

Geography Fieldwork at Birmingham Botanical Gardens



Key Stages 3 & 4

THE BIRMINGHAM
BOTANICAL
GARDENS
TURN OVER A NEW LEAF

Introduction

These worksheets have been designed so that you can select from them in order to create your own booklet, tailored to your requirements and the abilities of your students. It is not expected that you use all of the worksheets.

Some of the worksheets describe the same task but are designed to be more or less demanding. This can help with differentiation.

Name: _____

Class: _____



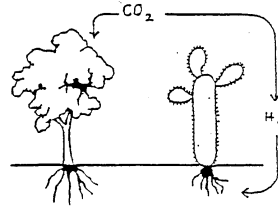
Fieldwork
At
Birmingham Botanical Gardens

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The Value of Plants

Cultural

Recognition of plants in our lives reflected through religion, festivals and storytelling.



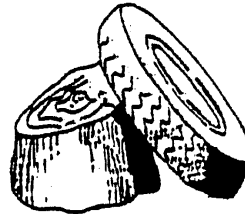
Life Support

Plants provide oxygen, protect soils and regulate water

cycles in all environments from dry desert to wetlands.

Habitat

Plants can provide living spaces for many species of animals as well as other plants.



Raw Materials

Plants provide us with industrial /manufacturing materials and chemicals.

Decorative

Beautiful plants enhance our lives.

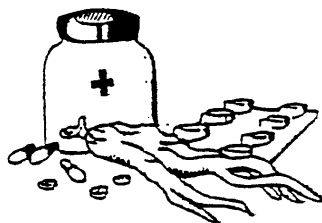
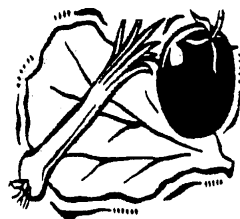


Genetic Store

Cultivated varieties can be improved by breeding with wild varieties.

Food

Plants provide many different foods for humans as well as for other animals.



Medicines

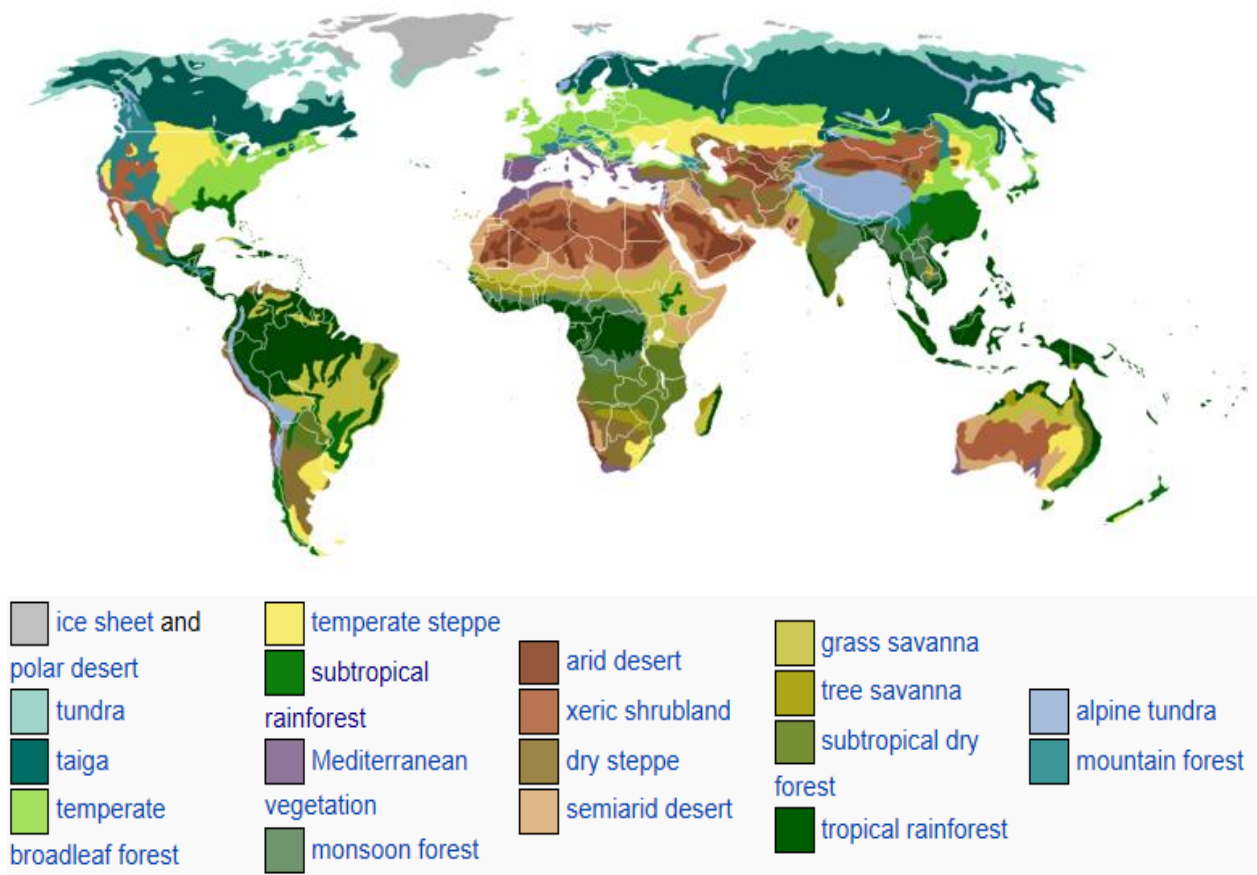
“Green” medicine has been used for thousands of years.

Biomes

Biomes are defined as similar climatic conditions on the Earth, such as communities of plants, animals, and soil organisms.

Biomes are defined by factors such as plant structure (e.g. trees, shrubs, grasses), leaf type (e.g. broadleaf, needle) and climate.

Here is a map showing the major biomes of the world:



Highlight all the biomes that can be found at Birmingham Botanical Gardens – both inside the glasshouses and outside in the gardens.

Ecosystems

An ecosystem is a biological community of organisms (plants, animals, etc.) interacting with each other and the physical (non-living) components of their environment (e.g. air, water, soil). Two ecosystems in the glasshouses at Birmingham Botanical Gardens are the Tropical Rainforest and the Arid Desert.

Ecosystems are systems with inputs, processes and outputs. Inputs are anything that comes into the ecosystem (e.g. minerals from the soil). Processes are the things that go on within the ecosystem (e.g. pollination of flowers by insects). Outputs are anything that leaves the ecosystem (e.g. oxygen as a result of plant photosynthesis).

Stand in one of the glasshouses and try to list as many of the inputs, processes and outputs that you can think of for this ecosystem.

Inputs	Processes	Outputs

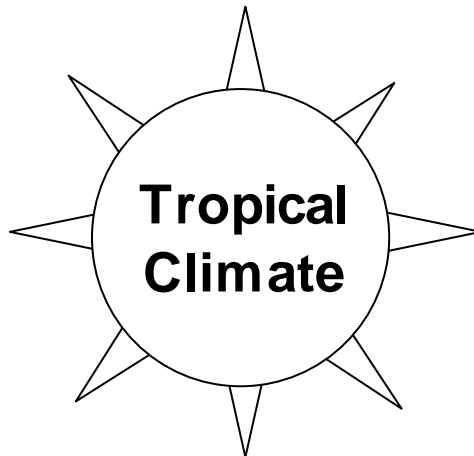
The Tropical House

Setting the scene:

- Rainforests do not have seasons like ours. The weather stays the same, and the trees keep their leaves (evergreen).
- Rainforests cover 6-8% of the world's land surface and contain a large variety of plant and animal life. It is thought that more than half of all the organisms on Earth live in rainforests!
- A 'typical' 5km² of rainforest contains up to 1500 species of flowering plants. The whole of the UK has only 1443 different plant species!

Climate

Fill in the 'spider diagram' with eight words to describe how you feel in a tropical climate.



Is it?

hot	warm
cool	cold
sticky	dry
wet	damp
bright	dull
dark	musty
	comfortable
	uncomfortable

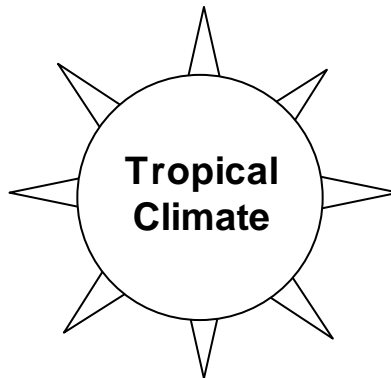
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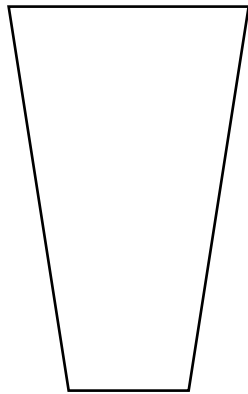


Use the words to help you describe the climate in the rainforest.
Write 2-3 sentences.

Climate Measurement – Tropical House

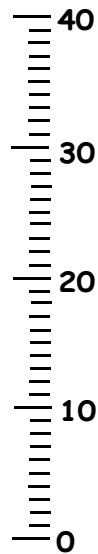
Find the measuring instruments and record the climate measurements:

rainfall (mm)

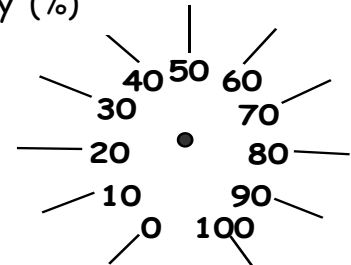


(Draw the top of the water and then write the height)

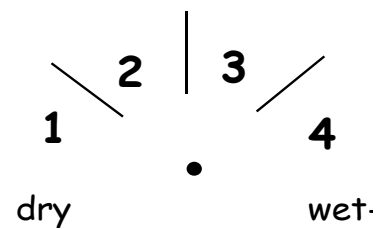
temperature (°C)



humidity (%)

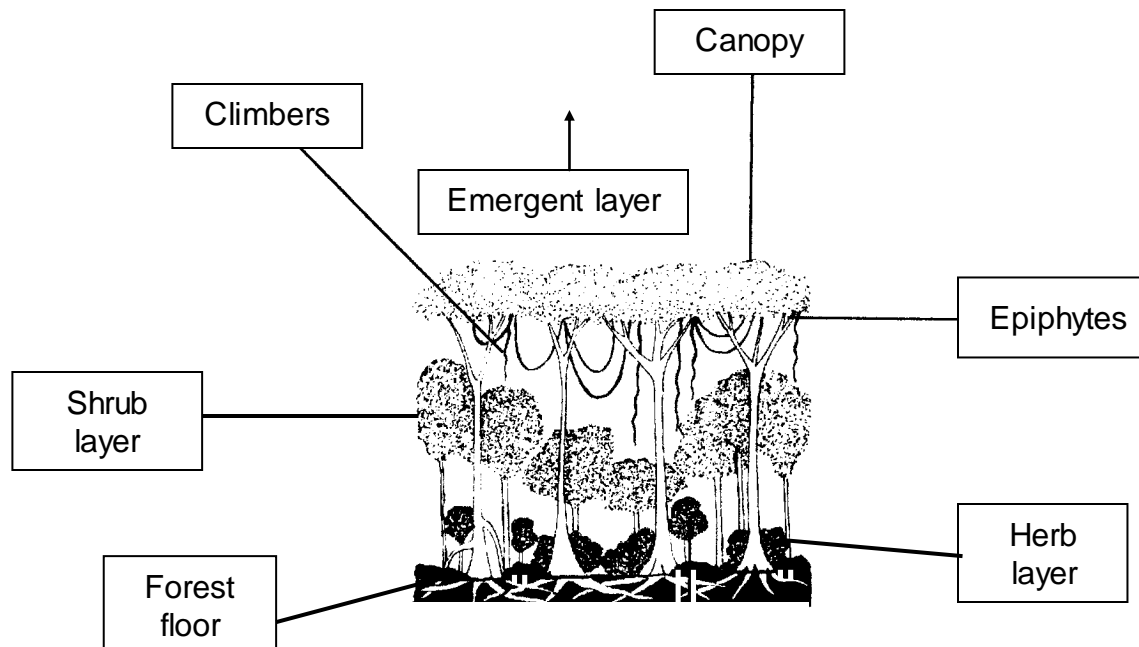


soil moisture



Structure of the Tropical Rainforest

On the diagram below, next to the labels, write the names of plants that grow in each part of the rainforest.



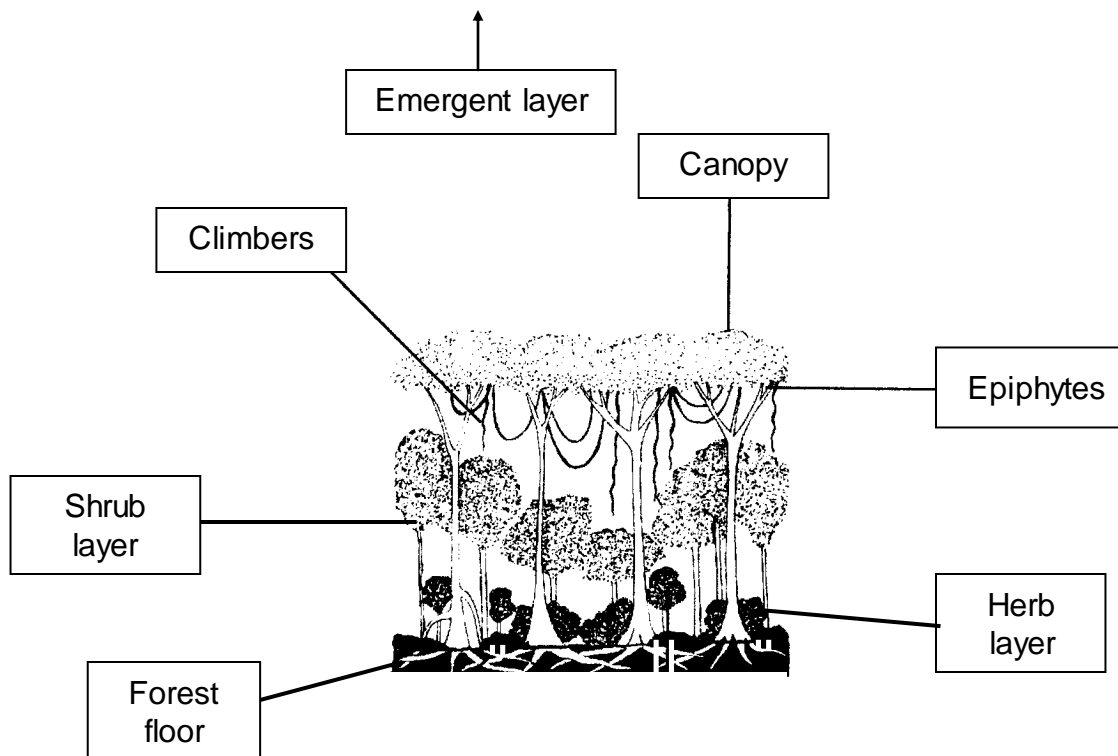
Climate Measurement – Tropical House

Find the measuring instruments and record the climate measurements:

Temperature (°C)	Rainfall (mm)	Humidity (%)	Soil moisture (units)

Structure of the Tropical Rainforest

On the diagram below, next to the labels, write the names of plants that grow in each part of the rainforest.

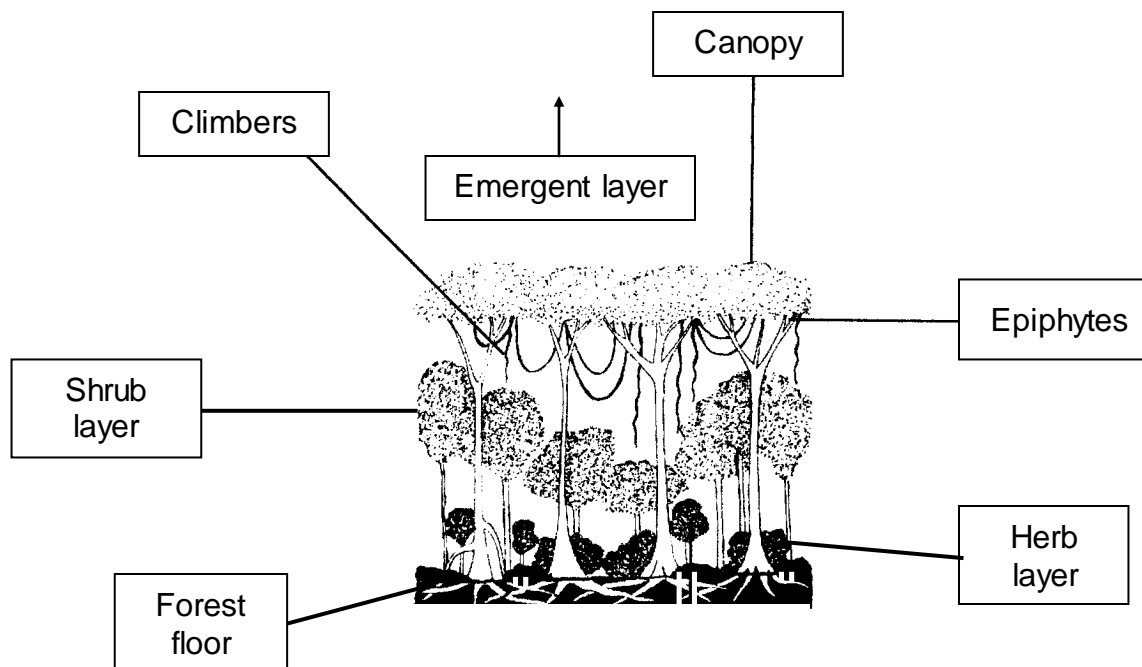


Climate Measurement – Tropical House

In the space below, construct and complete a table of measurements for temperature, rainfall, soil moisture and humidity. Don't forget the units.

Structure of the Tropical Rainforest

On the diagram below, next to the labels, write the names of plants that grow in each part of the rainforest.



Adaptations

The plants have special features to help them cope with the conditions found in the various parts of the rainforest. Find examples of plants in the Tropical or Subtropical Houses that have the following features.

REMOVING WATER	EXAMPLE
Drip tip to shed water	

STAYING UPRIGHT	EXAMPLE
Prop roots	

LIVING IN LOW LIGHT	EXAMPLE
Large leaves	
Different colours on leaves	

CLIMBING	EXAMPLE
Twining around branches	
Tendrils to hold onto branches	

LIVING ON TREES (EPIPHYTES)	EXAMPLE
Water tanks to collect rain	
Aerial roots returning to ground for water	

NUTRIENT-POOR SOIL	EXAMPLE
Sticky hairs to trap insects	
Slippery tube for insects to slide down	

Adaptations

The plants have special features to help them cope with the conditions found in the various parts of the rainforest.

Using your observations, **try to explain how**

....epiphytes collect water when they live on trees?

....carnivorous plants trap and “eat” insects to provide extra nutrients?

....larger leaves on herb layer plants ensure a better rate of survival?

Adaptations

Using your observations, **try to explain how**

....holes in the leaves of climbing plants help them to survive?

....climbing plants hold on to branches?

....Banyan trees spread their branches over large areas without falling over?

Some plants, called **epiphytes**, do not have roots in the soil and just grow on other, taller plants. Where do you think they get their water and nutrients from? Find, name and draw **one** of them that grows in the Tropical House. Add a scale and labels to explain this plant's adaptations.

Name of epiphyte: _____

Drawing:

Take care – some of the plants in the Tropical and Subtropical Houses are carnivorous! This means that they eat animals. Find, name and draw **one** of them. Add a scale and labels to explain how this plant catches and digests its victims.

Name of carnivorous plant: _____

Drawing:

Draw **three** examples of different types of leaves from rainforest plants in the Tropical House. Add a scale and comment on why you think they are of different shapes and sizes.

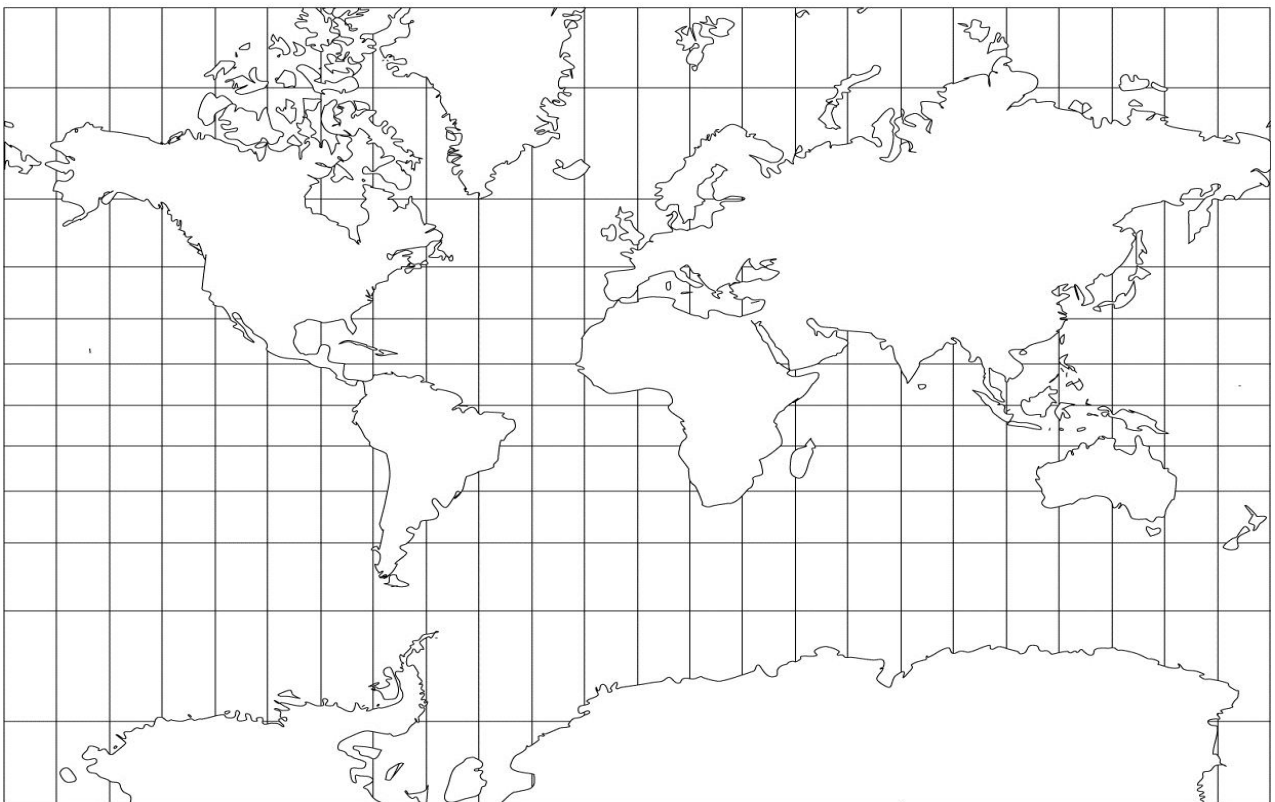
Leaf 1	Leaf 2	Leaf 3
Name:	Name:	Name:
Comment:	Comment:	Comment:

The Mediterranean House

Setting the scene:

- The conditions in this house are not kept the same throughout the year because a Mediterranean climate has warm, wet winters and hot, dry summers.
- This may be ideal for summer holidays but it is very difficult for plants which have to cope with a summer drought.

Mark on the world map where you would find regions that have a Mediterranean climate. (Use the information board in the Mediterranean House to help you; this climate is not only found in Europe.)

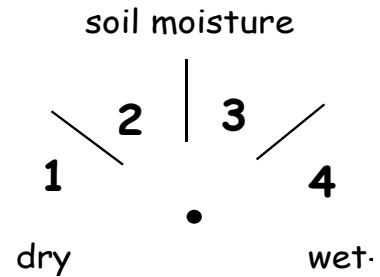
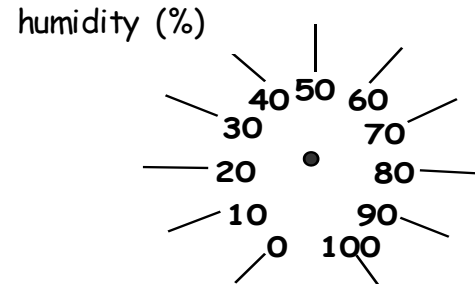
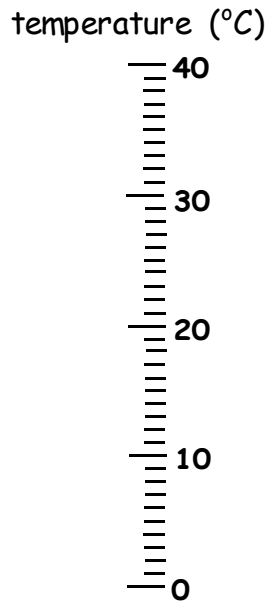
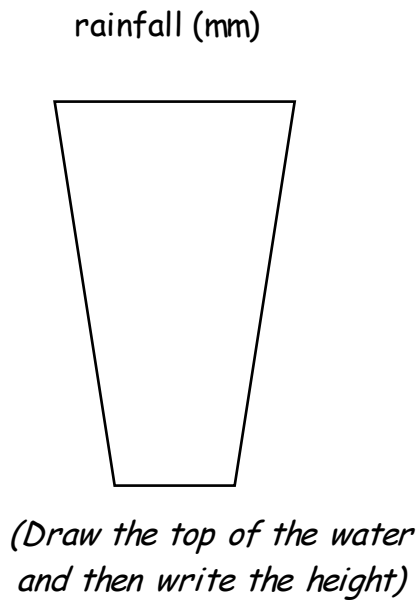


What values does the rainfall range between? _____

What values does the temperature range between? _____

Climate Measurement – Mediterranean House

Find the measuring instruments and record the climate measurements:



Circle three words to describe the climate in the Mediterranean House:

Hot	Dry	Sticky	Ugly
Dark	Boring	Beautiful	Wet
Cold	Green	Damp	Bright




Citrus Plants

Many of the Mediterranean plants in this glasshouse give us citrus fruits. Find 6 citrus plants and write their names in the table:

Name three uses for the fruits of an olive tree:

1	
2	
3	

Find one plant for each of the following uses and record the information in the table.

	Name of plant	Country of origin
		
		
		

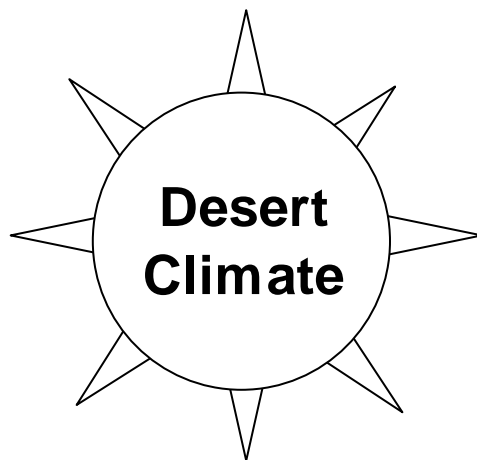
Find and draw a plant that has hairs on the leaves to prevent water loss.	Find and draw a plant that has thorns/spikes for protection.

The Arid House

Setting the scene:

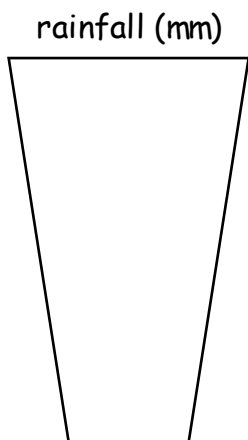
- This climate creates places which are difficult to live in, so the plants living in deserts have very special features.
- Desert climates have very bright sunlight, strong winds, high daytime and low night-time temperatures.
- Rainfall is less than 250mm per year and only falls during a few weeks each year.

Climate: Fill in the spider diagram with words which describe how you feel in a desert climate.



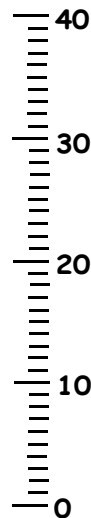
Is it?	
hot	warm
cool	cold
sticky	dry
wet	damp
bright	dull
dark	musty
	comfortable
	uncomfortable

Fill in the climate measurements:

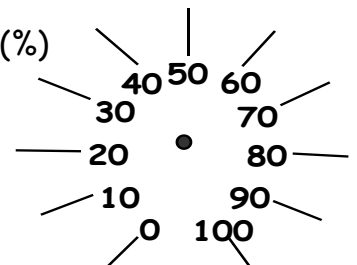


(Draw the top of the water and then write the height)

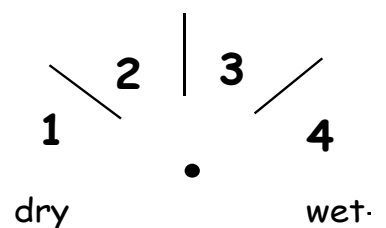
temperature (°C)



humidity (%)



soil moisture

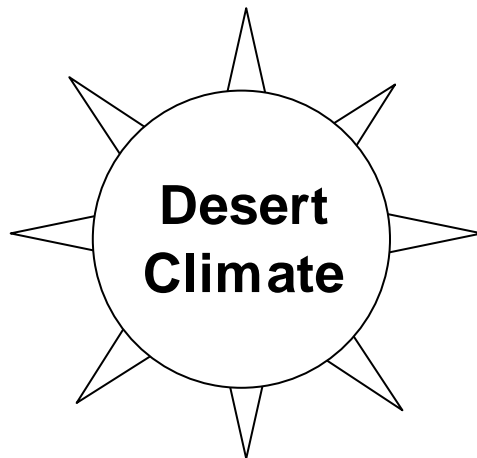


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Climate Measurement – Arid House

Find the measuring instruments and record the climate measurements:

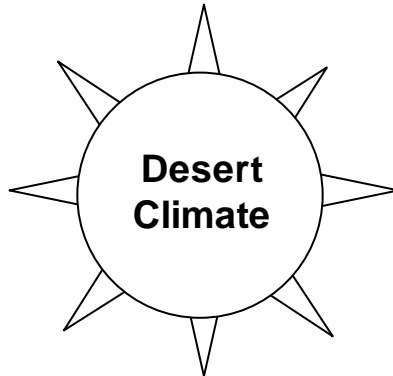
Temperature (°C)	Rainfall (mm)	Humidity (%)	Soil moisture (units)

The Arid House

Setting the scene:

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Climate: Fill in the 'spider diagram' with eight words to describe how you feel in a desert climate.



Use the words to write a sentence describing the climate in the desert.

In the space below, construct and complete a table of measurements for temperature, rainfall, soil moisture and humidity. Don't forget the units.

Arid House Adaptations

All desert plants which store water are called **SUCCULENTS**. They also have a range of other ways of surviving.

Ways of saving water

FEATURE	EXAMPLE
Thick cuticle (skin) and waxy coating	
Ridges	
No leaves	
No stem	

Protection from the sun

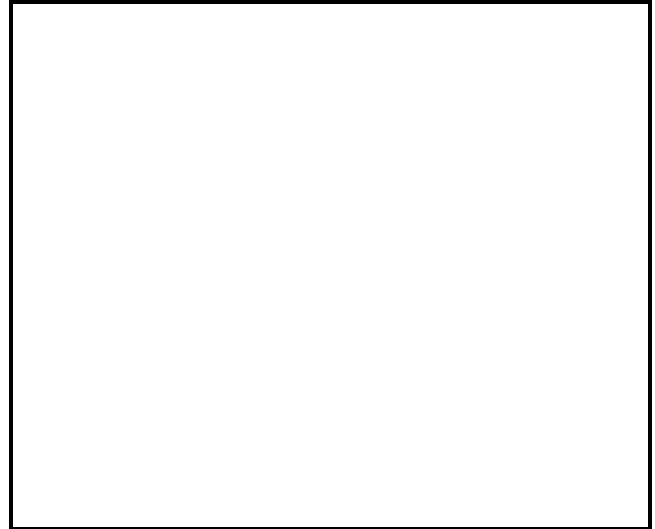
FEATURE	EXAMPLE
Growing upright	
Hairy	

Protection from animals

FEATURE	EXAMPLE
Thorns or prickles	
Bitter sap	

Adaptations

Choose one plant from the Arid House. Draw it in the box and label the adaptations that help it to survive in the desert.



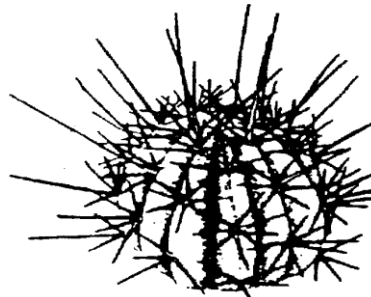
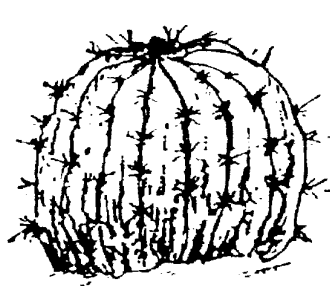
Economic Plants



Lots of plants from the arid desert regions of the world can be used for food, medicines or raw materials.

Fill in the table below to identify a range of products. The symbols on the large plant labels and the smaller black labels will help you.

Name of plant	Country of origin	Product



Additional Activity (Inside)

Choose one plant from any of the climates you have seen today. Make a detailed drawing and description of this plant, including the country or countries in which it grows, products, adaptations, etc.

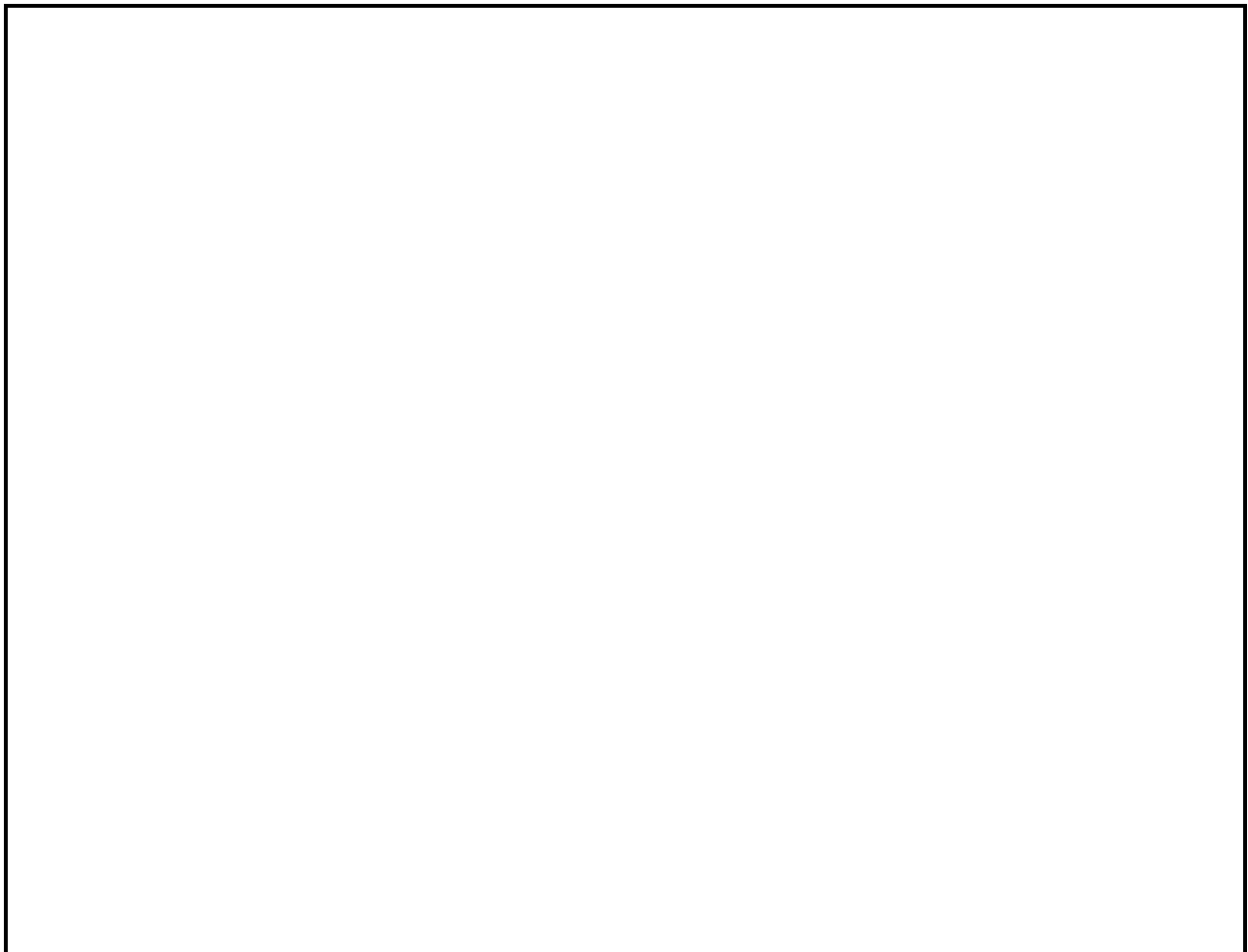
Name of plant: _____

Additional Activity (Outside)

Use the box below to sketch part of the outside area of the Botanical Gardens. You may choose to sit on the bank outside the café area.

Helpful tips when drawing a sketch:

- Think about the size of different objects, e.g. a tree will look smaller the further away it is.
- Use shading to show light and darkness.
- Your drawing doesn't need to be totally accurate, it just needs to show basic outlines/features.
- Label 2 PHYSICAL parts of the drawing, e.g. anything that humans have not built.
- Label 2 HUMAN parts of the drawing, e.g. anything that humans have built.



Glossary

Adaptation	Any feature of a plant or animal which helps it to survive its environment.
Canopy	The 'roof' made from the branches of trees.
Climate	A way of describing the typical weather conditions of a place.
Environment	All the conditions which affect the place where a plant lives, e.g. light, water, other living things.
Epiphytes	Plants which grow on other living things. However, unlike parasites, they do not harm their hosts by taking food or water from them.
Habitat	The place where a certain plant may live. Usually a description of the kind of environment there.
Herb	A plant which does not have a woody stem for support so it is usually not very large.
Humidity	The amount of moisture (water vapour) in the air.
Hygrometer	The equipment used to measure humidity.
Succulent	A plant which stores in the leaves or stem to help it live in desert climates.
Weather	The conditions such as temperature, rainfall and humidity in a place at that time.

