

KNOWLEDGE ORGANISER

YEAR 8 – TERM 4



**Think Like An
Environmentalist**

Community, Collaboration and Challenge

ATTENDANCE MATTERS



EVERY DAY COUNTS

Missing just 1 day every 2 weeks is the same as missing 10% of the school year.

LEARNING

Being in school allows you the best opportunity to learn.



WELLBEING

Attending school supports your mental and emotional health.

FUTURE SUCCESS

Regular attendance at school is vital for building the key skills needed for future employment



EQUIPMENT



School Bag



Knowledge
Organiser



Black and
Green Pens



Pencil case



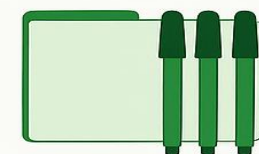
Calculator



Pencil



Rubber



Whiteboard
and whiteboard
pen



Highlighters



Ruler

SCHOOL DAY

9:00–9:05

AM Reg

9:05–10:20

Lesson 1

10:20–11:35

Lesson 2

11:35–12:05

Break 1

12:05–13:20

Lesson 3

13:20–13:50

Break 2

13:50–15:05

Lesson 4

15:05–15:30

PM Reg – assembly or
guided reading

Long date and learning goal (LG) on left and underlined.

Minimise errors

Use pencil or blue or black pen for all written work, ruler for straight lines.

Worksheets glued in straight, next to margin.

Feel proud

Single line through mistake. No scribbles.

Prepare for the future

Respond to feedback in green pen.

Easier to read and give better feedback

Thursday 7th September 2023

LG: To identify and use phrases that indicate the chronology of events.

Phrase	Meaning
At the beginning...	At the start of...
During...	While...
At the end...	At the finish of...

An autobiography is a biography written in first person. It contains your facts and opinions.

AS a young child I helped dad remove spiders from the garden shed. Some years later I studied biology. Having reached adulthood I moved Central America. Later in life I presented the programme Animal Legals and Dangerous.

I was born on May 9th 1995. At the age of 26 I signed a contract with Arsenal on 28th November 2021. A few years later I was part of the England football team that won the Euro 2020 tournament.

Monday 11th September 2023

LG: To identify and use phrases that indicate the chronology of events.

MUSIC NOTES:

Phrase	Meaning
At the beginning...	At the start of...
During...	While...
At the end...	At the finish of...

1. I started to play the piano when I was five. I was very good at it and I was very happy.

2. I was the first of my friends to play the piano. I was very happy.

3. The piano was the first thing I learned to play. I was very happy.

4. I was the first of my friends to play the piano. I was very happy.

5. I was the first of my friends to play the piano. I was very happy.

6. I was the first of my friends to play the piano. I was very happy.

7. I was the first of my friends to play the piano. I was very happy.

Numbered questions written in margin.

Always try your best to be neat (even when note taking).

Multiplication Grid

×	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

PERIODIC TABLE OF ELEMENTS

Chemical Group Block

PubChem																	
1																	18
1 1.0080 H Hydrogen Nonmetal																	2 4.00260 He Helium Noble Gas
3 7.0 Li Lithium Alkali Metal	4 9.012183 Be Beryllium Alkaline Earth Me...											5 10.81 B Boron Metalloid	6 12.011 C Carbon Nonmetal	7 14.007 N Nitrogen Nonmetal	8 15.999 O Oxygen Nonmetal	9 18.9984... F Fluorine Halogen	10 20.180 Ne Neon Noble Gas
11 22.989... Na Sodium Alkali Metal	12 24.305 Mg Magnesium Alkaline Earth Me...											13 26.981... Al Aluminum Post-Transition M...	14 28.085 Si Silicon Metalloid	15 30.973... P Phosphorus Nonmetal	16 32.07 S Sulfur Nonmetal	17 35.45 Cl Chlorine Halogen	18 39.9 Ar Argon Noble Gas
19 39.0983 K Potassium Alkali Metal	20 40.08 Ca Calcium Alkaline Earth Me...	21 44.95591 Sc Scandium Transition Metal	22 47.867 Ti Titanium Transition Metal	23 50.9415 V Vanadium Transition Metal	24 51.996 Cr Chromium Transition Metal	25 54.93804 Mn Manganese Transition Metal	26 55.84 Fe Iron Transition Metal	27 58.93319 Co Cobalt Transition Metal	28 58.693 Ni Nickel Transition Metal	29 63.55 Cu Copper Transition Metal	30 65.4 Zn Zinc Transition Metal	31 69.723 Ga Gallium Post-Transition M...	32 72.63 Ge Germanium Metalloid	33 74.92159 As Arsenic Metalloid	34 78.97 Se Selenium Nonmetal	35 79.90 Br Bromine Halogen	36 83.80 Kr Krypton Noble Gas
37 85.468 Rb Rubidium Alkali Metal	38 87.62 Sr Strontium Alkaline Earth Me...	39 88.90584 Y Yttrium Transition Metal	40 91.22 Zr Zirconium Transition Metal	41 92.90637 Nb Niobium Transition Metal	42 95.95 Mo Molybdenum Transition Metal	43 96.90636 Tc Technetium Transition Metal	44 101.1 Ru Ruthenium Transition Metal	45 102.9055 Rh Rhodium Transition Metal	46 106.42 Pd Palladium Transition Metal	47 107.868 Ag Silver Transition Metal	48 112.41 Cd Cadmium Transition Metal	49 114.818 In Indium Post-Transition M...	50 118.71 Sn Tin Post-Transition M...	51 121.760 Sb Antimony Metalloid	52 127.6 Te Tellurium Metalloid	53 126.9045 I Iodine Halogen	54 131.29 Xe Xenon Noble Gas
55 132.90... Cs Cesium Alkali Metal	56 137.33 Ba Barium Alkaline Earth Me...											81 204.383 Tl Thallium Post-Transition M...	82 207 Pb Lead Post-Transition M...	83 208.98... Bi Bismuth Post-Transition M...	84 208.98... Po Polonium Metalloid	85 209.98... At Astatine Halogen	86 222.01... Rn Radon Noble Gas
87 223.01... Fr Francium Alkali Metal	88 226.02... Ra Radium Alkaline Earth Me...											113 286.1... Nh Nihonium Post-Transition M...	114 290.1... Fl Flerovium Post-Transition M...	115 290.1... Mc Moscovium Post-Transition M...	116 293.2... Lv Livermorium Post-Transition M...	117 294.2... Ts Tennessine Halogen	118 295.2... Og Oganesson Noble Gas
		57 138.9055 La Lanthanum Lanthanide	58 140.116 Ce Cerium Lanthanide	59 140.90... Pr Praseodymium Lanthanide	60 144.24 Nd Neodymium Lanthanide	61 144.91... Pm Promethium Lanthanide	62 150.4 Sm Samarium Lanthanide	63 151.964 Eu Europium Lanthanide	64 157.2 Gd Gadolinium Lanthanide	65 158.92... Tb Terbium Lanthanide	66 162.500 Dy Dysprosium Lanthanide	67 164.93... Ho Holmium Lanthanide	68 167.26 Er Erbium Lanthanide	69 168.93... Tm Thulium Lanthanide	70 173.05 Yb Ytterbium Lanthanide	71 174.9668 Lu Lutetium Lanthanide	
		89 227.02... Ac Actinium Actinide	90 232.038 Th Thorium Actinide	91 231.03... Pa Protactinium Actinide	92 238.0289 U Uranium Actinide	93 237.04... Np Neptunium Actinide	94 244.06... Pu Plutonium Actinide	95 243.06... Am Americium Actinide	96 247.07... Cm Curium Actinide	97 247.07... Bk Berkelium Actinide	98 251.07... Cf Californium Actinide	99 252.0830 Es Einsteinium Actinide	100 257.0... Fm Fermium Actinide	101 258.0... Md Mendelevium Actinide	102 259.1... No Nobelium Actinide	103 266.1... Lr Lawrencium Actinide	

01 Adjectives

THAT DESCRIBE: <i>age:</i> young, old <i>colour:</i> red, blue <i>condition:</i> new, used <i>size:</i> large, medium <i>speed:</i> fast, slow <i>etc.</i>	COMPARATIVE: smaller, better...	SUPERLATIVE: the smallest, the worst, the best...
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08 Verbs

ACTION: to run, to organise, to read, to think... > Transitive or > Intransitive	LINKING: to be, to look, to appear, to seem, to smell...	HELPING (= AUXILIARY): can, may, will, must, should, to be, to have...
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07 Pronouns

PERSONAL (subject): I, you, he, she, it, we, you, they	DEMONSTRATIVE: this, these, that, those	INTERROGATIVE: how, where, when, which...?
PERSONAL (reflexive): myself, yourself, himself, herself, itself, ourselves, yourselves, themselves	PERSONAL (object): me, you, him, her, it, us, you, them	INDEFINITE: somebody, anyone...
	POSSESSIVE: mine, yours, his, hers, its, ours, yours, theirs	RELATIVE: that, which, whose, whom...

06 Prepositions

PLACE / DIRECTION: in, at, on, under, above, across, among, between...	TIME: in, at, on, over, until, about, during, before, after, while, through...	OTHER (agent, phrase...): by, with, on, over, to, up, within, beyond, for...
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05 Nouns

COMMON NOUNS: house, dog, laptop...			
PROPER NOUNS: (Capitalised) London, Paris, James, William, Julia, Jennifer...	> VERBAL: swimming...	> COLLECTIVE: choir, jury...	> COMPOUND: mother-in-law...
	> COUNTABLE: book, day...	> UNCOUNTABLE: traffic, calm...	> ABSTRACT V. CONCRETE: wit vs. road...

02 Adverbs

PLACE: here, there, outside, everywhere, upstairs, nowhere, somewhere...	TIME: ago, before, since, yet, for, still, afterwards...	MANNER: just, quite, quickly, hardly, well, carefully, barely, almost, scarcely, beautifully...
	FREQUENCY: often, never, sometimes, always	

03 Conjunctions

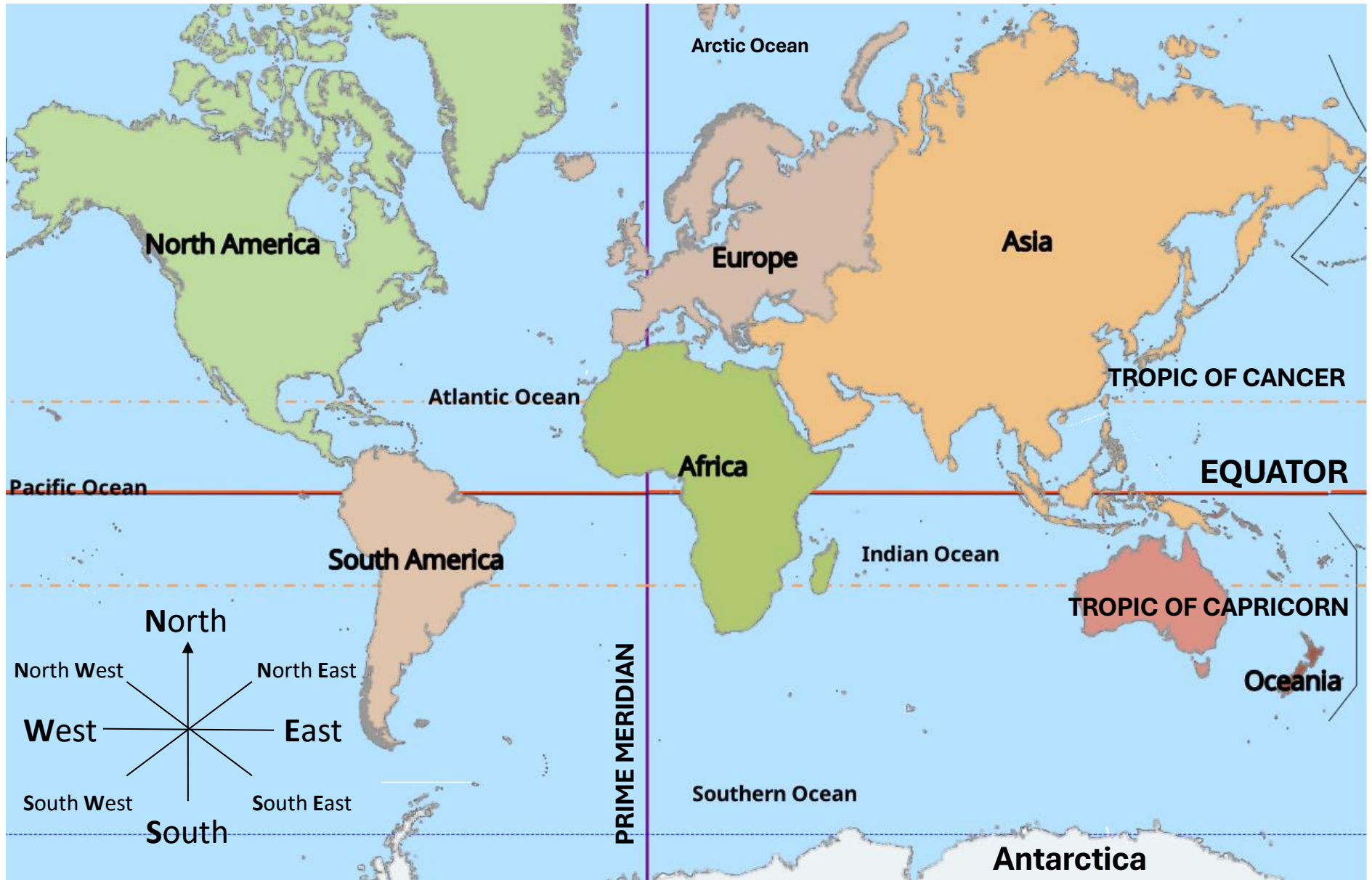
COORDINATING: and, or, but, yet, nor, for, so	CORRELATIVE: both... and..., either... or..., just as... so..., whether... or..., neither... nor..., not only... but also...	SUBORDINATING: after, since, if, while, although, before, because, unless
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04 Determiners

TELLS US WHICH: each, every, some, none, all...	TELLS US WHOSE: my, your, her, his, its, our, your, their (= possessive adjectives or determiners)
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World Map



Year 8 Sarah Graham

Art

Term 4

Artist Focus: Sarah Graham

Theme: Sweets and Photorealism

Mediums: Pencil, coloured pencils, acrylic paints

Skills: Observational drawing, colour mixing, tone and shading, painting techniques, composition



Introduction to Sarah Graham

- **Objective:** Introduce Sarah Graham and her work
- **Activities:**
 - Presentation on Sarah Graham's background and artwork
 - Class discussion: What makes her work unique?
 - Sketching activity: Copy a section of one of her sweet paintings
- **Homework:** Find a photo of a sweet (or bring a sweet wrapper) to use as inspiration

Observational Drawing

- **Objective:** Develop drawing from observation
- **Activities:**
 - Students draw from real sweets or wrappers
 - Focus on outline, form, and proportions
- **Skills:** Observational skills, pencil control

Shade drawings using pencil or fine liner

• Introduce tonal scale and reflective surfaces

• **Challenge:** Recreate shine and transparency in wrappers

Colour Theory & Application

- **Objective:** Understand and apply colour theory
- **Activities:**
 - Colour wheel review
 - Experiment with blending coloured pencils or acrylics
 - Begin colour studies of sweets
- **Focus:** Vibrant, saturated colours as seen in Graham's work
- Shade drawings using pencil or fine liner

Challenge: Recreate shine and transparency in wrappers

Composition and Planning

- **Objective:** Design final composition
- **Activities:**
 - Thumbnail sketches for layout
 - Decide arrangement of sweets
 - Discuss focal point, rule of thirds, and balance
 - Perspective, brush control, gouache



Painting Techniques

- **Objective:** Begin painting or colouring final piece
- **Activities:**
 - Demonstration: Acrylic blending, layering, highlights
 - Students begin colouring their final piece
- **Materials:** Acrylics, coloured pencils (depending on media choice)
- Brush control



Computing

Event Driven Programming

Data in event-driven programming, the flow of the program is controlled by events.

Events can be user actions such as:

- Mouse clicks (or the touchscreen equivalent)
- Key presses
- Hovering over a picture
- Voice input ("OK Google...")

Events can also be triggered by:

- Sensors (e.g. if movement is sensed, turn the light on)



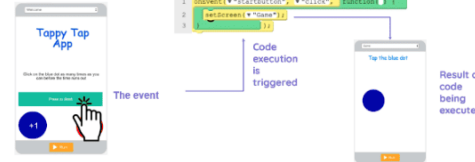
```
1 onEvent(▼"startbutton", ▼"click", function() {
2   setScreen(▼"Game");
3   setTimeout(function() {
4     setScreen(▼"Score");
5     , 5000);
6   });
```

Source: code.org

Graphical User Interface

The GUI (Graphical User Interface) is the screen that the user interacts with. It provides the interface between the user and the computer or program.

The Tappy Tap App will need three screens – Home screen, Game screen and Score screen.



Key Vocabulary

Key Word	Definition
Analysis	A thorough study doing a careful analysis of a problem.
Debug	The process of identifying and fixing errors in code.
Event handler	Used to determine when to collect data and what to do with it once it has been collected.
GUI	Graphical User Interface
Logic error	When the computer is able to run the program, but it does not work properly because the logic of the code is incorrect
Selection Statement	Used when there is more than one option for the user to select from. IF, ELSE, ELIF
Sub	Small blocks of code in a modular program designed to perform a particular task.
Routine	
Syntax error	When the computer does not understand the code because it has been typed incorrectly and doesn't follow the rules or grammar of the programming language.

Subroutines

Subroutines are **small blocks of code in a modular program designed to perform a particular task.**

getText("id") is a built-in subroutine that collects the text entered into a textbox; "id" is to be replaced with the name given to the text box.

```
var x = getText(▼"id");
```

Event handler

You can use an **event handler** to determine when to collect the data and what to do with it once it has been collected and linked with a variable.

```
onEvent(▼"login", ▼"click", function() {
  var username = getText(▼"username");
});
```



Debugging is the process of identifying and fixing errors in code. This is usually done as the code is being built, each new section of code will be tested as the program develops.

Syntax errors – When the computer doesn't understand the code because it has been typed incorrectly and doesn't follow the rules or grammar of the programming language.

Logic errors – When the computer is able to run the program, but it does not work properly because the logic of the code is incorrect. These sorts of errors are harder to spot and more difficult to debug and fix.

Selection

A selection statement is used when there are more than one option for a user to select from. It causes the program to make a choice and flow in a given direction. In these examples they used the statements if, else, else if.

Example

These two blocks of code have the same purpose, which is to provide feedback to the user at the end of a game.

Code block 1

```
if (score > 10) {
  setText(▼"feedback_label", "Great Work");
} else {
  setText(▼"feedback_label", "Hard Luck");
}
```

Code block 2

```
if (score > 10) {
  setText(▼"feedback_label", "Great Work");
} else if (score > 6) {
  setText(▼"feedback_label", "Not Bad");
} else {
  setText(▼"feedback_label", "Hard Luck");
}
```

Drama

Year 8

Drama

Term 4

Script Writing Techniques

Act One Scene 1 - This is the start of the play. An act is a way of dividing up a play (a bit like a chapter in a story book). An act can be made up of different scenes.

Scene - When you are writing a script, you start a new scene when the location, scenery or time changes.

Script - The script has information that tells everyone where the action takes place. It gives more detail about the scene and which characters are going to be in it:

Scene 3 - A cave in the middle of the desert.

A young boy called Aladdin is in a cave, surrounded by piles of treasure. Nearby there is a lamp.

Dialogue - When a character speaks in a play, we usually see their name in capitals. This is followed by the dialogue that the character is to say. Script writers can also get actors to perform the dialogue in a particular way. They do this by adding the direction in brackets:

ALADDIN: (*whispered*) I've found the magic lamp!

ALADDIN walks over to the lamp. He picks it up and rubs it. In a puff of smoke, a magical genie appears in front of him.

The script gives the director and actors all the words and instructions to tell a story in just the way the writer wishes.

Terminology

Genre - a style or category of art, music or literature

Dialogue - a conversation between two or more people as a feature of a book, play, or film.

Adaptation - changing from one genre to another

Silent Film - action without any words

Proxemics - the use of space between characters on a stage to communicate their relationships, status, and situation

Stimulus - a starting point or a source of inspiration.

Children's Theatre Techniques

Mime - the art of expressing ideas, emotions, and stories without using words.

Narration - the story told directly to the audience.

Sound effects - noises made to enhance the action.

Characterisation - the process an actor uses to develop a complete and believable character

Exaggeration - overstating or overemphasising a situation, emotion, or character for effect.

Adaptations to enjoy

Matilda (Book, play and film)

The Hunger Games (Book, play and film)

Under Milk Wood (radio, play and film)

My neighbour Totoro (film and play)

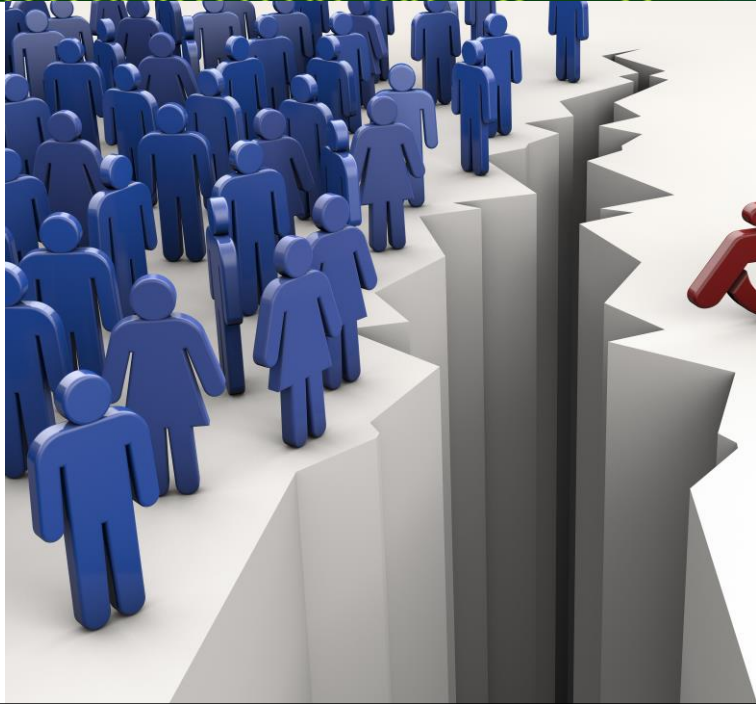
Adapting for Stage

English

	Technique	Explanation	Example
I	Imperatives	Commanding language to instruct or persuade.	"Act now!" / "Join us today!"
C	Connectives	Linking ideas to structure arguments clearly.	"Furthermore", "However", "In contrast"
D	Direct Address	Speaking directly to the reader/audience.	"You have the power to change this."
A	Alliteration	Repetition of initial sounds to create emphasis or rhythm.	"Big, bold, and brave decisions."
F	Facts	Using evidence or data to support your viewpoint.	"70% of students agree with this policy."
O	Opinions	Expressing personal beliefs or viewpoints.	"I strongly believe this is unfair."
R	Rhetorical Questions	Asking questions that don't need an answer to provoke thought.	"Is this really what we want for our future?"
E	Emotive Language	Words that stir emotions in the reader.	"Heartbreaking", "outrageous", "inspiring"
S	Statistics	Numerical data to support arguments.	"1 in 3 people are affected by this issue."
T	Triplets (Rule of Three)	Grouping ideas in threes for impact.	"Fair, fast, and effective."

Form	Key Features
Letter	Addresses, Date greeting, paragraphs, sign-off (e.g., Yours sincerely)
Article	Title, strapline, subheadings, overview paragraph
Leaflet	Title, bullet points, subheadings, sections
Speech	Address audience, rhetorical devices, sign-off
Essay	Introduction, body paragraphs, conclusion

Purpose	Example Task
Explain	"Explain what you think about..."
Argue	"Argue the case for or against..."
Persuade	"Persuade the writer that..."
Instruct/Advise	"Advise the reader on the best way to..."



Discrimination involves treating someone unfairly or less favourably due to protected characteristics—such as age, disability, race, sex, or religion—and is illegal under the Equality Act 2010. It manifests as direct, indirect, harassment, or victimisation, impacting areas like employment, housing, and services.

Stereotypes are overgeneralized, fixed, and often inaccurate beliefs or assumptions about specific groups of people, typically based on characteristics like race, gender, nationality, or age. They simplify complex information, allowing for quick, though often biased, judgments. While sometimes positive, stereotypes generally fuel prejudice, limit opportunities, and ignore individual differences.



French

Each week you will need to practise and learn your **Sentence of the Week** as well as your **Vocabulary of the Week**. For your **Vocabulary of the Week** also pay attention to which

Verbs are in **VIOLET**

Feminine nouns are in **PINK**

Masculine nouns are in **BLUE**

Adjectives are in **AMBER**

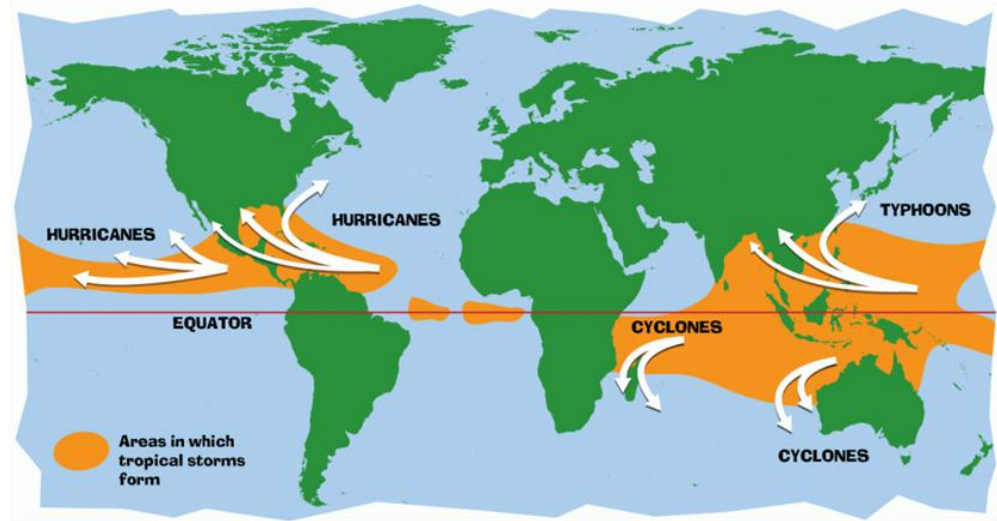
Week 5	J'ai un ami amusant. Il est chanteur.	I have a funny friend. He is a Singer.
Week 6	Le professeur est malade et la chanteuse est intelligente.	The teacher is ill and the singer (f) is intelligent.
Week 7	Il fait la cuisine mais elle fait les courses.	He does the cooking but she does the shopping.
Week 8	Je suis amusant comme mon ami.	I am funny, like my friend.
Week 9	Il fait beau et je fais une promenade.	The weather is good and I am going for a walk.

Week 6		Week 7		Week 8		Week 9		Week 10	
l'acteur (m)	actor (m)	faire	to do, make / doing, making	le poème	poem	le bateau	boat, ship	aimer	to like / liking
l'actrice (f)	actor (f)	je fais	I do / make	le poète	poet (m)	le magasin	shop	cocher	to tick / ticking
la fille	girl	tu fais	you do / make	la poète	poet (f)	le promenade	walk, ride	rester	to stay / staying
le garçon	boy	il fait	he does / makes	le ciel	sky	la visite	visit	passer	to spend / spending time
le médecin	doctor (m)	elle fait	she does / makes	le rêve	dream	le voyage	trip, journey	porter	to wear / wearing
la médecin	doctor (f)	ça	that	la vague	wave	le numéro	number	trouver	to find / finding
la personne	person	une activité	an activity	la couleur	colour	la question	question	un uniforme	a uniform
l'anglais (m)	English language	les courses	grocery shopping	bleu(e)	blue	la réponse	answer	l'école (f)	school
le français	French language	la cuisine	cooking	jaune	yellow	beau	beautiful (m)	le moment	moment
le	the (m)	les devoirs	homework	rouge	red	mauvais(e)	bad	la semaine	week
la	the (f)	le lit	bed	vert(e)	green	en	in/by	la solution	solution
les	the (pl)	le ménage	housework	comme	like	de	of	chaque	every
en	in	le modèle	model			Paris	Paris	à	to
le mot	word	Quoi?	What?			Londres	London	avec	with
la phrase	sentence								

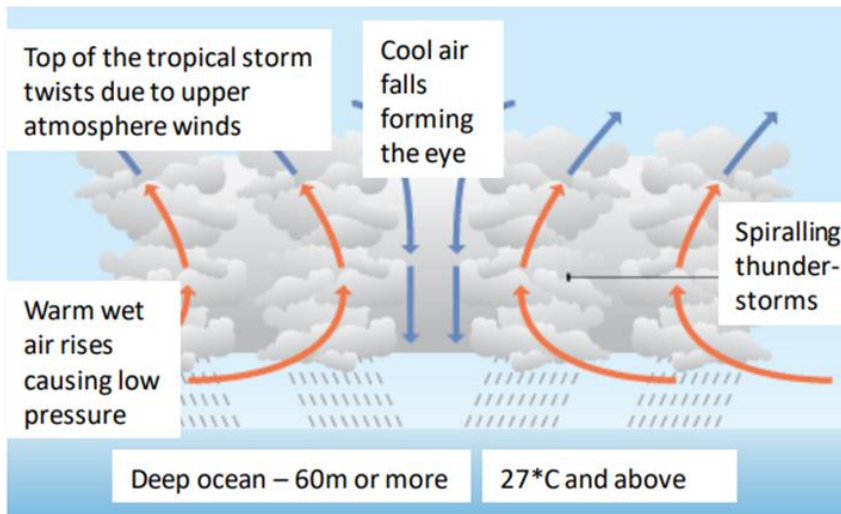
1. Tier 3 vocabulary to describe key concepts in extreme weather

Tier 3	Definition
Weather	describes the day-to-day conditions of the atmosphere. Weather can change quickly.
Climate	describes the average weather conditions over longer periods and larger areas. Climate is recorded & calculated over 30 years.
Extreme Weather	when a weather event is significantly different from the average weather conditions or usual weather pattern.
Mitigation	the action of reducing the severity, seriousness or painfulness of something.
Tropical Storm	a hazard that brings heavy rainfall, strong winds and other related hazards such as mudslides and floods
Tornado	a violently rotating column of air in contact with the ground

3. Map of areas where Tropical storms form & their local names



2. Formation of a Tropical Storm diagram



4. Extreme Weather event: Cyclone Phailin

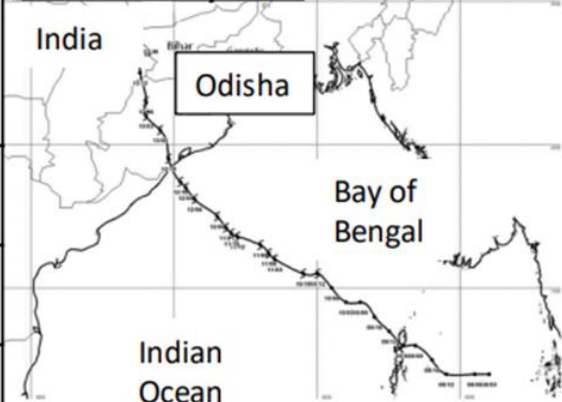
Made landfall in the **Odisha State** on **12th October 2013**. A **Category 5** storm which brought winds of **140mph**.

Social impacts: 47 deaths, 12million affected

Economic impacts: \$394 million of crop damage

Environmental impacts: 1,950 square miles flooded

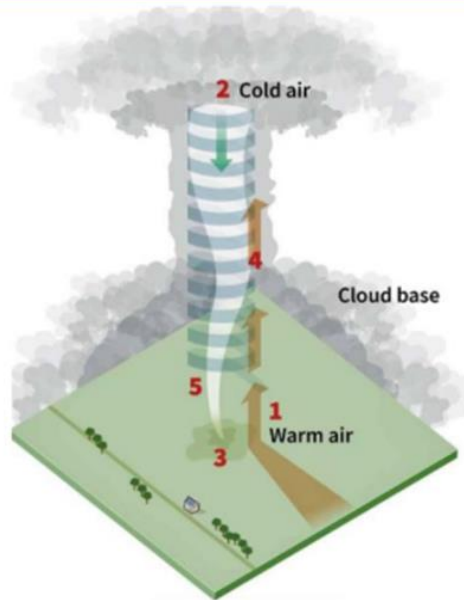
Track of the cyclone:



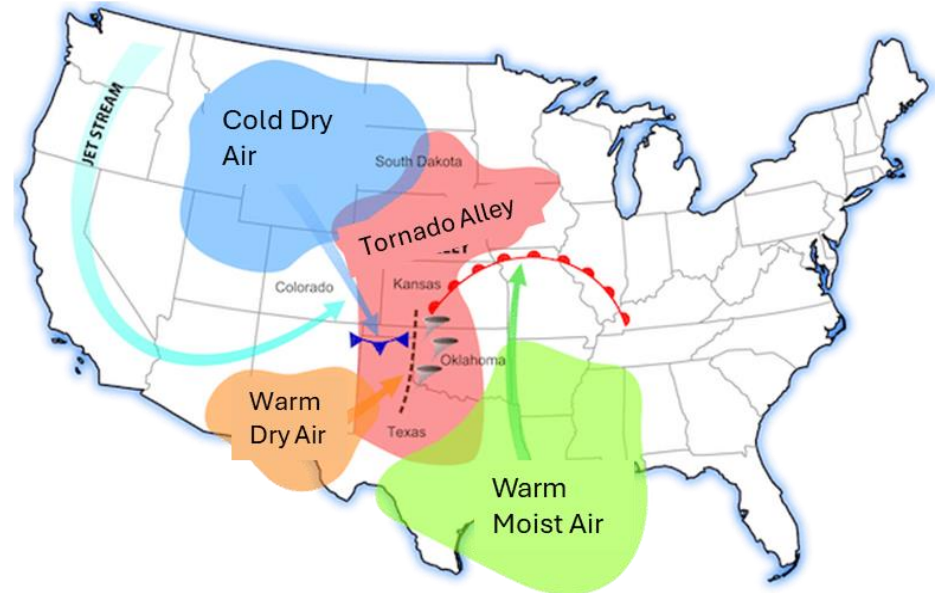
5. Formation of a Tornado diagram

Formation of a tornado

1. Warm, moist air rises from the ground
2. Warm air meets cold, dry air. A vortex is created, descending from a storm cloud.
3. Vortex contacts with the ground.
4. Updraft draws in more air, which rises upwards while rotating.
5. Tornado spins at speed creating a destructive force in it's path.



7. Tornado Alley – why tornadoes form here

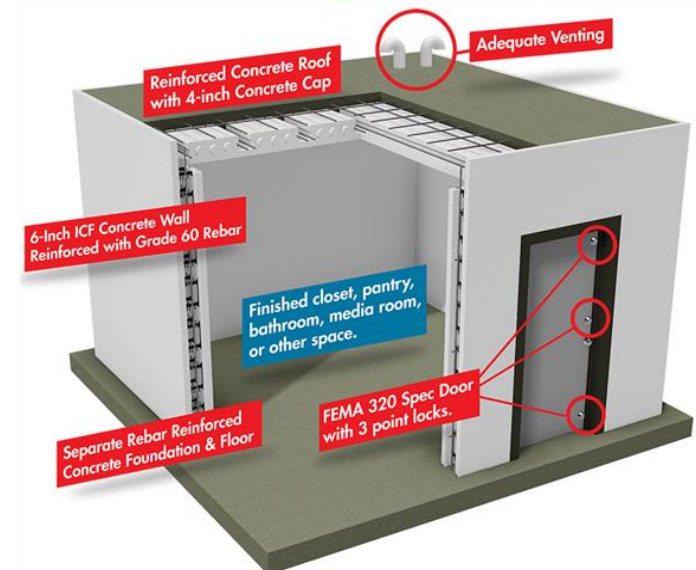


6. Oklahoma Safe Room Initiative Programme

On May 9, 2003, tornadoes swooped across Oklahoma City's "Tornado Alley." The tornadoes path was virtually the same as the one that struck 4 years prior. Oklahoma has historically been subject to destructive and deadly tornadoes and high winds. After the 1999 tornado, 44 persons died, 800 were injured and over 6,000 homes were damaged or destroyed.

Oklahoma was the first State to promote and implement a Statewide residential safe room initiative (Oklahoma Safe Room Initiative Program) to build safer communities. The safe room initiative was implemented by the State of Oklahoma with mitigation funds made available by FEMA through the Hazard Mitigation Grant Program (HMGP). This program funded the building of 6,016 safe rooms across the State.

There were no deaths in the 2003 tornado; the success directly attributable to the availability and utilization of the safe rooms. The Oklahomans in "Tornado Alley" felt safe and protected knowing that their families had a safe place to go.



Fractions & Percentages

What do I need to be able to do?

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

- Convert between FDP less than and more than 100
- Increase or decrease using multipliers
- Express an amount as a percentage
- Find percentage change

Keywords

Percent: parts per 100 — written using the % symbol

Decimal: a number in our base 10 number system. Numbers to the right of the decimal place are called decimals

Fraction: a fraction represents how many parts of a whole value you have.

Equivalent: of equal value

Reduce: to make smaller in value

Growth: to increase/ to grow

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

Invest: use money with the goal of it increasing in value over time (usually in a bank)

Convert FDP

70 out of 100

70 squares

70 'hundredths'

- 7 'tenths'

0.7

Using a calculator

S = D

Convert to a decimal

× 100 converts to a percentage

This will give you the answer in the simplest form

Convert FDP < and > 100%:

100 hundredths

10 tenths

100%

40 hundredths

4 tenths

40%

140 hundredths

14 tenths

140%

100% ÷ 40% = 1 ÷ 0.40 = 140

Fraction/ Percentage of amount

Find $\frac{3}{5}$ of £60

£60

£36

Remember

$\frac{3}{5} = 60\% = \frac{60}{100} = \frac{6}{10} = \frac{3}{5}$

10% of £60 = £6

50% of £60 = £30

60% of £60 = £36

Remember

$\frac{3}{5} = 60\% = \frac{60}{100} = \frac{6}{10} = \frac{3}{5}$

60% of £60 = £36

0.6 × 60 = £36

Remember

$\frac{3}{5} = 60\% = \frac{60}{100} = \frac{6}{10} = \frac{3}{5}$

60% of £60 = £36

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60% of £60 = £36

Percentage change

I bought a phone for £200

0.1 years later sold it for £125

100%

£200

£125

Percentage loss

$\frac{75}{200} \times 100 = 37.5\%$

200

0.1 values of change compare to the ORIGINAL value

Percentage profit

$\frac{36000}{180000} \times 100 = 20\%$

180000

Express as a % - Non-calculator

Percent — per hundred

7 per every 10 are orange

$\frac{7}{10}$

This means that 70 per every 100 are orange

$\frac{70}{100}$

70%

27 per every 50 shaded

$\frac{27}{50}$

54 per every 100 shaded

$\frac{54}{100}$

54%

Denominator 100

Equivalent fractions

Express as a % - Calculator

Percent — per hundred

13 out of 30

$\frac{13}{30}$

This is the same as

$\frac{13}{30}$

13 - 30

Can't use equivalence easily to find 'per hundred'

13 ÷ 30 = 0.43333... × 100 = 43.333...%

43.333...%

43%

Decimal percentages are still a percentage

Choose appropriate method

The language and wording of the question is the key

Have you represented the question in a bar model?

Can you use a calculator?

Standard Form

What do I need to be able to do?

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

- Write numbers in standard form and as ordinary numbers
- Order numbers in standard form
- Add/ Subtract with standard form
- Multiply/ Divide with standard form
- Use a calculator with standard form

Positive powers of 10

Trillion – 1 000 000 000

$$10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 = 10^9$$

Addition rule for indices $(10^2 \times 10^3 = 10^{2+3})$

Subtraction rule for indices $(10^2 \div 10^3 = 10^{2-3})$

Numbers between 0 and 1

0.054	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
$= 5.4 \times 10^{-2}$	10^0	10^{-1}	10^{-2}	10^{-3}
	0	0	5	4

A negative power does not mean a negative answer – it means a number closer to 0

Keywords

Standard (index) Form: A system of writing very big or very small numbers

Commutative: an operation is commutative if changing the order does not change the result

Base: The number that gets multiplied by a power

Power: The exponent – or the number that tells you how many times to use the number in multiplication

Exponent: The power – or the number that tells you how many times to use the number in multiplication

Indices: The power or the exponent

Negative: A value below zero

Standard form with numbers > 1

Any number between 1 and less than 10 $\rightarrow A \times 10^n$
 (Any integer less than 10)

Example

$$3.2 \times 10^4 \\ = 3.2 \times 10 \times 10 \times 10 \times 10 \\ = 32000$$

Non-example

$$0.8 \times 10^4 \\ 5.3 \times 10^{(7)}$$

Any value to the power 0 always = 1

Negative powers do not include negative solutions

Negative powers of 10

0.001	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
$1 \times \frac{1}{1000}$	10^0	10^{-1}	10^{-2}	10^{-3}
1×10^{-3}	0	0	0	1

Order numbers in standard form

6.4×10^{-2}	2.4×10^2	3.3×10^0	1.3×10^{-1}	10^2	10^1	10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}
0.064	240	1	0.13							

Look at the power first will the number be $>$ or $<$ than 1

Use a place value grid to compare the numbers for ordering

Mental calculations

$$6.4 \times 10^2 \times 1000$$

$$= 24 \times 10^5$$

$$= 6.4 \times 10^2 \times 10^3$$

$$= 6.4 \times 10^5$$

Use addition for indices rule

$$= 2.4 \times 10^1 \times 10^5$$

$$= 2.4 \times 10^6$$

Divide the values

$$(2 \times 10^2) \div 4$$

$$= (2 \div 4) \times 10^2$$

$$= 0.5 \times 10^2$$

Remember the input for standard form

Any number between 1 and less than 10 $\rightarrow A \times 10^n$
 (Any integer less than 10)

Multiplication and division

$$\frac{1.5 \times 10^5}{0.3 \times 10^3}$$

For multiplication and division you can look at the values for A and the powers of 10 as two separate calculations

$$(1.5 \times 10^5) \div (0.3 \times 10^3)$$

$$15 \div 0.3 \times 10^5 \div 10^3$$

$$= 5 \times 10^2$$

Calculator for indices

$$a^m \times a^n = a^{m+n}$$

Calculator for indices

$$a^m \div a^n = a^{m-n}$$

Addition and Subtraction

Tip: Convert into ordinary numbers first and back to standard form at the end

$$6 \times 10^5 + 8 \times 10^5$$

Method 1

$$= 600000 + 800000 \\ = 1400000 \\ = 1.4 \times 10^6$$

Method 2

$$= (6 + 8) \times 10^5 \\ = 14 \times 10^5 \\ = 1.4 \times 10^6$$

This is not the final answer

More robust method
Less room for misconceptions
Easier to do calculations with negative indices
Can use for different powers

Only works if the powers are the same

Using a calculator

Input 14 and press $\times 10^2$ Then press 5 (for the power)

Press $\square$

Input 3.9 and press $\times 10^2$ Then press 3 (for the power)

Press $\square$

Use a calculator to work out the question to a suitable degree of accuracy



This gives you the solution

Click calculator for video tutorial

To put into standard form and a suitable degree of accuracy

Press **SHIFT** **SETUP** and then press 7 for sci mode

Choose a degree of accuracy so in most cases press 2

Answer: 55×10^5

Maths

Weight = g kg t
Capacity (volume of liquid) = ml L

Digital Clock (24-hour times)

24-hour clock

- 0-11 (morning hours)
- 12-23 (afternoon hours)

THUR 8:00 PM

$$|100\rangle = |7\rangle$$

It is good to check all calculations with an estimate in all aspects of maths – it helps you identify calculation errors

Year 8

Music

Term 4

Year 8: Song writing - Melody.

The recipe for writing a song needs some useful musical components

- ✓ Melody (Vocal/instrumental) *
- ✓ Lyrics (Poetic structure & content) *
- ✓ Distinctive chord and melody combinations
- ✓ Recognisable basslines or instrumental riffs
- ✓ Unique rhythmic elements (if essential to the song's identity)
- ✓ Vocal harmonies.

* Normally considered essential

Using your keyboard or phone app

Compose a new melody

Make sure to write the notes, and the

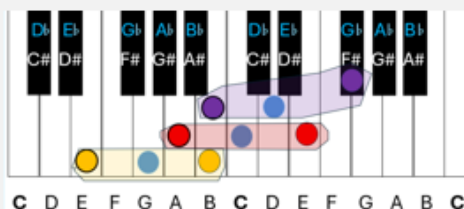
Correct fingering with hand shifts.

Challenge: Add some chords with your Left hand to harmonise with the melody.

Chords

Songs are based on chord progressions, which give the song its character.

Basic chords are **triads** which can be created anywhere on the keyboard by “play one, miss one, play one, miss one, play one”



Use your keyboard or phone app to play the chords shown, Em, Am & Bm

Chords of a key

Songs written in a ‘**key**’ have a set of chords that always sound good together. **They sound good in a key, because they are made from the scale of that key.**

Each scale has 7 unique notes & each note can form a chord by the play one, miss one, play one, miss one, play one rule.

Use your keyboard or phone app to find, play and write all of the chords of C Major.

Starts
C - CEG
Dm-DFA



Classic common chord patterns

Some 4 chord patterns are used countless times in many songs

Experiment with these ones at home on your phone app or keyboard.

C - G - Am - F (U2's with or with out you)

Am - F - C - G (The Cranberries' Zombie)

C - Am - G - F ('Axis of Awesome -)

Each of these progressions have been used by many other songs - so you can too.

Challenge: First write a couple of 4 chord sequences, then add a melody that fits in the right hand.

Song structures

To make songs catchy, they must be **predictable enough** so that our brains can enjoy the changes - but **different enough** so that we don't get **bored**.

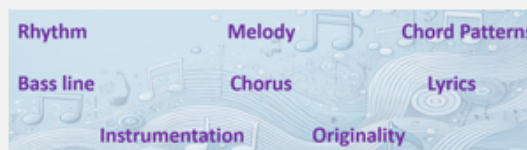


To do this, we use structures like **intro, verse, chorus, break and outro** - and then slightly change (for example) the chorus each time it comes around.

Use your keyboard or phone app to create 4 chords for verse and chorus sections

Challenge: Add a melody but make slight changes each time for each new chorus.

Copyright, royalties and rights.



When you own the **copyright** to a song (meaning it's yours) you can earn **royalties** from it being used in **films** etc.

To get copyright though, you only need to register the **lyrics** and **melody**.

Write why each of the other musical components shown are not copyrighted.

Challenge: Write your ideas on whether songs composed with AI should be copyrighted.

Year 8

Physical Education

Term 4

7

Jumps and Landings

Practice straight, tuck, and star jumps. Land with **bent knees, feet together**, and arms out for balance. Perform jumps from the floor or low equipment safely.



Gymnastics

8

Sequence and Performance

Combine **balances, travels, and jumps** into a short sequence. Work on **timing, flow, and presentation**. Evaluate your performance and others using **PE keywords** (e.g. control, extension).



Gymnastics

9

Throwing Technique

Use an **overarm throw** for power and accuracy. Step with the opposite foot, keep your elbow high, and follow through towards the target. Aim low at the opponent's legs or feet.



Dodgeball

10

Catching & Dodging

Catching eliminates the thrower and brings a teammate back. Focus on **two-handed catches** and absorb the ball's force. Dodge by moving side to side quickly or ducking.



Dodgeball

11

Movement and Positioning

Stay **light on your feet**, always watching for incoming throws. Use the court space wisely—move into safe areas and support teammates. **React quickly** to threats and opportunities.



Dodgeball

12

Game Rules & Team Tactics

Learn the key rules: **hit = out, catch = teammate in, headshots don't count**.

Develop team tactics like **targeting strong players, covering teammates**, and **timed attacks**.



Dodgeball

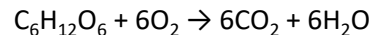
Keywords

Breathing	The inflation and deflation of the lungs by the contraction of the diaphragm and intercostal muscles.
Lung volume	Measure of the amount of air breathed in or out.
Respiration	Reaction which release energy from glucose.
Gas exchange	Process involving gases moving in and out of our blood.
Aerobic respiration	Breaking down glucose with oxygen to release energy and producing carbon dioxide and water.
Anaerobic respiration	Releasing energy from the breakdown of glucose without oxygen, producing lactic acid (in animals).
Fermentation	Yeast anaerobically respiring to produce ethanol and carbon dioxide.

Respiration

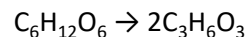
Aerobic respiration in animals & plants:

Glucose + oxygen → carbon dioxide + water



Anaerobic respiration in animals:

Glucose → lactic acid



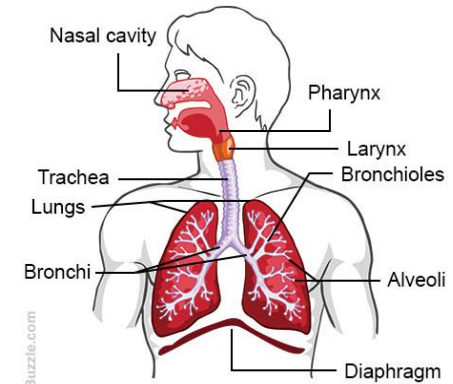
A poisonous waste product called lactic acid is produced, which can be removed by reacting it with oxygen:

Lactic acid + oxygen → carbon dioxide + water

Anaerobic respiration in yeast (fermentation):

Glucose → Ethanol + carbon dioxide

Structure of the Lungs



Trachea - Carries air from the mouth and nose to the lungs.

Bronchi - Two tubes which carry air to the lungs.

Bronchioles - Small tubes in the lung.

Alveoli - Small air sacs found at the end of each bronchiole.

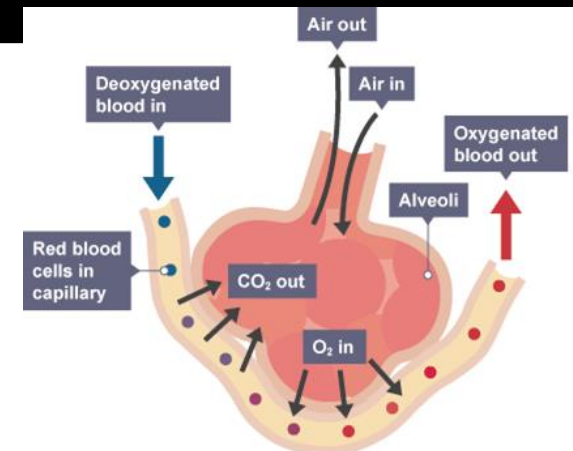
Diaphragm - A sheet of muscle found underneath the lungs.

Gas Exchange

Gas exchange takes place in the alveoli, the tiny air sacs at the end of the bronchioles.

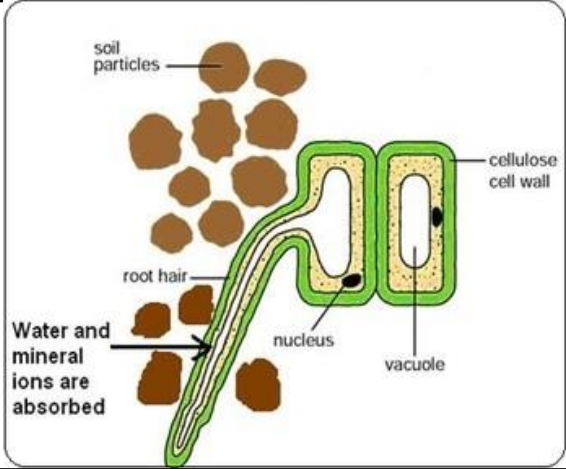
1. Oxygen molecules diffuse **from** the alveolus **into** the blood in the capillary, moving from higher to lower concentration.

2. Carbon dioxide molecules diffuse **from** the blood in the capillary **into** the alveolus, moving from higher to lower concentration.



Science

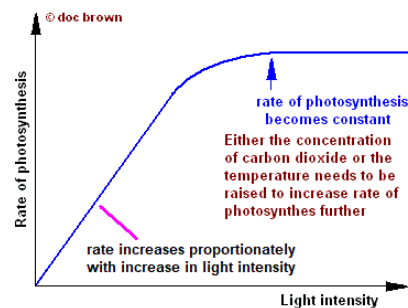
Photosynthesis

Keyword	Definition	How do plants use glucose?	Root structure showing root hair cell
Photosynthesis	The chemical reaction by which plants make glucose using light, carbon dioxide and water	Respiration Production of large molecules: • Starch • Proteins • Oils and fats Roles of roots • Stability of plant • Absorb water • Absorb minerals	
Xylem	Tissue that carries water from the roots to the leaves		
Phloem	Tissue that carries dissolved sugars around the plant		
Transpiration	The loss of water vapour through pores in the leaf		
Transpiration stream	Movement of water through roots and xylem to the leaves		
Reactants	Chemicals required for a chemical reaction	$\text{Water} + \text{carbon dioxide} \xrightarrow[\text{chlorophyll}]{\text{light}} \text{oxygen} + \text{glucose}$	
Product	Chemicals produced in a chemical reaction		

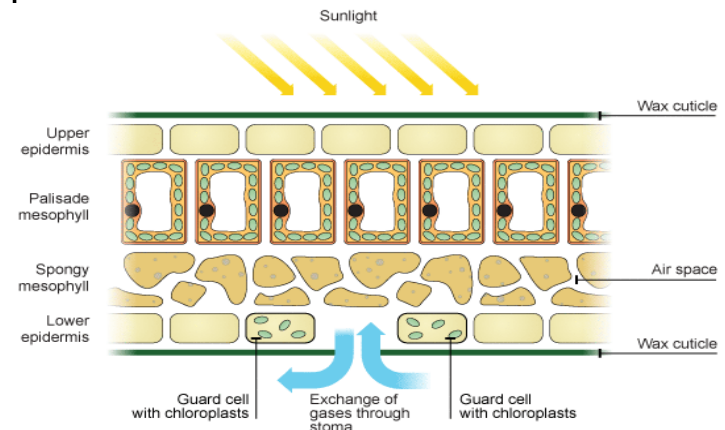
Part of Plant	Adaptations
Roots	Root hair cells to increase surface area for absorption of water
Stem	Tube like xylem to carry water Tube like phloem to carry dissolved sugars
Leaf - Epidermis/cuticle	Reduces water loss and prevents the entry of pathogens
Leaf - Palisade mesophyll	Regular shaped cells with large numbers of chloroplasts to increase the rate of photosynthesis
Leaf - Spongy mesophyll	Provides air gaps to allow gas exchange (oxygen out, carbon dioxide in)
Leaf - Guard cells	Allow pores (stoma) to be opened and closed to control water loss

Factors affecting the rate of photosynthesis:

Light intensity
 Colour of light
 Carbon dioxide concentration
 Availability of water
 Temperature
 Number and size of leaves



Cross section of a leaf:



Keywords

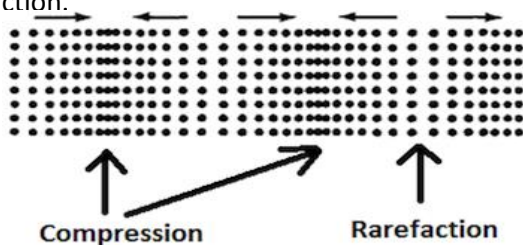
Vibration	A back and forth repeating motion.
Vacuum	A space with no particles of matter in it.
Oscilloscope	Device for viewing patterns of sound waves that have been turned into electrical current.
Absorption	When energy is transferred from sound to a material.
Echo	Reflection of sound waves from a surface back to the listener.

Waves

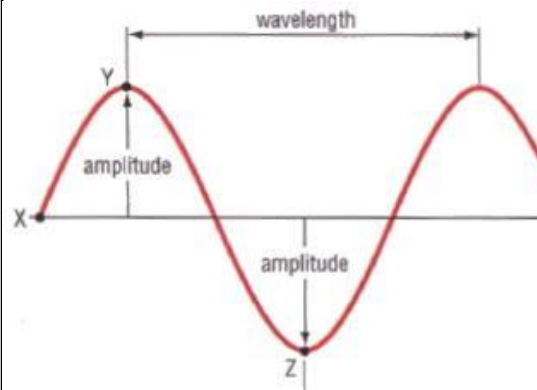
Waves can travel in two ways:

1. Longitudinal waves travel in straight lines - where the direction of vibration is the same as that of the wave.
2. Transverse waves move at right angles to the direction of the wave.

Sound waves are longitudinal waves. They involve particles and have areas of compression and rarefaction.



Wave Characteristics



Wavelength

The distance from a point on one wave to the same point on the next wave.
Measured in metres and has the symbol λ (Greek letter lambda).
A shorter wavelength = higher frequency.

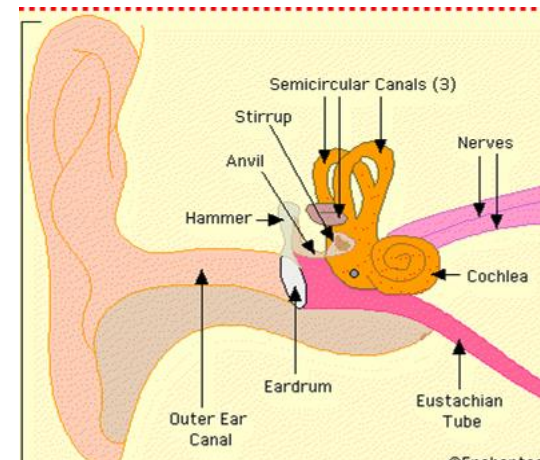
Frequency

The number of waves passing a point every second and is measured in hertz (Hz).
A higher frequency means a high pitch.

Amplitude

The height of the wave from the centre line to a peak or trough.
Measured in metres.
The more energy a wave has the bigger the amplitude and the louder the sound.

The Ear & Hearing



1. Your outer ear channels sound waves into your ear.
2. The sound waves travel along the auditory canal.
3. The ear-drum vibrates when a sound hits it.
4. The vibrating ear-drum makes the little bones in your ear vibrate.
5. The vibrations pass along the auditory nerve your brain.
6. Your brain sorts the messages and you hear the sound.

Hearing loss could be caused by:

Wax blocking the ear

Loud noises tearing eardrum

Ear infection

Small bones in the ear can get stuck together

Loud noises can damage the cochlea

Keywords

Normal line	A line drawn at right angles to the surface where the ray hits. Angles are measured from this line.
Absorption	Light is transferred to a material and is not reflected or transmitted.
Transmitted	Light that passes through an object is transmitted.
Scattering	When light bounces off an object in all directions.
Transparent	An object that allows light through without scattering.
Translucent	An object that allows light through with scattering.
Opaque	An object that allows no light through.

Reflection

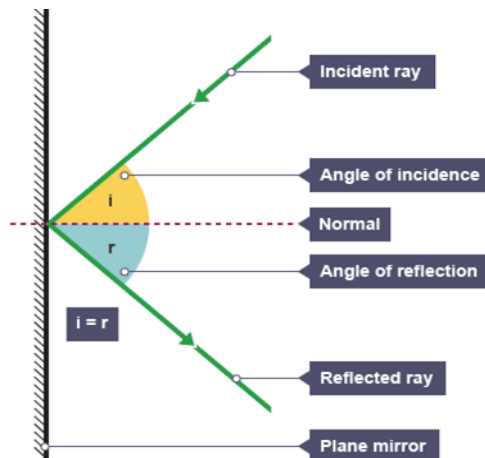
When light is reflected it bounces off of something.

We use ray diagrams to draw reflections.

To help us with our ray diagram, we can draw a line 90° to the reflective material.

This line is called the normal.

Angle of incidence = angle of reflection.



Calculating wave speed

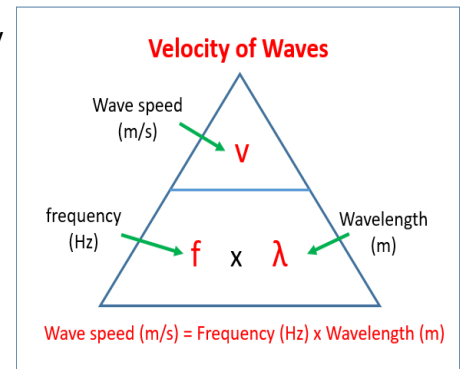
Speed = wavelength x frequency
(m/s) (m) (Hz)

Symbol equation: $v = f \times \lambda$

Equation rearranged:

Wavelength = Speed / frequency

Frequency = Speed / wavelength

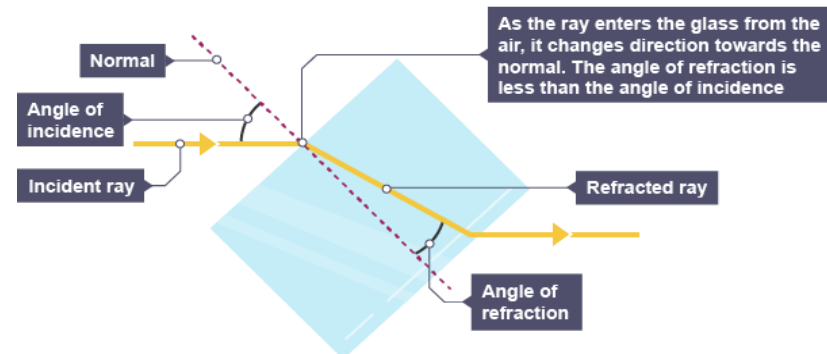


Refraction

Waves are refracted when they change speed.

When waves slow down they bend towards the normal line. This happens when light travels from air to glass.

When waves speeds up they bend away from the normal line. This happens when light travels from glass to air.



The angle of refraction is less than the angle of incidence.