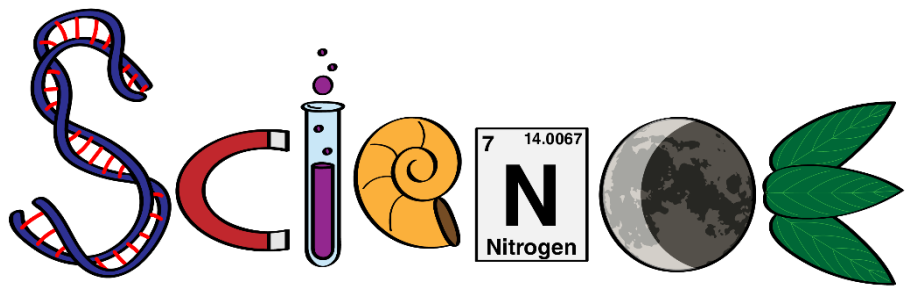
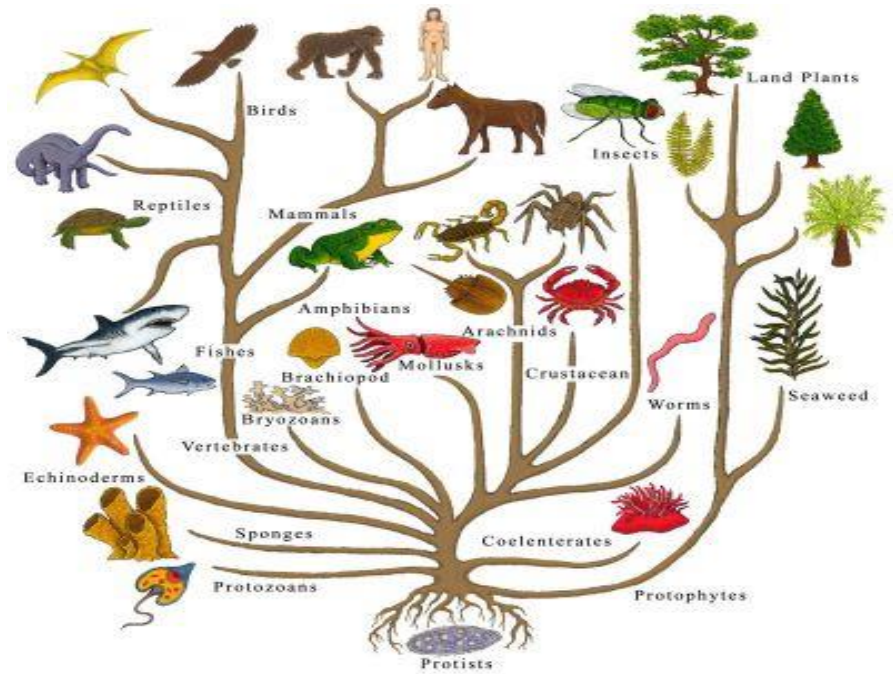


S2



Topic 2-1 Living planet



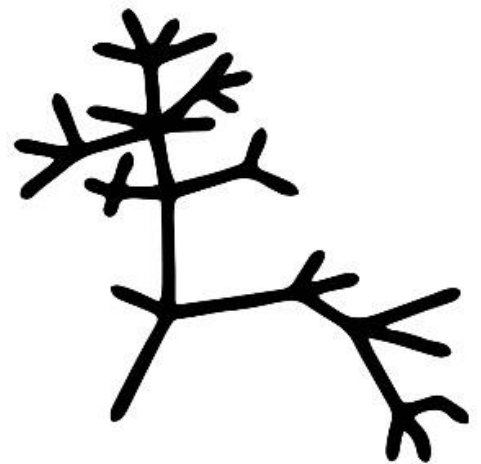
Name: _____

Form Class: _____

Science Teacher: _____

Contents:

Success criteria	pages 2 - 3
Summary notes	pages 4 -8
Key skills checklist	pages 9 - 13
Homework	pages 14 - 15
Useful Websites	page 16



Success Criteria

Level	Success Criteria - Check your progress...	✓
2	<i>List</i> the seven key features of all living things	
2	<i>Identify</i> the five vertebrate groups	
2	<i>Describe</i> the features of each vertebrate group	
2	<i>Name</i> the 5 main invertebrate groups	
2	<i>Name</i> the 4 different types of arthropod	
2	<i>Give examples</i> of each type of invertebrate	
2	<i>Identify</i> common invertebrates using an identification key	
2	<i>State</i> three factors that plants needs to grow	
2	<i>State</i> two substances that plants make in photosynthesis	
2	<i>State</i> what makes leaves green	
2	<i>Collect</i> results in a clear and detailed table	
2	<i>List</i> key features of each plant group	
2	<i>State</i> the factors for which plants compete	
2	<i>State</i> what the arrows in a food chain represent	

Level	Success Criteria - Check your progress...	✓
3	<i>Explain why</i> non-living objects, such as cars and fire, are not considered as being alive	
3	<i>Create</i> an experiment to test if seeds need light to germinate	
3	<i>Describe</i> the key features of each type of invertebrate	
3	<i>Create</i> an interesting Powerpoint to teach P6 students about invertebrates	
3	Use a tally chart and bar graph to <i>compare</i> the frequency of different animals in a leaf litter	
3	<i>Describe</i> the process of photosynthesis (equation)	
3	<i>Explain why</i> water plants give off bubbles in light	
3	<i>Describe</i> the effect of increasing light levels on photosynthesis	
3	<i>Describe</i> how plants are useful	
3	<i>Describe</i> how to sample plant abundance in an area	
3	<i>Describe how</i> organisms in a food web depend upon each other	
3	<i>Explain why</i> plants are called producers.	
3	<i>Create</i> food webs by joining different food chains	

Summary Notes

What does it mean to be alive?

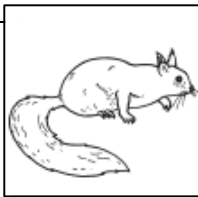
- All living things have 7 features
 - **Movement** - body goes to new places
 - **Respiration** - break down sugar for energy
 - **Senses** - aware and respond to surroundings
 - **Grow** - start small and get bigger
 - **Reproduce** - make new living things
 - **Excretion** - Get rid of waste
 - **Nutrition** - Take in food
- Some living things, such as seeds, delay showing these features



Vertebrates - have some backbone

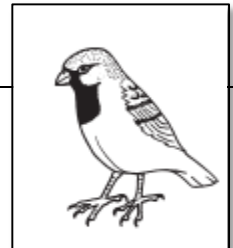
Mammals

- Have hair or fur
- Feed young on milk
- Young grow inside mother



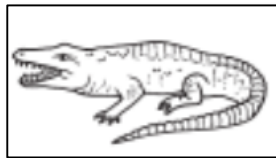
Birds

- Feathers & wings
- Most can fly
- Lay eggs with hard shells



Reptiles

- Have dry, scaly skin
- Lay eggs with soft shells



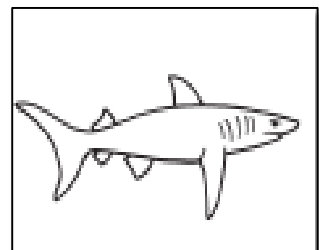
Amphibians

- Smooth moist skin
- Lay eggs with no shells in water



Fish

- Live in water all of the time
- Swim using fins
- Use gills to absorb oxygen from water (not breathing!)
- Scaly skin



Invertebrates - Bugs, slugs, worms & blobs

Jelly fish

- Jelly-like bodies
- No head
- Stinging tentacles



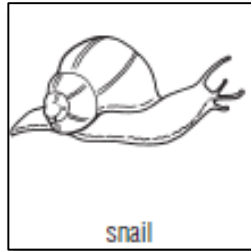
Worms

- Long bodies, no legs
- Flat, Round, or Segmented body



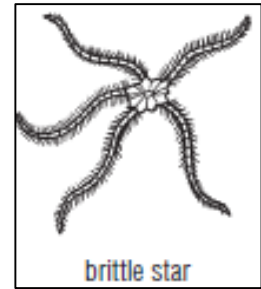
Molluscs

- Soft-body with head
- Tentacles
- Some have hard shells



Starfish

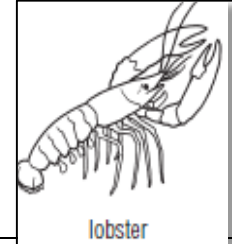
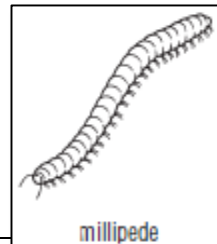
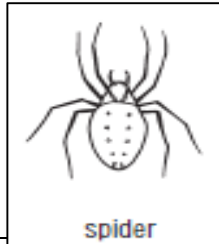
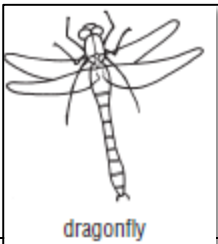
- 5 arms
- Central mouth
- Spines



Arthropods (jointed legs)

All have hard outer skeleton

- Insects - 6 legs, 3 body parts, most have wings
- Arachnids - 8 legs, 2 body parts, no wings
- Centipedes - long body with many legs
- Crustaceans - Very hard outer skeleton, most live in water



Bug hunt!

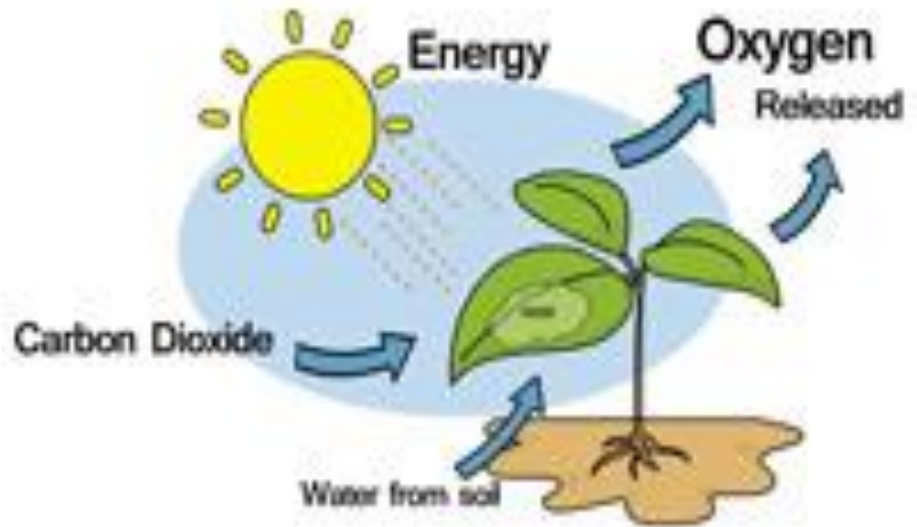
- Pooters are special containers that can be used to suck up small invertebrates safely
- Sampling means measuring a small part of something and using this to make predictions about the rest
- Repeating samples and combining results can give you more reliable data

Plants - solar-powered sugar factories

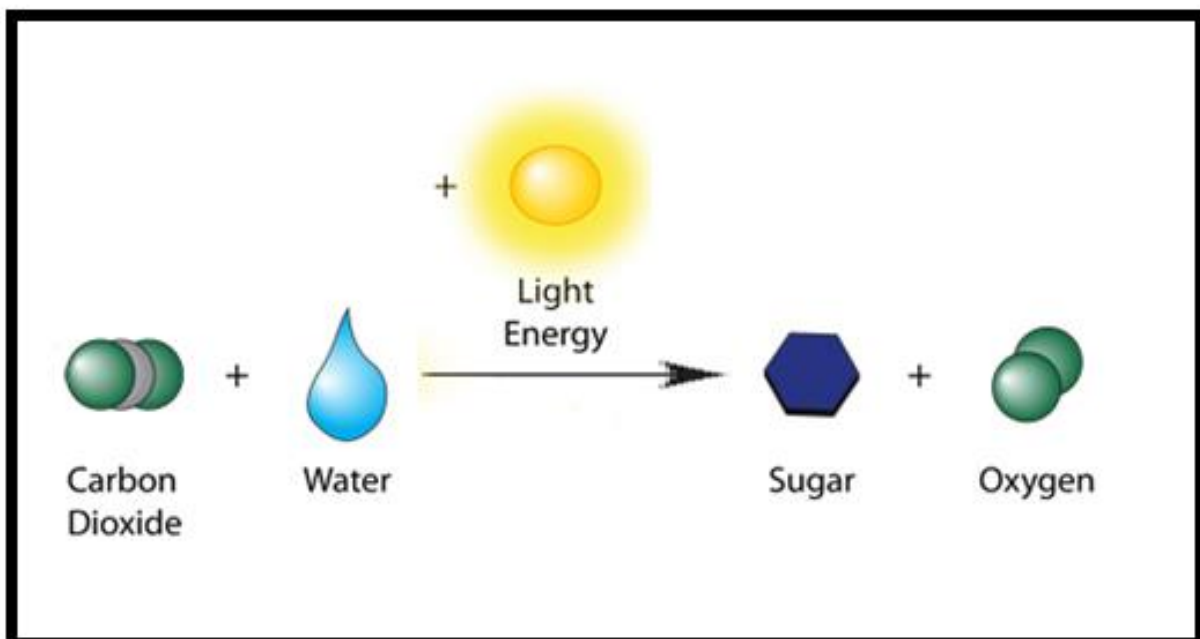
- Plants can make their own sugar through a chemical reaction called **photosynthesis**

- **Photo** (*light*)-**synthesis**
(*to make something*)

- Plants take in water from the soil and carbon dioxide from the air.

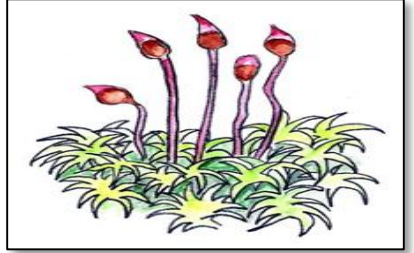


- Light energy is used to change these two chemicals into sugar
- The reaction also creates oxygen (waste gas)
- Leaves contain a green substance called chlorophyll that traps light energy
- Photosynthesis can be summarised with the equation:



What have plants ever done for us?

- Plants are not just important for giving us food and oxygen. They also have a huge number of different uses for our everyday lives.
- Plants can be split into four main groups:

Group	Features	Diagram
Mosses	Small plants that grow in clumps, tiny roots and leaves, restricted to damp areas, reproduce with spores not seeds	
Ferns	Flowerless plants with strong stems and leaves that uncurl from a central base, reproduce with spores not seeds	
Conifer	Evergreen plants. Usually have small needle-like leaves, no flowers, seeds produced in cones	
Flowering plants	Large variety of different plants including broad leaf trees, flowers and grasses. All have flowers and seeds.	

Uses of plants include:

- Food
- Building material - Timber
- Paper
- Fibres - Rope, cotton
- Medicine - Antiseptics, painkillers
- Chemicals - Cosmetics, biofuel

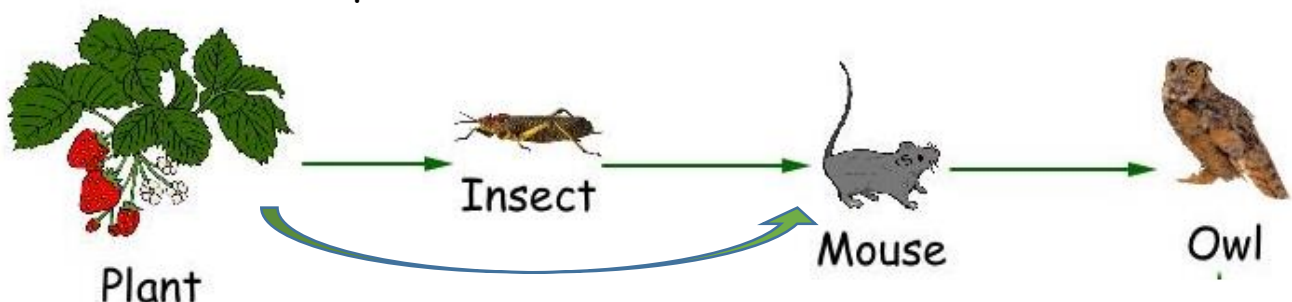
War of the plants

- Plants compete for light and water in the soil
- Some plants outcompete others by growing faster
- A Quadrat is a tool used in sampling plants. It marks off an exact area so that a small sample of plants can be identified and counted.
- Quadrats should be placed **randomly** so that a representative sample is taken.
- Abundance is a measure of the number of plants in an area.

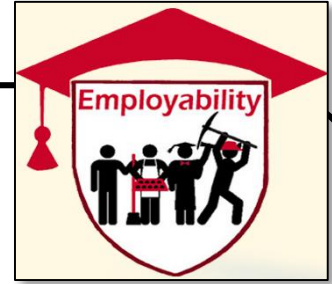


Food chains show energy flow

- All living things ultimately get energy from the sun.
- Plants are called **producers** because they produce their own food. Plants convert light energy into chemical energy in sugar, using photosynthesis. **All food chains start with a plant.**
- Animals are called **consumers** because they get their energy from eating other living things.
- **Herbivores** get their energy from eating only plants
- **Carnivores** get their energy from eating only animals
- **Omnivores** eat plants and animals



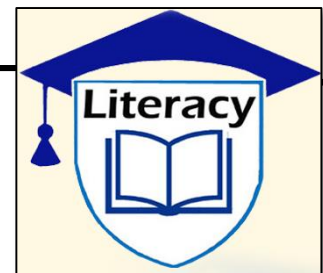
Key Skills - Checklists for success:



Team work - Get a team identity

Success Criteria:

- ☐ Break the ice - Share some information about yourself
 - What is your favourite food?
 - What is your favourite colour?
 - What is your favourite animal?
 - What is your dream job?
- ☐ Work together to make a team name and logo that includes at least one suggestion from each team member



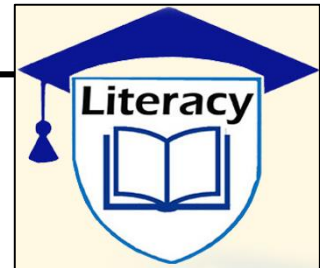
How to scan and summarise information

Success Criteria:

- ☐ Before reading, decide which questions you would like answered. Give your reading a clear purpose.
- ☐ Use your questions to create a summary table before you start reading
- ☐ Identify the keywords you need to find
- ☐ Don't read every word - look for key words.
- ☐ Highlight just 1-3 keywords per sentence or paragraph (see example on next page)



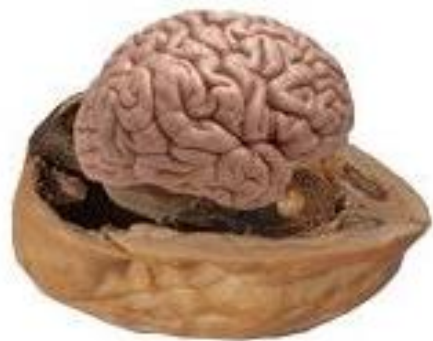
Another type of mammal we saw was the monkeys. A mother monkey was feeding her baby with body milk. In a different part of the zoo we also saw seals. I was surprised to learn that seals were also mammals because they have small hairs on their skin and their babies grow inside them.



How to research and present findings

Success Criteria:

- ☐ Create a set of questions to give your research a clear purpose
- ☐ Practise **Read, Tell, Nutshell** to summarise in your own words
 - **Read:** Read a paragraph
 - **Tell:** Cover and tell someone about what you have just read
 - **Nutshell:** Pick out 1-3 keywords and make a new sentence
- ☐ Plan the lay out of your poster before starting
- ☐ Use clear headings for each section e.g. questions
- ☐ Use diagrams to give a give picture of key ideas.
- ☐ Have someone check that you have answered all the research questions (success criteria sheet)
- ☐ Include the clear and reliable sources you used

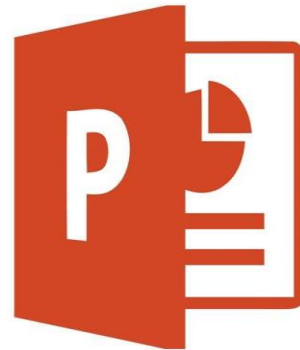


How to create a clear Powerpoint



Success Criteria:

- ☐ Choose a text colour than can easily be read against the background e.g. blue on white, yellow on black
- ☐ Choose a plain simple background to avoid distractions
- ☐ Font size at least 28
- ☐ Aim for no more than 20-30 words per slide
- ☐ Include a picture or image that summarises the text
- ☐ Use Bold font for headings
- ☐ Use bullet points for lists (no more than 3-4 points)
- ☐ Avoid wasting time playing with different fonts
- ☐ Avoid text animations - they can be distracting



Molluscs

Examples include:

- Slugs & snails
- Octopi & squid
- Clams & oysters



All molluscs have a:

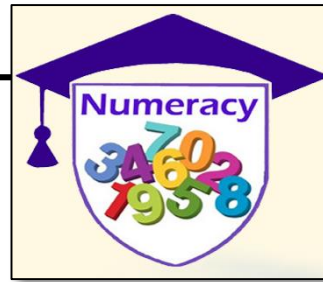
- Soft-body with head
- Tentacles
- Some have hard shells



Did you know?

The largest mollusc is the giant squid
It can grow up to 27m long.

<http://www.bbc.co.uk/earth/story/20160524-the-27-metre-long-giant-sea-monster>



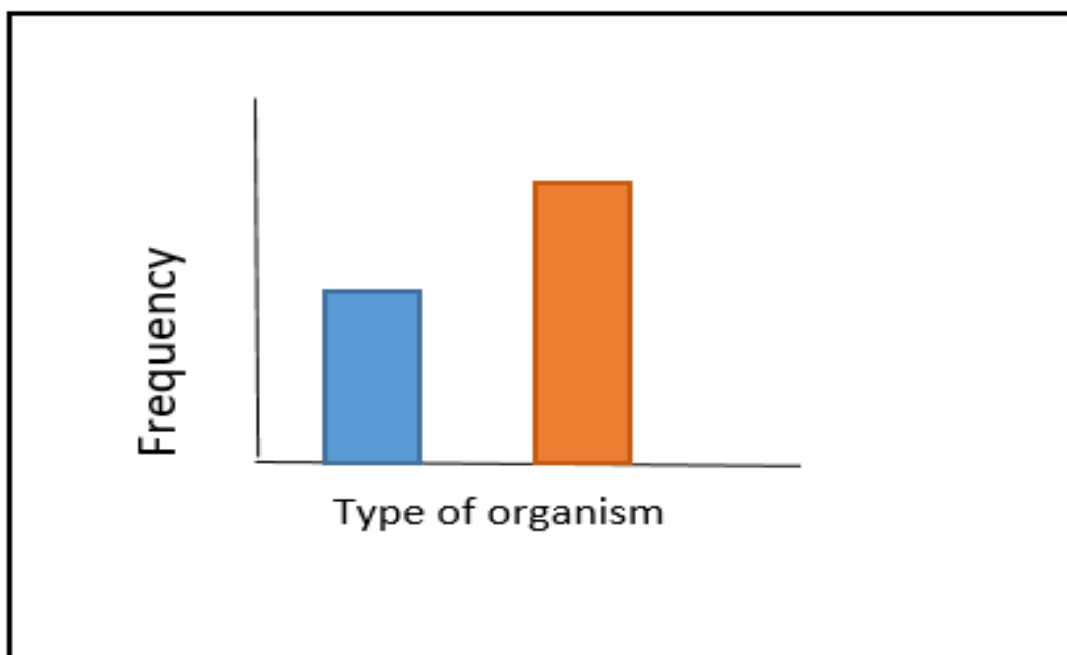
How to use a tally chart & bar graph

Success Criteria:

- ☐ Create a tally table e.g.

Type of organism	Tally	Frequency
Beetles	II	7
Woodlouse		13

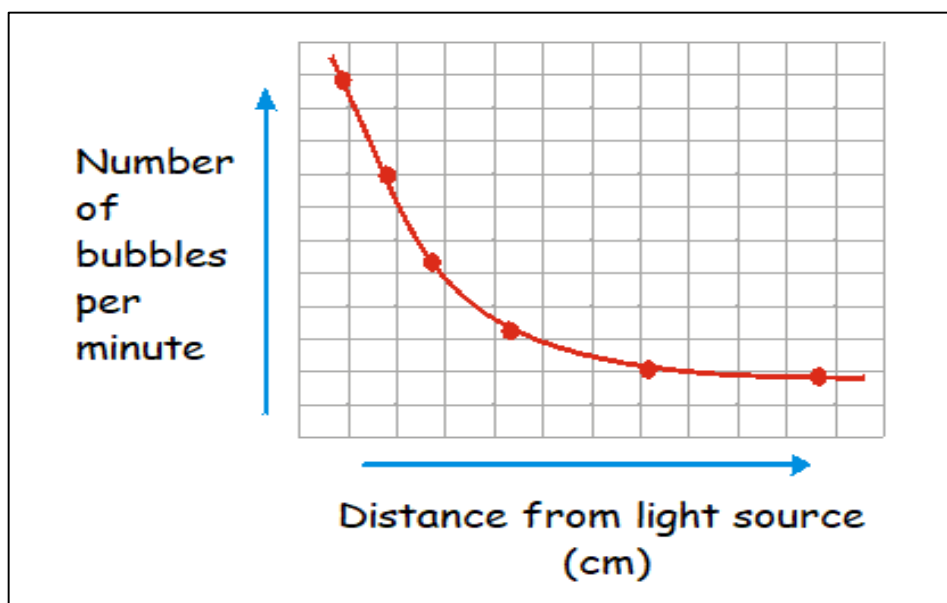
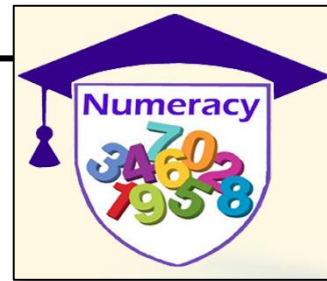
- ☐ Each time a type of animal is found, add a tally mark to the table (4 marks then strike through at 5)
- ☐ Add new organisms to the list as they are found.
- ☐ Share results with other groups to create a more reliable class tally chart
- ☐ Plot your data as a bar graph



Presenting data as a line graph

Success Criteria:

- ☐ Use a **line graph** for data that gradually changes
- ☐ Use **P.A.L.U.S.** - **In the door and up the stairs**
 - **P = Pencil & Ruler:** Keep it neat and easy to correct
 - **A = Axes:** Plot what you change on the x-axis and the results you recorded on the y-axis
 - **L = Labels:** Copy your table headings
 - **U = Units:** Copy units from table
 - **S = Scale:** Go up in even spaces
e.g. 5, 10, 15
- ☐ **In the door and up the stairs:** Read along the x-axis and then up the y-axis



Homework 1: Research Scottish wildlife

Use the website below to find out more about the creatures that live in the **wilds** of Scotland (no pets or farm animals!)

<https://scottishwildlifetrust.org.uk/scotlands-wildlife/species-finder/>



Types of animal & plant		2 examples of Scottish <u>wildlife</u>
Vertebrates	Mammal	
	Birds	
	Reptiles	
	Amphibians	
	Fish	
Invertebrate	Insect	
	Crustacean	
	Molluscs or worms	
Plants	Flowering plant	
	Conifer	
	Fern or moss	

Homework 2: Numeracy skills practise

Students used quadrats to investigate the frequency of ground plants in a forest.

They compared the number of different ground plants in an **open** area to the number found in the **shade** under a tree.

Quadrat	1	2	3	Average
Number of ground plants in open area	8	14	10	
Number of ground plants under tree	3	1	5	

Questions

1. Calculate the average number of ground plants in each area and complete the table

Calculating averages:
Step 1: Find the total
Step 2: Divide total by
how many numbers added

2. Present the **average** results as a **bar graph**

- a. Area on bottom axis e.g. Open area Under tree
- b. Average number of plants on side axis
- c. Use a scale that goes up in 2s

3. Draw conclusions:

- a. Describe the pattern: which area had more plants?
- b. Explain the pattern: suggest a reason why there was a difference in the number of plants

Interesting websites:

'Crash course biology'



Chordates (vertebrates)

<https://www.youtube.com/watch?v=kgZRZmEc9j4>

Simple Animals: Sponges, Jellies, & Octopuses

<https://www.youtube.com/watch?v=tIfsHPpkSPs>

Complex Animals: Annelids & Arthropods

<https://www.youtube.com/watch?v=YQb7Xq0enTI>

What Makes Us Animals

<https://www.youtube.com/watch?v=7ABSjKS0hic>

Vascular Plants = Winning!

<https://www.youtube.com/watch?v=h9oDTMXM7M8>