

Science: Periodic Table

1. Key words	
Element	A substance that cannot be broken down into other substances.
Compound	A substance made up of atoms of two or more elements, strongly joined together.
Atom	The smallest part of an element that can exist.
Molecule	A group of two or more atoms, strongly joined together.
Chemical symbol	A one- or two-letter code for an element that is used by scientists in all countries.

2. Elements and compounds			
Name	Hydrogen	Oxygen	Water
Element or compound	Element	Element	Compound
Properties	Gas at room temperature.	Gas at room temperature.	Liquid at room temperature.
Formula	H ₂	O ₂	H ₂ O
Description	2 Hydrogen atoms joined together	2 Oxygen atoms joined together	2 Hydrogen atoms joined to 1 Oxygen atom

3. Properties of metals and non-metals	
Metals	Non-metals
Shiny	Dull
High melting points	Low melting points
Good conductors of electricity	Poor conductors of electricity
Good conductors of heat	Poor conductors of heat
High density	Low density
Malleable and ductile	Brittle

4. Basic periodic table structure																						
1		2														3		4	5	6	7	0
				H																		He
Li		Be														B	C	N	O	F	Ne	
Na		Mg														Al	Si	P	S	Cl	Ar	
K		Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr				
Rb		Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe				
Cs		Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn				
Fr		Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og				
Red		Metals																				
Yellow		Non-metals																				
Groups		Columns in the Periodic Table, they go downwards																				
Periods		Rows in the Periodic Table, they go sideways																				
Discovery		The modern periodic table is based on the model proposed by Dmitri Mendeleev at the end of the 19 th century																				

5. Element Symbols			
Element symbols are used so that people in any country can understand which chemicals are used in a reaction			
Element	Symbol	Element	Symbol
Hydrogen	H	Oxygen	O
Magnesium	Mg	Copper	Cu
Zinc	Zn	Sodium	Na
Aluminium	Al	Carbon	C

Science: Periodic Table

6. Word Equations	
Word equations represent the formation of compounds during a reaction	
Burning magnesium in air: Magnesium + Oxygen → Magnesium oxide	
Reacting hydrochloric acid and magnesium Magnesium + hydrochloric acid → Magnesium chloride + Hydrogen	

7. Structure of the atom		
	Key word	Definition
1	Nucleus	The center of an atom. Contains protons and neutrons
2	Proton	A positively charged particle found in the nucleus
3	Neutron	A neutral particle found in the nucleus. Has no charge
4	Electron	A negatively charged particle found in energy levels (shells) around the nucleus

8. Group 1 elements – Alkali Metals			
Elements	Physical properties	Chemical properties	Patterns
Li, Na, K, Rb, Cs, Fr	Lower density than other metals Softer than other metals	Very Reactive	Reactivity increases down the group Melting and boiling point decreases down the group

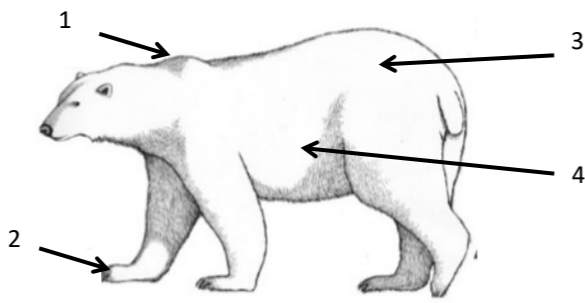
9. Group 7 elements – Halogens			
Elements	Physical properties	Chemical properties	Patterns
F, Cl, I, Br	Does not conduct electricity	Very Reactive A more reactive halogen will take the place of a less reactive halogen in a compound.	Reactivity decreases down the group Melting and boiling point increases down the group

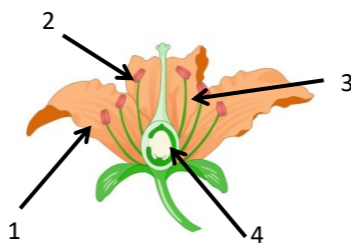
Challenge Questions	
1	Which elements have the chemical symbols of Ca, Cl, Li and He?
2	Gold is not very reactive. Describe why gold is sometimes used in electronics, but is not used to build bridges
3	Why was Mendeleev's model of the periodic table accepted by scientists?
4	Explain why the reactivity of alkali metals increases down the group

Science: Inheritance and Classification

1. Variation	
Organisms within a species have variations.	
Inherited variation	Environmental variation
Variations caused by genes gained from parents	Variations caused by surroundings
Examples	Examples
Eye colour	Scars
Blood group	Accent
Sex	Length of hair
Some variations are both inherited and environmental ; height, weight, skin tone, intelligence	
Key words	
Variation	The differences in characteristics between living things
Species	A group of organisms that are very similar to each other and can produce fertile offspring
Characteristics	The individual differences between organisms
2. Challenge Questions	
1	Why do you think animals and plants are sorted into groups?
2	Describe why identical twins are only genetically identical
3	Explain the adaptations of organisms to prevent being eaten
4	Why do you think climate change is affecting the population numbers of polar bears?
3. Continuous and discontinuous variation	
Continuous variation	Discontinuous variation
A characteristic that changes gradually over a range of values	A characteristic that has a limited number of possible values
4. Genes	
Key words	
DNA	Genetic information. It has all the instructions a living organism needs to grow, reproduce and function
Gene	A small section of DNA that has the genetic code for a specific characteristic
Identical twins	Non identical twins
From a single egg fertilised by a single sperm that splits in half before implantation	From separate eggs that were released at the same time and fertilised by separate sperm
They have the same DNA code and will be the same sex	They have different DNA code so can be different sexes

Science: Inheritance and Classification

Adaptations		
Organisms have special features that make them suited to their environment		
	Adaptation	How it helps it to survive
1	Waterproof fur	Prevents the cold water toughing the skin
2	Large wide feet	Prevents sinking in the snow
3	Small surface area to volume ration	Reduces heat loss from the skin
4	White fur	Camouflages it against the snow so it can hunt prey
		

Plant reproduction			
1	Petal	Attracts insects for pollination	
2	Anther	Covered in pollen	
4	Stigma	Captures pollen from other plants	
5	Ovary	Where fertilisation takes place	

Classification	
Key Word	Definition
Vertebrate	An animal that contains a back bone
Invertebrate	An animal that does not contain a back bone
The vertebrates can be split into 5 main groups	
Group	Common Features
Mammal	Warm blooded Feed young with milk Internal fertilisation Fur covered skin
Reptile	Cold blooded Hard scaly skin Lays leathery shelled eggs
Fish	Cold blooded Slimy scales Gills External fertilisation of soft jelly eggs
Amphibian	Cold blooded Slimy skin External fertilisation of jelly like eggs
Bird	Warm blooded Lays hard shelled eggs Wings Feathers