Paints and Pigments

Introduction

Paint is used to protect, decorate (such as adding colour), or add functionality to an object or surface by covering it with a pigmented coating. An example of decoration is to add festive trim to a room interior. An example of added functionality is to modify light reflection or heat radiation of a surface.

Paint can be applied to almost any kind of object. It is used, among many other uses, in the production of art, in industrial coating, as a driving aid (road surface marking), or as a barrier to prevent corrosion or water damage.

Paints are created by using a pigment, solvent and a binder. The pigment provides the colours we see in paints, the solvent allows the paint to be applied to surfaces and the binder is what makes the paint sticky, so it will actually stick to the surface it is being applied to.

Within this practical you are going to investigate a variety of different pigments and dyes, and also make your own paints.

Practical

Pigments and Dyes:

- In front of you, you will see 4 different coloured powders. Add water to each of the 4 containers. What do you notice is the difference between the powders? Which of the powders is a dye and which are pigments?

- Why can we not use pigments to dye our clothes? How did people colour their clothes before synthetic dyes were readily available?

- Take two pieces of cotton textile. Make up a synthetic dye, by adding water to a powdered dye in a suitable sample container, and place one piece of the cotton into it.

- Next, take some "berries" and crush these up in another container until there is plenty of juice. Next add the second piece of cotton and leave for 10 minutes.

- Take out both pieces of cotton and leave to dry for 10 minutes. Which dye has worked the best? What are the advantages of using synthetic dyes over natural dyes?

Thermochromic Paints

- Watch the demonstration: What happens to the mug as the hot water is placed into it?

- What other uses could there be for this type of pigment?

- Creating your own thermochromic paint:

    o Take a suitable container and add to it some acrylic base (about 2 spoonfuls).

    o Next add 1 spoonful of powder paint to the acrylic base. (This will be the colour your paint will change to when you heat it).

    o Take some of the thermochromic pigment and add this to mixture. (The thermochromic pigment will give the paint its colour you see before adding heat).

    o Add some water and shake thoroughly.

    o The paint is now ready to use. Paint and then apply heat and watch the colour changes!

- In the process of making the paint, can you identify what was used for the solvent and the binder?

- What other combinations of colours could you use to extend the colour range of thermochromic pigments?