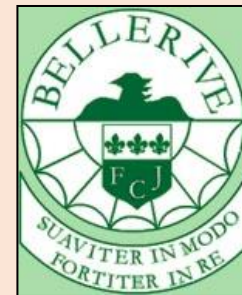


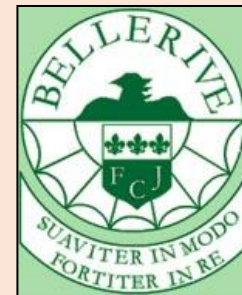
Lesson 1 –



Key points to learn:

- In a chemical reaction atoms are not created or destroyed.
- In a chemical reaction bonds get broken and made when reactants form products.
- In a chemical reaction the mass of the products is always the same as the reactants – this is the Law of Conservation of Mass.
- Sometimes the mass in a reaction appears to decrease – this is because a gas is given off.
- Sometimes the mass in a reaction appears to increase – this is usually because a reactant combines with a gas.

Lesson 2 + 3 –



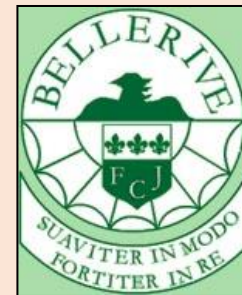
Key points to learn:

- Each element and compound has its own fixed formula.
- A chemical reaction can be represented by a word equation.

Reactants → Products

- A chemical reaction can be represented by a symbol equation.
- In a symbol equation the total number of atoms on either side of the arrow is the same (a balanced equation).
- When balancing a symbol equation you can only put numbers in front of the formula of elements or compounds

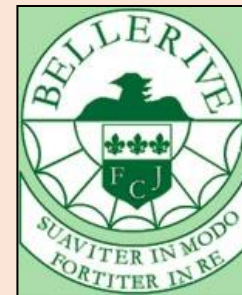
Lesson 4 –



Key points to learn:

- Combustion is a type of chemical reaction where a substance reacts with oxygen. Light and heat energy are given off.
- Combustion is an example of oxidation. Oxidation is when a substance reacts and combines with oxygen. Oxides are formed.
- When fuels are burned completely in the air the products are carbon dioxide and water. Carbon dioxide makes limewater cloudy and water makes cobalt chloride blue.
- Fuels are hydrocarbons. They contain hydrogen and carbon only.

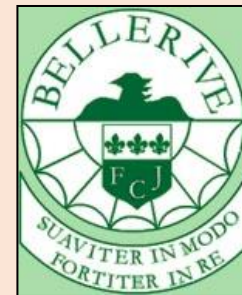
Lesson 5 + 6 –



Key points to learn:

- Gases in the Earth's atmosphere (Greenhouse gases) trap heat energy from the sun helping to keep the Earth warm enough to sustain life (Greenhouse Effect).
- Burning fuels releases more carbon dioxide into the atmosphere. More energy from the sun is trapped and so the Earth is getting warmer – Global Warming.
- Global Warming causes climate change meaning that ice sheets and glaciers are melting, sea levels are rising and there are more storms, floods and droughts.
- Scientists use computer modelling to predict temperatures in the future and core samples to work out temperatures in the past.

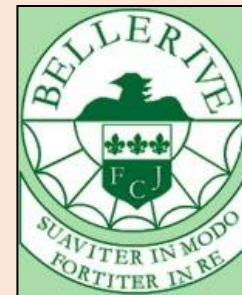
Lesson 7 –



Key points to learn:

- Chemical reactions take in and give out energy
- Exothermic reactions give out heat to the surroundings
- Endothermic reactions take in heat from the surroundings
- Exothermic reactions have a range of different applications such as hand warmers and self heating cans
- Endothermic reactions have a range of different applications such as sports injury packs
- In reversible reactions, if the forward reaction is exothermic then the backwards reaction is endothermic

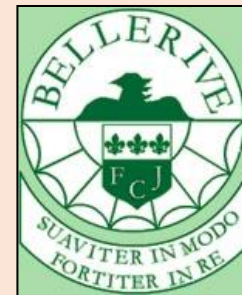
Lesson 8 –



Key points to learn:

- Chemical reactions can be speeded up by increasing the temperature, concentration or surface area of reactants.
- Catalysts can also be used to increase the rate of reaction. Catalysts speed up chemical reactions without being changed or used up.
- Chemical reactions need energy to get started (activation energy). Catalysts lower the activation energy, meaning they can be done at lower temperatures. This makes the reaction cheaper, faster and less fuel is needed (less carbon dioxide is produced).
- Catalysts are used in many industrial reactions like making margarine, fertilisers and in catalytic converters in car exhausts (to remove pollutants).

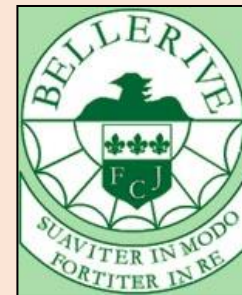
Lesson 9 –



Key points to learn:

- Materials have many properties that make them useful. These include strength, malleability, density and conductivity
- Polymers are long chain molecules made by joining many small molecules called monomers together
- Polymers are low density, flexible, strong, waterproof and easily moulded
- Different polymers have different properties and so they have many different uses
- Polymers can be man made (synthetic) like polythene or natural like wool

Lesson 10 –



Key points to learn:

- Ceramics are made by heating clay or sand
- Ceramics include glass, porcelain and bone china
- Ceramics are insulators of heat and electricity. They are hard and brittle (they are not flexible). They are stiff (they can withstand strong forces before they break)
- Composites are made from different materials
- Composites combine the properties of the materials they are made from to make them more useful. Examples include fibreglass, Kevlar and reinforced concrete