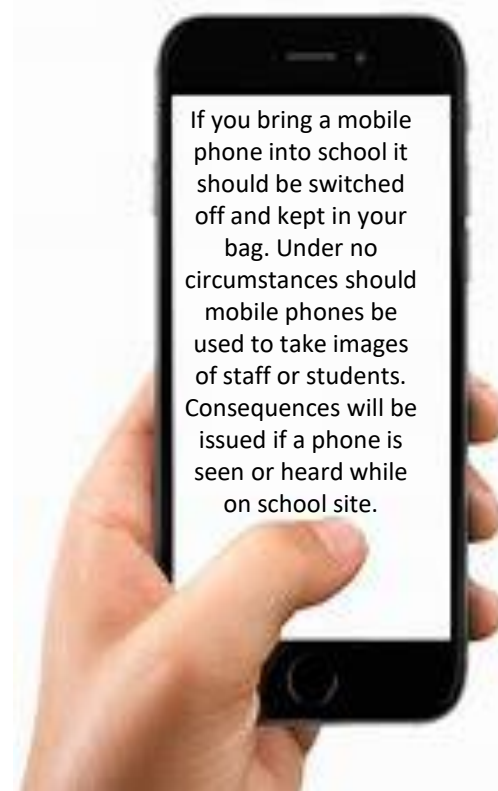
- In possession, under the influence of or dealing in illegal drugs. This also extends to alcohol and other toxic substances
- Serious physical or verbal aggression towards others
- Serious rudeness, defiance, threatening behaviour or inappropriate language towards a member of the school staff
- Anti-social behaviour such as theft or damage to property
- A build-up of incidents which are unacceptable and contravene school standards
- Repeated disruption and defiance which has disturbed the learning of other students
- Persistent poor behaviour

If a student persistently behaves in an unacceptable manner, this could lead to a permanent exclusion.

In exceptional circumstances, it is appropriate for the Headteacher to permanently exclude a student for a first offence. These might include such things as:

- Serious actual or threatened violence against another individual
- Sexual abuse or assault
- Supplying an illegal drug
- Carrying an offensive weapon

The school can take no responsibility for valuable items brought into school by students (so students are advised not to bring in expensive items).



The following items are not allowed to be brought into school:

- Alcohol and drugs
- Knives and other weapons
- Fireworks
- Cigarettes/e-cigarettes, vapes, tobacco, matches and lighters
- Tippex or other correcting fluids
- Aerosols
- Illegal substances
- Energy/fizzy drinks

Smoking is not permitted in school or on the way to and from school. Students found to be smoking/vaping or in possession of smoking/vaping equipment will receive a significant sanction.



What is bullying?

Bullying is when one person or a group of people deliberately hurt, threaten or frighten someone over a period of time. It can be physical; like punching or kicking, or emotional like teasing or calling names.



Bullying includes repeated:

- Hitting
- Insults
- Cruel nicknames
- Making threats
- Isolating someone
- Damaging, taking or hiding property
- Writing or telling lies about someone
- Sending cruel text messages, video messages or emails
- Spreading rumours
- Being unfriendly and turning others against someone
- Posting inappropriate comments on websites and social media

Types

- Physical
- Cyber
- Verbal
- Emotional
- Prejudice based

If you are being bullied, do not suffer in silence:

- Be firm – look the bully in the eye and tell them to stop
- Get away from the situation as quickly as possible
- Tell an adult, peer or friend what has happened, straight away
- If you are scared to tell someone, get a friend to go with you
- Keep on speaking up until someone listens
- Don't blame yourself for what has happened

If you are being bullied, you can expect that:

- You will be listened to and taken seriously
- Action will be taken to help stop the bullying
- You will be involved in the process of deciding what action to take to stop the bullying and any worries that you may have will be listened to and respected
- You will be given the opportunity to talk about the way that the bullying has made you feel and to find strategies to deal with these feelings and to understand and cope with bullying behaviour
- If you are ever in fear of your physical safety, staff will take immediate action to keep you safe

When you are talking about bullying, be clear about:

- When it started
- What has happened to you
- How often it has happened
- Who was involved
- Who saw what was happening
- Where and when it happened
- What you have already done about it

Review Point 2



	Attitude to Learning		Attitude to homework		Organisation	
Outstanding because student...	<p>...always engages with activities showing resilience when challenged</p> <p>...actively seeks ways to improve work and responds effectively to feedback</p> <p>...demonstrates consistently high levels of effort and focus</p>	Consistent Persevere, Aspire, Achieve	<p>...always demonstrates high levels of determination and motivation</p> <p>...works hard to proof read homework for spelling, punctuation and grammar (SPAG)</p> <p>...shows great pride in their presentation of homework</p>	Quality homework	<p>...is always on time to lessons and enters the classroom ready to learn</p> <p>...always brings correct equipment</p> <p>... always meets deadlines and is well prepared for tests, assessments and exams</p>	No equipment or late marks
Good because student...	<p>...engages with activities often showing resilience when challenged</p> <p>...improves their work by responding to feedback</p> <p>...demonstrates high levels of effort and focus</p>		<p>...often demonstrates determination and motivation</p> <p>...proof reads homework for spelling, punctuation and grammar (SPAG)</p> <p>...shows pride in their presentation of homework</p>		<p>...is on time to lessons and enters the classroom ready to learn</p> <p>...brings the correct equipment</p> <p>...meets deadlines and is prepared for tests and exams</p>	
Not yet good because student...	<p>...sometimes engages with learning activities but can be passive</p> <p>...responds to feedback but doesn't always work hard enough at this</p> <p>...sometimes demonstrates high levels of effort and but not consistently</p>	C3 Behaviour / C3 Inadequate Learning Profile / C3r	<p>...sometimes demonstrates determination but sometimes effort is below expectation</p> <p>...checks homework for spelling, punctuation and grammar (SPAG) but could put more effort into this</p> <p>...could take more pride in their presentation of homework</p>	Homework completed	<p>...does not always arrive on time and/or is not always ready to learn.</p> <p>...sometimes forgets to bring the correct equipment for learning</p> <p>...sometimes does not meet deadlines and/or is not prepared for tests and exams</p>	Equipment and late marks
Urgent improvement required because student...	<p>...rarely engages with learning activities but not at the standard expected</p> <p>...rarely improves their work by responding to feedback and doesn't put enough effort into this</p> <p>...can make poor choices regarding behaviour and/or disrupts the learning of others</p>		<p>...rarely demonstrates determination and effort is often below expectation</p> <p>...makes insufficient effort to proof read for spelling, punctuation and grammar (SPAG)</p> <p>...rarely takes pride in their presentation of homework</p>		<p>...is often late to lessons and/or often enters the classroom not ready to learn</p> <p>... often lacks the correct equipment</p> <p>...often misses deadlines and/or is often unprepared for tests and exams</p>	
X	Teacher is unable to comment due to student absence.		Teacher is unable to comment due to student absence.		Teacher is unable to comment due to student absence.	10



Subject	Attitude to Learning	Attitude to Homework	Organisation	Y11 MEG	Progress
English language					
English literature					
Maths					

Reflections

What Went Well – what have you made progress in?

1.
.....
.....
2.
.....
.....
3.
.....
.....

Next steps:

My first key area for development is

.....
.....

I will do this by

.....
.....
.....

My second key area for development is

.....
.....

I will do this by

.....
.....
.....

100 Colorful Words to Use in Place of "Said"

Rhyme
Rhyming words occur very often in poems, sometimes in patterns.

Rhythm
The flow of a poem, often effected by the punctuation and shape of a poem.

Onomatopoeia
When a word imitates the sound it makes (e.g. BANG, SPLASH)

Similes
Compares two different things, using the words "like" or "as".

Metaphors
Identifies something as being the same as something else.

Alliterations
More than one word beginning with the same letter (close together in text).

Repetition
When words and phrases are repeated multiple times.

POETIC TECHNIQUES

admitted
advised
agreed
assured
avowed

began
bragged
chatted
cheered
commented
convinced
crowded
exclaimed
gushed
instructed

bawled
complained
confessed
cried
croaked
denied
fretted
gasped
groaned
gurgled
moaned
mumbled
objected
pleaded
protested
sniffled
sobbed
squeaked
stammered

argued
barked
bellowed
boasted
boomed
coughed
demanded
gripped
growled
hissed
insisted
interrupted
jeered
ranted
raved

added
asked
babbled
bargained
blurted
chortled
clucked
explained
grumbled
gulped
grunted
lied
murmured
mused
muttered

LITERARY DEVICE	DEFINITION	EXAMPLE
Simile	A comparison using "like" or "as"	Her eyes were like shining stars
Metaphor	A comparison without using "like" or "as"	Life is a journey
Personification	Giving human qualities to non-human things	The wind whispered through the trees
Hyperbole	An exaggeration for emphasis	I've told you a million times
Alliteration	Repetition of the same sound at the beginning of words	Peter Piper picked a peck of pickled peppers
Onomatopoeia	Words that sound like what they mean	Buzz, hiss, sizzle
Irony	A contrast between what is expected and what actually happens	A fire station burning down
Foreshadowing	Hinting at what will happen later in the story	The ominous music in a horror movie
Symbolism	Using objects or actions to represent ideas or qualities	A dove as a symbol of peace
Imagery	Descriptive language that creates a picture in the reader's mind	The sun set over the ocean, painting the sky with shades of orange and pink

Common Techniques

D DIRECT ADDRESS
A ALLITERATION
F FACT
O OPINION
R RHETORICAL QUESTION
R REPETITION
E EMOTIVE LANGUAGE
S STATISTICS
T THREE (LIST OF)
I IMPERATIVE

Transactional Writing

- Letters
- Reviews
- Reports
- Articles





Conjunctions

Addition

Further
Also
Too
Besides
Finally
Last
Additionally
In addition
Then

Summary

In short
In other word
Anyway
In brief
It seems
Clearly
In sum
After all
In general

Place

There
Here
In the back
Adjacent to
Next to
Nearby
Beyond
Opposite to
At that point

Example

Such as
For one thing
For instance
For example
That is
Specifically
Illustrated by
In particular

Comparison

Equally
A similar ...
Likewise
Similarly
Comparable
As with
Another ... like
In the same way

Time

Meanwhile
Finally
At last
Presently
Currently
In the past
In the meantime
Eventually
Immediately

PUNCTUATION

QUESTION MARK

?

Use at the end of a sentence to express asking a question.

EXCLAMATION MARK

!

Use at the end of a sentence to express a strong feeling.

PERIOD

.

Use at the end of a sentence.

COLON

:

Use to introduce a list or a definition.

APOSTROPHE

'

Use in contractions and to show when something belongs to someone.

PARENTHESIS

()

Use to add extra information to a sentence without taking away from the idea.

HYPHEN

-

Use to join separate words to make one word.

SEMICOLON

;

Use to connect subjects and verbs into a single sentence.

COMMA

,

Use to separate parts in a sentence or in a list.

QUOTATIONS

" "

Use around words that are spoken.

ELLIPSIS

...

Use to show suspense or that someone is thinking.

THERE →

(Refers to a place)
He went in the door over there.

THEIR ↑

(Shows ownership)
Their cat is the sweetest.

THEY'RE

(A contraction for "they are")
They're going to the movies.

Verbs to sharpen your analysis

THIS SHOWS	THIS SUGGESTS	THIS HIGHLIGHTS	THIS INTERESTS
Demonstrates Reveals Exposes Discloses Uncovers Encapsulates Proves Validates Exhibits Establishes Denotes Displays Flaunts Showcases Presents	Implies Infers Hints at Signifies Connotes Denotes Insinuates Intimates Advocates Poses Conjures Symbolises Points towards Indicates Alludes to	Emphasises Stresses Reinforces Spotlights Underlines Accentuates Underscores Foreshadows Exaggerates Reiterates Magnifies Zeroes in on Promotes Publicises Pinpoints	Fascinates Amuses Satisfies Terrifies Enthrals Enthuses Stimulates Galvanises Animates Rouses Stirs Placates Provokes Deceives Astonishes





Multiplication Table Grid I-12

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Unit 10 – Transformations (Foundation)

What do I need to be able to do?

By the end of this unit, you should be able to:

Describe and carry out:

- Translations
- Rotations
- Reflections
- Enlargements
- Combinations of the above

Keywords:

Translation: A slide that moves every point of a shape the same distance in the same direction.

Rotation: A turn of a shape around a fixed point (the centre of rotation) by a certain angle in a clockwise or anti-clockwise direction.

Reflection: A flip of a shape across a line (the line of reflection), creating a mirror image.

Enlargement: A change in the size of a shape by a scale factor, which can make it larger or smaller while keeping the shape similar.

Object: The starting shape

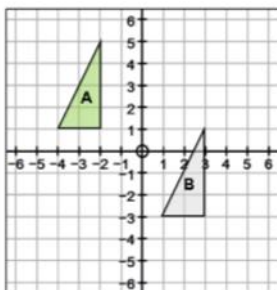
Image: The resulting shape, after you have completed the transformation

Translations (U196)

Describing Translations

State...

1. Movement left or right
 2. Movement up or down
- Or write the column vector



- Translation of 5 to the right and 4 down

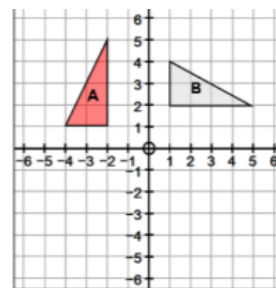
$$\begin{pmatrix} 5 \\ -4 \end{pmatrix}$$

Rotations (U696)

Describing Rotations

State...

1. The centre of rotation
2. The angle of rotation
3. The direction of rotation



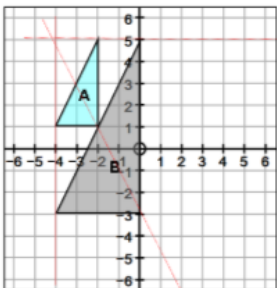
- Centre of rotation is (0,0)
- Angle of rotation is 90°
- Direction of rotation is clockwise

Enlargements (U519)

Describing Enlargements

State...

1. Centre of enlargement
2. Scale Factor



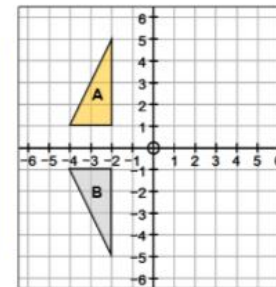
- The centre of enlargement is (-4, 5)
- The scale factor is 2

Reflections (U799)

Describing Reflections

State...

1. The line of symmetry



- The line of symmetry is the X axis

The **scale factor** tells us how many times larger the lengths in the new shape (image) are than in the original shape (object).

If the scale factor is **positive** the shape will get **larger**.

If the scale factor is **negative** the shape will get **smaller**.

Combining Transformations (U766).

We can be asked to perform multiple operations on the same shape. Ensure you do them in the order they are given and clearly label your final shape.

Enrichment



Unit 11 – Ratio and proportion (Foundation)



What do I need to be able to do?

By the end of this unit you should be able to:

- Write and simplify a ratio
- Divide a quantity into a given ratio
- Write ratios in form $n:1$ and $1:n$
- Compare ratios and fractions
- Recognise and use direct proportion
- Solve problems using ratio and scale factors

Keywords

Ratio: a statement of how two numbers compare

Equivalent: of equal value

Proportion: a statement that links two ratios

Integer: whole number, can be positive, negative or zero.

Fraction: represents how many parts of a whole.

Denominator: the number below the line on a fraction. The number represents the total number of parts.

Numerator: the number above the line on a fraction. The top number. Represents how many parts are taken

Origin: (0,0) on a graph. The point the two axes cross

Compare with ratio U687

"For every dog there are 2 cats"



Dogs: Cats
1:2

Units have to be of the same value to compare ratios

The ratio has to be written in the same order as the information is given.

e.g. 2:1 would represent 2 dogs for every 1 cat.

Ratio in 1:n and n:1

Show the ratio 4:20 in the ratio of 1:n

The question states that this part has to be 1 unit.
Therefore Divide by 4

$$\begin{array}{c} 4 : 20 \\ \swarrow \quad \searrow \\ 1 : 5 \end{array}$$

This is asking you to cancel down until the part indicated represents 1.

This side has to be divided by 4 too – to keep in proportion

Ratio and scale

A picture of a car is drawn with a scale of 1:30



The car image is 10cm

$\times 10$

Image : Real life

1cm : 30cm
10cm : 300cm

$\times 10$

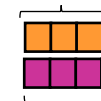
Sharing a whole into a given ratio U557

James and Lucy share £350 in the ratio 3:4.
Work out how much each person earns

James:
Lucy

3 : 4

James



Lucy

£350

Find the value of one part

Whole: £350

7 parts to share between

(3 James, 4 Lucy)

$$£350 \div 7 = £50$$

□ = one part = £50

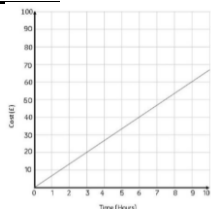
Put back into the question

James: Lucy

$$\begin{array}{c} \text{James: Lucy} \\ \text{3 : 4} \\ \swarrow \quad \searrow \\ \text{£150 : £200} \end{array}$$

Direct Proportion and Graphs

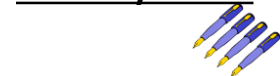
U238



A graph which shows a direct proportion will...

- Form a straight line
- Pass through (0,0)

Best buys U721

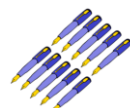


4 pens costs £2.60

$$£2.60 \div 4 = \underline{\underline{£0.65}}$$

"1 pen costs..."
"1-pound buys..."
£

$$4 \div 2.60 = \underline{\underline{1.54 \text{ pens}}}$$



10 pens costs £6.00

$$£6.00 \div 10 = \underline{\underline{£0.60}}$$

$$10 \div 6 = \underline{\underline{1.67 \text{ pens}}}$$

You could work out how much 40 pens are and then compare

Compare the solution in the context of the question

The best value has the lowest cost "per pen"

The best value means £1 buys you more pens

Enrichment Opportunities



Unit 9 – Equations and Inequalities (Higher)



What do I need to be able to do?

- Completing the square
- Solving quadratic equations using factorising
- Solve an equation in the form $ax + by = c$ where x or y are given
- Solve simultaneous equations by elimination where coefficients of either x or y are the same
- Solve simultaneous equations by elimination where coefficients of either x or y are a multiple of the other
- Solve simultaneous equations by elimination where both equations need to be multiplied
- Set up two equations from context and solve
- Plot a quadratic and linear equation and find the points of intersection
- Solve simultaneous equations where one is quadratic by substitution where both in the form $y =$

Keywords

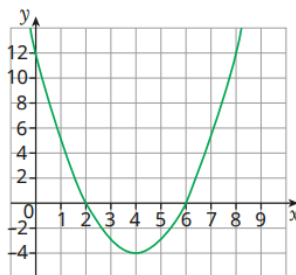
Solution - value of an unknown that satisfies an equation or inequality
Factorise - express an algebraic expression as a product of its factors using brackets; the reverse process of expanding brackets
Roots - value(s) of x where the quadratic equals 0
Coefficient - number in front of a variable indicating the multiple of the variable
Exact form - solution represented as an expression rather than a decimal approximation
Variable - symbol, usually a letter, that can represent any value in mathematical expressions,
Quadratic - equation or expression involving the second (and no higher) power of a variable or unknown, typically in the form $ax^2 + bx + c$

Solve by factorising (U228 and U960)

$$\text{Solve } x^2 - 8x + 12 = 0$$

$$(x - 2)(x - 6) = 0$$

$$\begin{array}{lcl} x - 2 = 0 & \text{or} & x - 6 = 0 \\ x = 2 & & x = 6 \end{array}$$



Solve by completing the square (U589)

$$\begin{aligned} x^2 - 8x + 9 &= 0 \\ (x - 4)^2 - 16 + 9 &= 0 \\ (x - 4)^2 - 7 &= 0 \\ (x - 4)^2 &= 7 \\ x - 4 &= \pm\sqrt{7} \\ x &= 4 \pm\sqrt{7} \\ x &= 4 + \sqrt{7} \text{ or } x = 4 - \sqrt{7} \end{aligned}$$

1. Make the equation equal to 0
2. Complete the square
3. Solve the perfect square

Solve using the quadratic formula (U665)

1. Compare with $ax^2 + bx + c$. Write the values of a , b , and c .
2. Substitute a , b and c into the quadratic formula
3. $+$ gives one solution and $-$ gives the other

$$\begin{aligned} &3x^2 - 5x + 1 = 0 \\ &a = 3 \quad b = -5 \quad c = 1 \\ x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\ x &= \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \times 3 \times 1}}{2 \times 3} \\ x &= \frac{5 \pm \sqrt{25 - 12}}{2 \times 3} \\ x &= \frac{5 \pm \sqrt{13}}{6} \quad x = \frac{5 + \sqrt{13}}{6} \text{ or } x = \frac{5 - \sqrt{13}}{6} \end{aligned}$$

Simultaneous Equations (U760)

1. Write the equations one above the other and number them
2. (Multiply each term in the equation so the coefficients are the same)
3. If the signs are the same subtract, if not, add
4. Solve
5. Find the unknown variable by substituting the known variable into one of the equations

$$\begin{array}{rcl} 2x + 5y & = & 24 \\ 4x + 3y & = & 20 \\ \hline 2x + 10y & = & 48 \quad (1) \\ 4x + 3y & = & 20 \quad (2) \\ \hline -7y & = & -28 \\ y & = & 4 \end{array}$$

$$\begin{aligned} 7y &= 28 \\ \div 7 &\div 7 \\ y &= 4 \\ 4x + 3(4) &= 20 \\ 4x + 12 &= 20 \\ -12 &-12 \\ 4x &= 8 \\ \div 4 &\div 4 \\ x &= 2 \end{aligned}$$

Enrichment Opportunities





Unit 10 Probability (Higher)

What do I need to be able to do?

- Solve problems using two-way tables and sample space diagrams
- Estimate the expected results for experimental probabilities.
- Draw and use tree diagrams to solve probability problems.
- Use set notation.
- Use Venn diagrams to solve conditional probability problems.

Experimental data U580

Theoretical probability

What we expect to happen

Experimental probability

What actually happens when we try it out

The probability becomes more accurate with more trials.
Theoretical probability is proportional

The more trials that are completed the closer experimental probability and theoretical probability become

Sample space

The possible outcomes from rolling a dice

U104

The possible outcomes from tossing a coin

	1	2	3	4	5	6
H	1,H	2,H	3,H	4,H	5,H	6,H
T	1,T	2,T	3,T	4,T	5,T	6,T

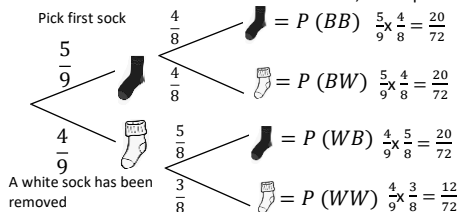
$$P(\text{Even number and tails}) = \frac{3}{12}$$

Dependent events

U558

The outcome of the first event has an impact on the second event

A sock drawer has 5 black and 4 white socks., Jamie picks 2 socks from the drawer.



NOTE: as "socks" are removed from the drawer the number of items in that drawer is also reduced \therefore the denominator is also reduced for the second pick.

Keywords

Event: one or more outcomes from an experiment

Outcome: the result of an experiment.

Intersection: elements (parts) that are common to both sets

Union: the combination of elements in two sets.

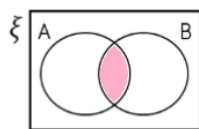
Expected Value: the value/ outcome that a prediction would suggest you will get

Universal Set: the set that has all the elements

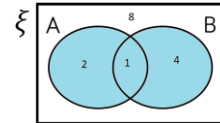
Systematic: ordering values or outcomes with a strategy and sequence

Product: the answer when two or more values are multiplied together.

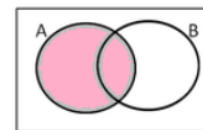
Venn Diagrams U296



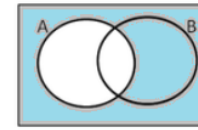
in set A AND set B
 $P(A \cap B)$



in set A OR set B
 $P(A \cup B)$



in set A
 $P(A)$



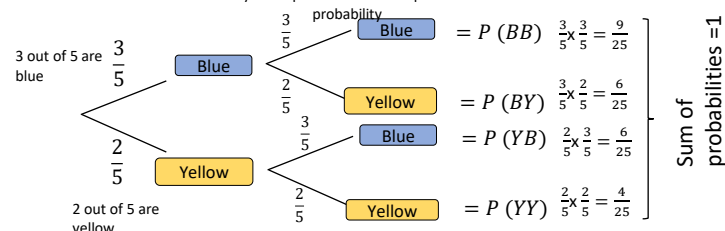
NOT in set A
 $P(A')$

Independent events U699

The outcome of two events happening. The outcome of the first event has no bearing on the outcome of the other

Isobel has a bag with 3 blue counters and 2 yellow. She picks a counter and replaces it before the second pick.

Because they are replaced the second pick has the same



Enrichment Opportunities

Nrich Maths. Puzzles to complete focusing on probability





Date	KO*	WB*	Case*	Date	KO*	WB*	Case*
5/1	INSET			26/1			
6/1				27/1			
7/1				28/1			
8/1				29/1			
9/1				30/1			
12/1				2/2			
13/1				3/2			
14/1				4/2			
15/1				5/2			
16/1				6/2			
19/1				9/2			
20/1				10/2			
21/1				11/2			
22/1				12/2			
23/1				13/2			

*Knowledge Organiser * Whiteboard * Pencil Case

RUBBER

You should also have:

- Reading book
- Calculator
- Headphones
- Protractor
- Sharpener
- Compass
- (no scissors)



PENCIL

WHITEBOARD PEN

GREEN PEN

BLACK PEN

You should also have when needed:

- Ingredients
- PE kit
- Completed homework

RULER

You can borrow core items without penalty between 8.30-8.45am before passing your Head of Year