Jewellery Design MYP Assessment

By Shahadat Ullah

Designers have a lot to think about when designing jewellery, if the properties are suitable for this. Gold, silver and platinum are the most common. This is because their properties are appropriate for designing jewellery. Titanium and stainless steel are used in jewellery as well.

Elements, Compounds and Mixtures

An element is a substance that is form by one substance, and cannot be broken down into simpler substances. Hydrogen (H), helium (He), Carbon (C), nitrogen (N) and oxygen (O) are all elements.

Compounds are formed by different elements. For example, 2 hydrogen atoms and 1 oxygen atom form a compound called hydrogen oxide (H_2O). The symbol in brackets shows the symbol and the chemical formula. H_2 means 2 hydrogen atoms and O means 1 oxygen atom, this is usually in alphabetical order. Another example is carbon dioxide (CO_2). 1 carbon atom and 2 oxygen atoms. Also, if there is a number to the right of a letter, the number shows how many atoms of that element there is.

A mixture in chemistry is a combination of different elements and compounds with some not chemically joined together, such as air, salt water and river water.

Pure Metals and Alloys

Pure metals are metals that have not been chemically joined to another substance. Elements such as gold, copper, platinum, iron, silver, zinc etc. are all pure metals. Alloys are a compound of multiple elements, one of which is a metal. This means some properties are more useful than pure metals.

For instance, pure gold, platinum and silver are not suitable for jewellery because they are too soft. Therefore, other substances such as nickel, copper, palladium, zinc can be chemically joined with them to form an alloy, which is better for making jewellery. Pure gold, platinum and silver are malleable, meaning they can be pressed into a different shape without breaking, as they are softer than an alloy. The final reason why gold, platinum and silver are used in jewellery because they are highly unreactive metals, that may react with strong oxidizing acids such as nitric acid and hydrochloric acid. Metals such as nickel, cobalt, iron and zinc are reactive with steam, consequently, they are not appropriate for jewellery.

Alloys are more suitable for jewellery than pure metals. Gold that contains 10 carats – 20 carats is suitable for jewellery. Sterling silver is an alloy of sliver containing 92.5% silver and 7.5% other metals, usually copper, that is commonly used in jewellery, whereas, platinum alloys consist of 90-95% pure. Stainless steel and bronze are useful for jewellery, they don't rust easily as well.

Gemstones

Gemstones are mineral crystals which are cut and polished for jewellery and fashion. There are three main aspects of a gemstone that decide how important it is. Beauty, rarity and durability. Diamonds are the most durable gemstones by far (10 on the Mohs scale) and they are extremely beautiful. The problem with this is that it is very rare and expensive. Emeralds have a 7.5-8 on the Mohs scale, a beautiful shape and colour, but is quite rare. Sapphire is an elegant blue colour, with a 9 durability on the Mohs scale. Ruby is very similar except it is a dark red colour. It is also very durable (9 on the Mohs scale). These 4 gemstones are considered 'the precious ones'.

I think ruby and sapphire could be a good option, there are many different colours, the durability is high enough and is not as rare as diamond, and it is still beautiful to the eye.

Jewellery

For my pieces of jewellery, I will use the sterling silver alloy, because it can be pressed into shape, as it is malleable. It is also very unreactive, and does not rust easily. I will also use some gold (15 carats) for decoration, which has very similar properties to the silver, these properties make it appropriate for jewellery. For the gem, I will use different colours of ruby and sapphire. They have a high durability, so they won't wear away so easily.