

1. Acids and alkali

Acid	A solution with a pH value less than 7.
Alkali	A soluble base with a pH value more than 7
Neutral	A solution with a pH of 7
pH Scale	A measure of how acidic or alkaline a solution is.
Indicator	A solution that can show whether a substance is acidic, alkaline, or neutral by changing colour.

2. pH Scale

Universal Indicator



	Name	Examples
A	Acid	Lemon Juice, Hydrochloric acid
B	Neutral	Milk, Water
C	Alkali	Bicarbonate of soda, Sodium hydroxide

3. pH Scale

Indicator	Colour in acid	Colour in neutral	Colour in Alkali
Universal indicator	Red	Green	Deep Purple
Methyl orange	Red	Yellow	Yellow
Litmus blue	Red	Blue	Blue
Phenolphthalein	Colourless	Colourless	Pink
Red cabbage juice	Red	Purple	Green-Yellow

4. Neutralisation

Reactions in which acids react with a base (or alkali) to cancel out the effect of the acid.

These reactions form a neutral solution with a pH of seven.




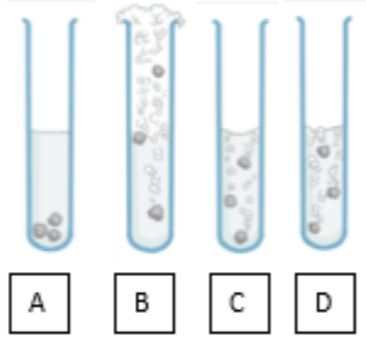
5. Properties of metals and non-metals

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

6. Reactions with metals

Reactions	Products
Metals and oxygen	Metal oxide e.g. magnesium oxide
Metals and acids	Metal salt and hydrogen e.g. iron chloride
Metal carbonates and acids	Metal salt, water and carbon dioxide

7. Chemical Reactions	
Chemical reaction	A change in which atoms are rearranged to create new substances.
Physical Change	A change that is reversible, in which new substances are not made. E.g. changes of state and dissolving.
Reversible reaction	A change in which it is possible to get back to the original substances. E.g. dissolving and changes of state.
Signs of a chemical reaction:	
<ul style="list-style-type: none"> • change in colour • change in temperature • gas given off 	

8. Reactivity series		
Describes how reactive different metals are compared to one another.		
Potassium Sodium Magnesium Calcium Aluminium Zinc Iron Copper		Most reactive Least reactive
Example of the reaction of metals in acid:		
		
	Order of reactivity	Reason
A	Least reactive	No gas bubbles produced
B	Most reactive	Most gas bubbles produced
C	3 rd most reactive	More bubbles than A, but less bubbles than D
D	2 nd most reactive	More bubbles than C, but less bubbles than B

9. Displacement reactions	
When a more reactive metal reacts with a compound containing a less reactive metal, this is known as a displacement reaction.	
Example 1:	
Reactants	Magnesium + Copper sulphate
Reactivity	Magnesium is higher on the reactivity series than Copper
Products	Magnesium sulphate + Copper
Equation	Magnesium + Copper sulphate → Magnesium sulphate + Copper
Example 2:	
Reactants	Zinc + Magnesium sulphate
Reactivity	Zinc is lower on the reactivity series than Magnesium
Products	Zinc + Magnesium sulphate
Equation	Zinc + Magnesium sulphate → Zinc + Magnesium sulphate

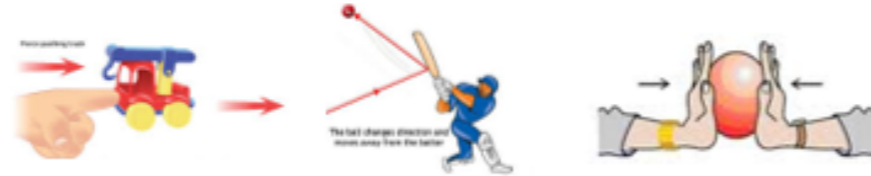
Challenge Questions	
1	How could you work out the pH of a substance?
2	Write a word equation for the reaction between hydrochloric acid and sodium hydroxide
3	Describe a method to work out the reactivity of 4 different unknown metals
4	Evaluate which indicator would be the best to use on a range of different acids and alkali. Justify your response

1. Key Words –forces

Mass	The amount of matter within an object. Measured in kilograms
Weight	The force of gravity acting on a mass. Measured in Newtons
Contact force	Contact force acts when two objects are physically touching, such as friction, drag, up-thrust
Non-contact force	Non-contact force acts when two objects are not touching, such as gravity and magnetic force
Balanced force	When forces are acting opposite each other and are equal sizes they are balanced
Unbalanced force	When forces acting opposite each other and are not equal sizes, they are unbalanced

2. Types of force

A force will change the speed, direction or shape of an object



Contact Forces	Non-contact forces
Elastic force	Gravity
Applied force	Electrostatic force
Weight	Magnetic force
Tension	
Normal force	
Friction (including air resistance, water resistance & drag)	

3. Mass and weight

The weight of an object is affected by its mass and the gravitational field it is experiencing

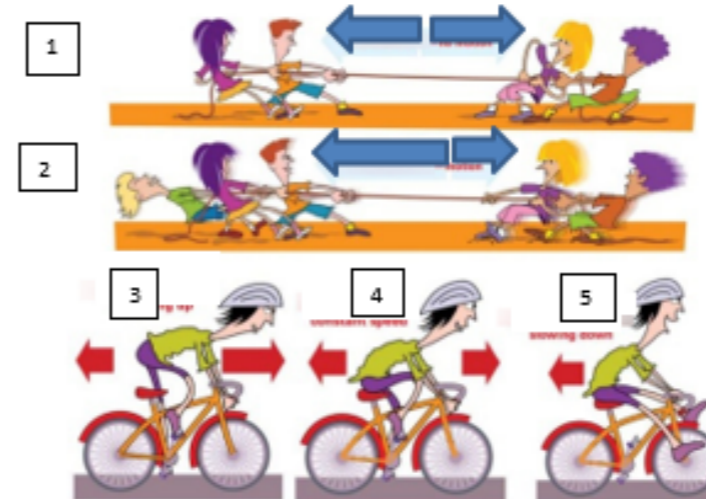
Weight can be calculated using this equation

$$W = mg$$

Weight of object = mass of object x acceleration of gravity

4. Balanced and unbalanced force

- 1 Forces are balanced, there is no movement in either direction
- 2 Forces are unbalanced, everyone will move in the direction of the larger force
- 3 There is more forward force so the bike speeds up
- 4 Forces are balanced, speed is constant
- 5 There is more force acting backwards so the bike slows down



5. Key Words – Space	
Solar system	Consists of 8 planets, including Earth, orbiting the Sun. The Sun is one star in our Milky Way galaxy.
Orbit	To move in a regular, repeating curved path around another object, kept in place by a gravitational field
Rotate	To spin. E.g. Earth rotates on its own axis
Year	The length of time it takes for a planet to orbit the Sun.
Day	The length of time it takes for a planet to rotate once on its axis (On Earth = 24 hours)
Satellite	Any object or body in space that orbits something else. They can be natural or artificial (man-made).
Moon	A natural satellite which orbits a planet

6. Day and night	
1. North pole	
2. Earth's axis	
3. Northern hemisphere	
4. Night time	
5. Day time	
6. Equator	
7. South pole	
8. Southern hemisphere	

Challenge Questions	
1	Where would friction be useful when riding a bike?
2	How can the air resistance of a car be reduced and why does this work?
3	How is the temperature in the UK different in summer and winter? Why?
4	Why is your mass the same on the moon and on Earth, but your weight is not?

7. Seasons	
The Earth's axis has a tilt of 23.4° which gives rise to our seasons.	
1	Sun's path across the sky in summer
2	Sun's path across the sky in spring and autumn
3	Sun's path across the sky in winter

8. The night sky		
Galaxy	A collection of stars, our galaxy is known as the Milky way	
Stars	They produce their own light. They are burning balls of gas	
Planets	Large objects which do not produce their own light. They orbit stars	
Natural satellites	Include moons which can orbit planets	
Artificial satellites	Examples include the International Space Station (ISS) and Hubble Space Telescope, they are man made structures which can orbit planets	