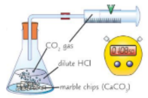
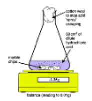
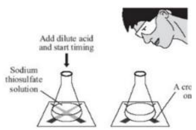
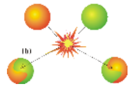
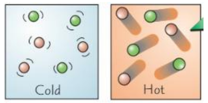
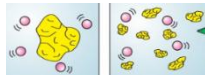
2.1 – Chemical Equations

Reactants	Substances which **react together**. Found on **left** side of equation.
Products	Substances **produced** in a reaction. Found on **right** side of equation.
Word Equation	Uses **names** of **substances**. e.g. iron + oxygen -> iron oxide
Symbol Equation	Uses **chemical formulas** of **substances**. e.g. 4 Fe + 3 O_2 -> 2 Fe_2O_3
Balancing Symbol Equations	Must be the **same number** of **atoms** of each **element** on **each side** of the **equation**. Balance equations by putting **large numbers** in front of formulas.
Conservation of Mass	**Mass** is **conserved** (stays the **same**) in a **reaction**. **No atoms** are **lost** or **made**. Total **mass** of **reactants** = total **mass** of **products**.

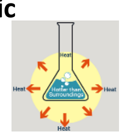
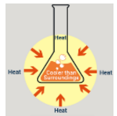
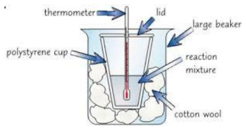
2.2 – Measuring Rate of Reaction

Rate of Reaction	How **quickly** a **reaction happens**. **Measure** how **quickly** the **reactants** are **used up** or the **products** are **formed**.
Gas Syringe Method 	Use if a **gas** is **produced**.
	Add **reactants** to a **conical flask**. Connect **rubber bung** and **gas syringe**. Start **stopwatch**. Measure **volume** of **gas** produced at **regular time intervals**.
Mass Loss Method 	Use if a **gas** is **produced**.
	Add **reactants** to a **conical flask** on a **mass balance**. Start **stopwatch**. Measure **loss** of **mass** at **regular time intervals**.
Disappearing Cross Method 	Use if a **solid precipitate** is **produced** which turns mixture from **transparent** to **opaque.**
	Add **reactants** to a **conical flask** on **paper** with a **black cross**. Start **stopwatch**. **Time** how long it takes for **cross** to **disappear.**

2.3 – Factors Affecting Rate of Reaction

Collision Theory 	For **two particles** to **react,** they must **collide** and must have **sufficient energy** to make the collision **successful**. More frequent collisions = faster rate of reaction.
Temperature 	**Higher temperature** = **faster rate** of **reaction**.
	Particles have **more energy** so **move faster** and **collide more frequently**.
Concentration  Low conc. High conc.	**Higher concentration** = **faster rate** of **reaction**.
	More particles in the **same volume** so **more frequent collisions**.
Surface Area  Low S.A. High S.A.	**Smaller pieces of solid** = **larger surface area** = **faster rate** of **reaction**.
	More solid particles are **exposed** so **more frequent collisions**.
Catalysts	A substance which **increases** the **rate** of a **reaction** but does **not** get **used up** in the reaction.

2.4 – Exothermic and Endothermic Reactions

Exothermic Reactions 	**Transfers energy to** the **surroundings**.
	Causes an **increase** in **temperature**.
	Examples – **combustion**, **respiration** and **neutralisation**.
Endothermic Reactions 	**Takes in energy** from the **surroundings**.
	Causes a **decrease** in **temperature**.
	Examples – **thermal decomposition**, **photosynthesis** and **ice packs**.
Investigating Reactions 	Add **reactants** to an **insulated container** to reduce **heat loss** to the **surroundings**.
	Use a **thermometer** to measure **temperature** at the **start** and **end** of the reaction.
	Temperature increase = **exothermic** **Temperature decrease** = **endothermic**

Y8 Science Cycle 2 - Sheet 2
Chemical Reactions