Year 9 Work 27th April and 2nd May Name:

Complete the work below either in the booklet or on Teams – hand any printed copies to your Tutor on Wednesday 3rd May.

English	**Maths**
Make sure you have completed Home Learning 1, 2 and 3.	1) Complete the Prior Knowledge Check. 2) Sparx Maths – Complete the extra Home Learning that has been set. If you do not know your password, go to the Sparx site, and request a password reset.
Science	**History**
Read through the information on the Periodic Table and answer the questions.	Read through the information on the British Empire and answer the questions.
Geography	
Read through the information on "Why is the nutrient cycle important to the rain Forest?" and answer the questions.	

Maths
Unit 9: Probability - Prior Knowledge Check

1) Fill in the missing words in the sentences below:
   a) Events are mutually exclusive if they _____ happen at the same time.
   b) 'Picked at random' means that each item is equally _____ to be picked.
   c) Theoretical probability is the likelihood that an _____ will happen based on pure mathematics.

2) There are 4 Kings in a deck of 52 cards.
   a) What is the probability of picking a King?
   b) What is the probability of NOT picking a King?

3) The school canteen must serve one vegetable with every main meal choice. The probabilities of a student choosing each vegetable are:

   P(sweetcorn) = 0.15 P(tomatoes) = 0.1 P(green beans) = 0.2

   P(peas) = 0.3 P(cabbage) = 0.1 P(carrots) = 0.15

   a) Which vegetable has the highest probability of being picked?

b) Which two vegetables have the lowest probability of being picked?

4) Calculate:

a)1 – 0.9 b) 1 – 0.37 c) 1 – 0.23 d)1 – 0.04 e)0.4 + 0.32

f) 0.5 + 0.47 g) 0.6 + 0.52 h) 0.72 + 0.88 i) 0.87 + 0.96

j) 100 – 85 k) 100 – 63 l) 100 – 42 m) 100 – 32 n) 100 – 21

5)

a) $\frac{2}{5}$ of 20 = f) $\frac{2}{6}$ of 18 = k) $\frac{3}{6}$ of 18 = p) $\frac{5}{6}$ of 12 =

b) $\frac{4}{6}$ of 24 = g) $\frac{4}{7}$ of 21 = l) $\frac{2}{3}$ of 24 = q) $\frac{2}{3}$ of 21 =

c) $\frac{2}{3}$ of 18 = h) $\frac{2}{5}$ of 20 = m) $\frac{3}{4}$ of 28 = r) $\frac{3}{5}$ of 35 =

d) $\frac{4}{7}$ of 28 = i) $\frac{6}{8}$ of 24 = n) $\frac{3}{8}$ of 32 = s) $\frac{4}{6}$ of 36 =

e) $\frac{3}{4}$ of 20 = j) $\frac{5}{9}$ of 27 = o) $\frac{5}{9}$ of 27 = t) $\frac{6}{7}$ of 35 =

6) Convert the decimals to fractions and percentages:

(a) 0.7 (b) 0.4 (c) 0.15 (d) 0.88 (e) 0.79 (f) 0.04

(g) 0.404 (h) 0.125 (i) 0.625 (j) 0.123 (k) 1.6 (l) 2.25

7)

(a)

Fraction	Decimal	Percentage
		10%
$\frac{4}{5}$		
	0.17	
$\frac{3}{20}$		

(b)

Fraction	Decimal	Percentage
	0.11	
$\frac{9}{20}$		
		68%
$\frac{3}{8}$		

(c)

Fraction	Decimal	Percentage
$\frac{2}{3}$		
	0.003	
		10.5%
$\frac{9}{80}$		

(d)

Fraction	Decimal	Percentage
	1.4	
$\frac{19}{10}$		
		265%
$\frac{11}{4}$		

8) Complete the two-way table:

	Car	Bus	Walk	Total
Year 9	10	8		24
Year 10		7	5	
Total	16			42

50 children were asked if they wanted to go bowling or to the cinema.

17 girls and 11 boys wanted to go bowling.
12 boys wanted to go to the cinema.

(a) Use this information to complete the two-way table below.

	Bowling	Cinema	Total
Boys			
Girls			
Total			

(b) How many children, in total, want to go to the cinema?

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Science

Development of the periodic table

Science Atoms and the periodic table

Keywords

Properties are the characteristics of a substance that describe and identify it.

The **periodic table** is an arrangement of all the elements based on their atomic number and properties.

An **element** is a substance made from one type of atom.

What are properties?

The term properties is used to describe the characteristics of a substance. Properties can be either chemical or physical.

Chemical properties	Physical properties
• reactivity	• colour
• flammability	• density
• acidity	• hardness
• toxicity	• melting and boiling points

The early Periodic Table

Newlands

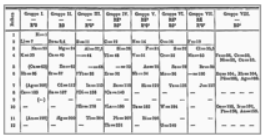
"I spotted a pattern. If elements were written in order of atomic weight, every eighth element had similar chemical properties. I called this the Law of Octaves."

Newland's Law of Octaves						
He	Li	Be	B	C	N	O
F	Na	Mg	Al	Si	P	S
Cl	K	Ca				

1863 John Newlands | 1869 Dmitri Mendeleev | 1913 Henry Moseley

Mendeleev

"I arranged the elements based on their atomic weight. I assumed atomic weights had been calculated incorrectly and moved elements to keep those with similar properties together. I left gaps in my table for undiscovered elements."



1863 John Newlands | **1869 Dmitri Mendeleev** | 1913 Henry Moseley

Moseley

"I discovered the proton and in doing so was able to reorder Mendeleev's table so the atoms were laid out in increasing atomic number rather than weight. This led to the modern periodic table as we know it today."

1863 John Newlands | 1869 Dmitri Mendeleev | **1913 Henry Moseley**

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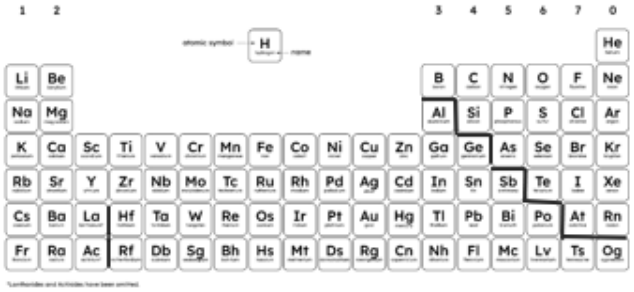
The modern Periodic Table

The modern periodic table arranges elements by their atomic number.

Metals are on the left of the periodic table and non-metals are on the right.

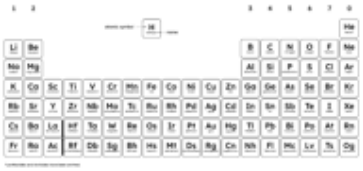


Whilst Mendeleev's periodic table was close to the modern version, there were some important differences:

Mendeleev's table

- arranged by atomic mass
- had gaps
- had 63 elements
- has no Group 0

Modern periodic table



- arranged by atomic number
- no gaps
- has 118 elements
- has Group 0

Summary Development of the periodic table

- Properties are the chemical and physical characteristics of substances.
- The three major contributors to the modern periodic table were Newlands, Mendeleev and Moseley.
- The layout of the periodic table changed as more was learnt about the properties and particles that make up the elements.
- The modern periodic table is arranged by atomic number. It has columns called groups, and rows called periods.

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Task 1: What are properties?

a) **Define** the term property.

b) **Circle** the chemical properties and underline the physical properties.

reactivity	colour	flammability
hardness	acidity	melting point

Task 2: The early periodic table

a) **Draw** lines to match the scientists to their periodic table ideas.

Newlands	left gaps for undiscovered elements
Mendeleev	ordered elements by atomic number
Moseley	saw each eighth element has similar properties

b) Starting with the earliest, **number** the scientists to show the order in which they contributed to the development of the periodic table:

☐ Moseley ☐ Newlands ☐ Mendeleev

Task 3: The modern periodic table

a) **Place a tick** to show if the description is for Mendeleev's or the modern periodic table.

Description	Mendeleev's periodic table	The modern periodic table
arranged by atomic number		
Group 0 elements missing.		
Gaps present.		
arranged by atomic weight		

b) **Complete** the sentences by filling in the gaps.

- John _____ proposed the Law of Octaves. As he spotted that every _____ element had similar _____.
- Dmitri _____ helped create the modern periodic table by leaving gaps for _____ elements.
- Both Newlands and Mendeleev ordered the elements by their atomic _____.
- The modern periodic table is arranged by atomic _____. It has columns called _____ and rows called _____.

c) **Whose** table of elements improved on Newlands' and **how**? (3 marks)

_____

_____

_____

_____

Extension – memorise the first two columns of the periodic table!

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History

The British Empire (1776-1900)

Enquiry: What did British colonialism look like in the nineteenth century?

1 The British Empire, 1776-1900

In the two hundred years before 1776, Britain had built up a colonial empire. Most of Britain's colonies were in North America and the Caribbean. This empire was very important to Britain. It allowed Britain to show its power overseas and to make vast sums of money. In 1776, disaster struck. Britain's thirteen American colonies decided to overthrow British power and become an independent country - the United States of America. The loss of America shocked Britain. However, increasingly turning its gaze towards the East, the British Empire rebuilt its power and influence. Over the course of the nineteenth century, Britain claimed control over colonies in Asia, Africa and Australia. The British empire was so large that it became popular to refer to it as 'the empire on which the sun never sets'.

2 Political dominance

One prominent feature of British colonialism was political dominance. Political dominance means having power over how a place and its people are governed. In many of Britain's colonies, there was a strict political hierarchy (a structure of power in which some people are above others). The British were at the top and made all of the important decisions and laws. The British also demonstrated their power through violence and military force, using the army to establish and maintain control. This political power was often resisted by people in the colonies who wanted control over their own lives on their own lands.

3 Economic exploitation

Another common feature of colonialism is economic exploitation. In the context of nineteenth-century British colonialism, economic exploitation means unfairly taking advantage of people in the colonies to increase Britain's own wealth (money). In British colonies, this happened in a number of ways. It could involve using British power to take land (often by force) from people in the colonies. It could mean forcing people to pay taxes to the British government. It could involve using people in the colonies as cheap labour - making them work for little money and in poor conditions. These are just a few examples of the ways in which Britain exploited its colonies for its own economic benefit.

4 Culturalism and racism

Colonialism was built upon culturalism and racism. In the context of nineteenth-century British colonialism, culturalism involved the belief that the British way of life was better than those of other cultures. This attitude glorified British society as the best in human history. Culturalism showed little respect for the cultures and ways of life of other peoples and societies. Racism involved the belief that the white 'race' was superior to other 'races'. In the nineteenth century, racism was based upon incorrect 'scientific' ideas that humanity is split up into different groups, called 'races', which are biologically separate from one another. This idea has now been proven scientifically false. These attitudes defined the unequal nature of colonialism. The ideas of culturalism and racism were used to justify British power - many in Britain argued that Britain deserved to rule over and exploit other people because they believed that British culture and the white race were superior. Many even claimed that British rule was for the benefit of peoples in the colonies, whom they labelled as 'backward'. Many people who experienced British colonialism in the colonies disagreed; they challenged colonialism's culturalist and racist beliefs and structures.

5 Challenge reading: China - a complex case

Interestingly, the situation could be more complex than this. There were many places that were not officially British colonies, but which many historians argue were still part of the British Empire. These places were not under Britain's direct political control, but were still influenced by British power. One example of this is China. In the nineteenth century, China was still ruled by its own leaders (the Qing empire) and was not under the political control of the British monarch or British governors. However, Britain and other European empires did used their militaries (armies and navies) to wage wars against China. These war are known as the Opium Wars. When Britain and the European empires won these wars, they forced Chinese leaders to sign agreements that they did not want to sign. One of the main things these agreements forced China to do was to allow British merchants to sell opium - a dangerous drug - to Chinese people. Britain made loads of money selling this dangerous drug to Chinese people, against the wishes of the Chinese government. Furthermore, the small area of Hong Kong was taken from China as a British colony, however the vast majority of China remained under Qing rule. This showed that the British Empire had power over China, even though it did not directly govern the country. Challenge reading: China - a complex case

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6 Comprehension Questions

1. Where were most of Britain's colonies in 1776?

2. What happened in 1776 that was disastrous for the British Empire?

3. Why did many people refer to the British Empire as 'the empire on which the sun never sets' in the nineteenth century?

4. What were some of the key features of British colonialism in the nineteenth century?

5. Challenge question (read the challenge reading to answer this): How was China affected by British power despite the fact that it was not an official British colony?

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Geography

Why is the nutrient cycle important to the rain Forest?

Interdependence in the rainforest

All the parts of an ecosystem are linked. If one part changes, another part will change!

This is particularly true for tropical rainforests because **biodiversity** is so high.

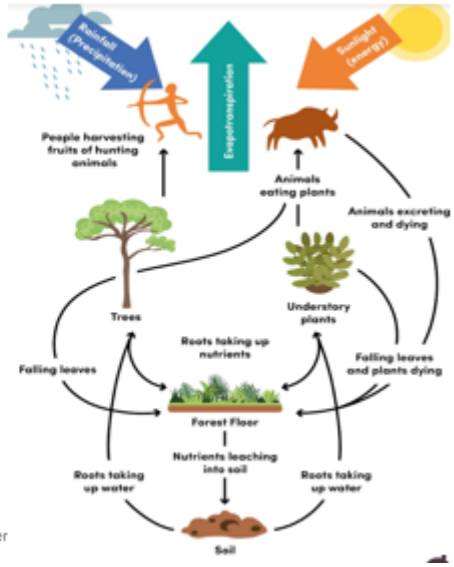
Biodiversity is the variety of plants and animals living in a particular area.

Interdependence is the way that all parts of the rainforest (climate, water, soils, plants, animals, and humans) rely on each other.

Credit: Wikipedia -L. Stell Mineral Lick

Interdependence in the rainforest

- This diagram shows interdependence of the rainforest.
- It shows how the soil, climate, plants, and animals all rely on each other in the ecosystem.



Credit : Oak Acader

Key terminology

	Definition
Nutrient cycle	The movement and exchange of nutrients from living things, to the earth, and then back again.
Biomass	The total quantity or weight of organisms in an area.
Litter	Dead plants or animals that fall to the floor. They start to decompose here.
Vegetation	The different plants of an area or a region.
Store	Nutrients are cycled between three stores; litter (dead organisms such as leaves), biomass (living organisms), and soil.
Transfer	Nutrient transfer is the transfer of nutrients between the stores.

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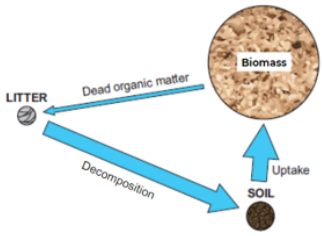
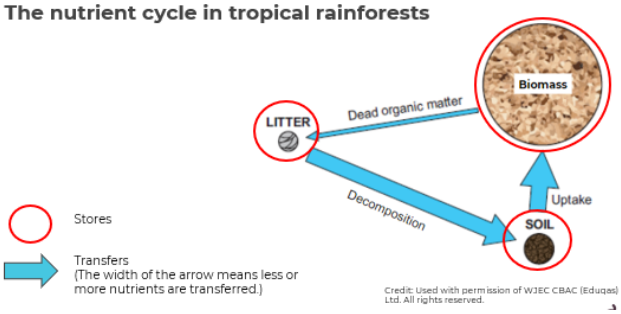
The nutrient cycle in tropical rainforests

Every living organism needs nutrients to grow and live.

Nutrients are transferred around an ecosystem, like the tropical rainforest, in a never-ending cycle.



The nutrient cycle in tropical rainforests



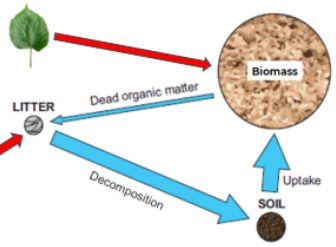
Stores

Transfers
(The width of the arrow means less or more nutrients are transferred.)

The nutrient cycle in tropical rainforests

This leaf is part of the **biomass** store; when it is living and attached to a tree, it is full of nutrients.

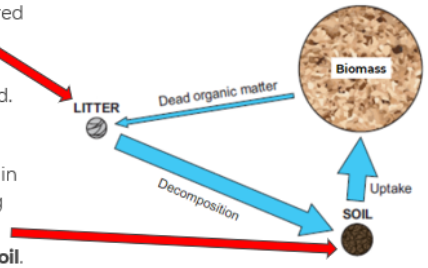
When the **tree dies**, the leaf falls to the rainforest floor. Now it is part of the leaf **litter**.



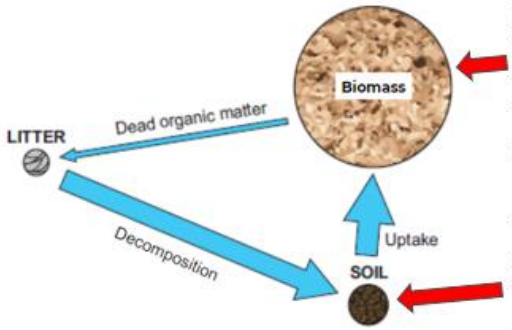
The nutrient cycle in tropical rainforests

The nutrients are now stored in the **litter.** They start to **decompose** because the rainforest is hot and humid.

Decomposers act quickly in these conditions, breaking down the nutrients and transferring them to the **soil**.



The nutrient cycle in tropical rainforests

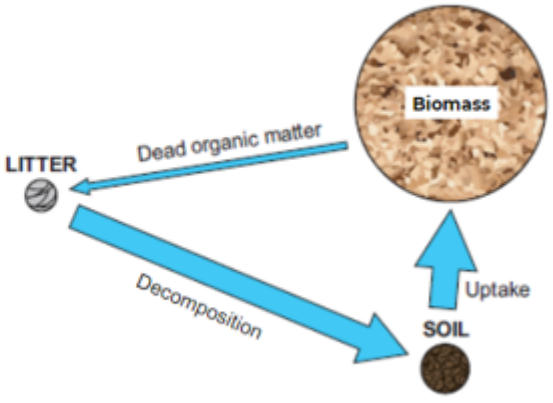


Plant roots absorb nutrients from the soil as trees grow. This is called **plant uptake**. These nutrients are stored in the **biomass**.

The nutrients stored in the **soil**, leave this store quickly. This means soils in the rainforest are not very fertile.

The nutrient cycle in tropical rainforests

This process repeats again and again, which makes it the **nutrient cycle.**



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Questions:

Which of the following statements is true?

Option 1

Stores are the transfer of nutrients.

Option 2

Biomass is the largest store in the nutrient cycle.

Option 3

Nutrient transfer is the moving of nutrients between the stores.

Option 4

Litter is the amount of animals in an area.

Task: Draw the nutrient cycle, including the labels.

Success criteria:
1. Use a pencil.
2. Make sure all labels are in the correct place.
3. Leave enough room to write annotations around your diagram.

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1. Describe how nutrients move through the nutrient cycle

Success criteria:
1. Include all the key terms from the list below.
2. Link the terms together to create a cycle.

Use the following terms in your writing:

biomass **plants die** **litter** **decomposes** **soil** **plant uptake** **store** **transfer**