Scheme of work unit  
Light (visible spectrum)

National Curriculum link
Energy can be transferred usefully, stored, or dissipated, but cannot be created destroyed.

Learning outcomes
Describe the change in colours of a painted mug in terms of absorbed and reflected light.

Introduction notes
THERMOCROMIC paint is a relatively recent development in the area of colour-changing pigments. After absorbing a certain amount of HEAT, the crystal or molecular structure of the pigment reversibly changes. It then absorbs and reflects light at a different wavelength (hence a different colour) than at lower temperatures.

Thermochromic paints are seen quite often as a coating on coffee mugs, whereby once hot coffee is poured into the mugs, the thermochromic paint absorbs the heat and becomes colored or transparent, thus changing the appearance of the mug.

Suggested Lesson Plan:

Starter
Discuss why we see the world in colour (spectrum of light, white light, some colours are absorbed some colours are reflected depending on their wavelength)

Demo heating up one mug to show change in colour. Explain what happens.

Possibility to link to an investigation: How could they prove that it is the heat that causes the colour change and not the air blowing on the cup?

Main Activity
Students paint a mug using thermochromic paint

Plenary
What are photochromic paints? Predict what would cause this kind of paint to change colour.

Could be used as a research activity (part of main activity if computers are available in the room)
Resources required:

- Bisque pottery (one per person) [www.bisqueuk.com](http://www.bisqueuk.com)
- Thermochromic paint
- Acrylic base
- Glow-in-the-dark paints
- Paintbrushes
- Example mug
- Heat gun (hair dryer)

Health and Safety
This pottery is unglazed; it cannot be used for the consumption of food or drink.
A coat of varnish can be applied to improve durability of all items.

Further Work
Research other uses of thermochromic paints and other kinds of paints and how they work.

Answers:

1- As used
2- Some colours are absorbed i.e. all of the colours of the spectrum except the one they can see reflected.