**What You Need to Know - Types of chemical reactions**

**Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed.**

1. **Recall that all matter is composed of atoms and has mass**.
2. **Identify a range of compounds using their common names and chemical formulae.**
3. **Classify compounds into groups based on common chemical characteristics**
4. Acids and bases
* classify acids and bases based on their chemical characteristics.
* describe the pH scale as a way of measuring the acidity and basicity of a substance.
* describe the role of an indicator
1. **Investigate a range of types of important chemical reactions that occur in non-living systems and involve energy transfer, including:**
* **the reaction of acids including metals and carbonates**
* **precipitation**
* **neutralisation**
1. identify the products when an acid reacts with metals, carbonates and metal hydroxides.
2. describe tests which can be performed to determine the production of oxygen, hydrogen and carbon dioxide gas.
3. define a precipitate and identify its formation.
4. **Identify some examples of important chemical reactions that occur in living systems and involve energy transfer, including respiration and reactions involving acids such as occur during digestion.**
5. write the word equation for respiration.
6. **Construct word equations from observations and written descriptions of a range of chemical reactions.**
7. Write word equations for reactions between:
* acids and metals
* acids and carbonates
* acids and metal hydroxides
1. **Deduce that new substances are formed during chemical reactions by rearranging atoms rather than creating or destroying them.**
2. define a chemical reaction and how it differs from a physical change.
3. recall the conservation of matter.

**Different types of chemical reactions are used to produce a range of products and can occur at different rates and involve energy transfer.**

1. **Identify that chemical reactions involve energy transfer and can be exothermic or endothermic**
2. **Compare combustion and respiration as types of chemical reactions that release energy but occur at different rates.**
3. **Describe the effects of factors on the rate of some common chemical reactions.**
4. Plan a first-hand investigation and gather secondary information to describe the effect of the following factors on the rate of reaction:
* Temperature
* Particle size
* Concentration
* Catalysts
1. **Analyse how social, ethical and environmental considerations can influence decisions about scientific research related to the development and production of new materials**
2. **Describe examples to show where advances in science and/or emerging science and technologies significantly affect people's lives, including generating new career opportunities in areas of chemical science such as biochemistry and industrial chemistry.**