

# WARMING IT UP USING SOLAR ENERGY

## Teacher-led Activity

The colour of a surface has varying abilities to absorb or reflect solar energy (heat and light). Black absorbs solar energy very well and white reflects solar energy. In this sensory activity students will investigate the use of different colours to absorb solar energy and warm biscuits up.

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## INTENDED LEARNING OUTCOMES

Students will:

- recognise that solar energy can be converted to heat
- recognise that colours absorb solar energy differently
- identify which colour absorbs the solar energy most effectively.

## WHAT YOU NEED

- A packet of chocolate biscuits (we recommend using chocolate chip biscuits as they will make less of a mess).
- A4 size paper in three different colours - white, red, black.
- the [Investigation Record Sheet](#).

## FOCUS

Do you think that some colour paper will get "hotter" in the sun than others? Why or why not?

## MANAGING THE ACTIVITY

### Scenario

We all know the story of Little Red Riding Hood. Little Red Riding Hood was on her way to her Grandma's house with a basket of biscuits. Grandma's house doesn't have electricity. Grandma likes warm biscuits. How will Little Red Riding Hood warm up the biscuits when she gets to Grandma's house?

- Choose a sunny day.
- Introduce the different coloured paper. Ask the students to predict which colour will warm the biscuits up the most and to provide reasons.

- Ask the students to record their predictions on the [Investigation Record Sheet](#).
- Divide the students into four groups. Give each group three biscuits and three A4 size pieces of paper (white, red, black) to experiment with.
- Each group will wrap one biscuit in each piece of paper. Place all the packages in the same sheltered sunny area.
- Leave the biscuits for an hour around midday.
- In groups, open the biscuits at the same time. Touch the biscuits for warmth and observe whether the chocolate has melted. Ask the students to record their observations on the [Investigation Record Sheet](#).

## REFLECTION

- Ask the students to compare their predictions with their observations.
- As a class, discuss the observations. Discuss any differences in observations and why these might have occurred.
- On which colour paper did the biscuit get the warmest? Why do you think that might be?
- What is the relationship between paper colour and absorption of solar energy?

## EXTENSION

- Repeat the experiment with different types of materials, for example, aluminium foil, cloth, and cardboard.
- Make a pizza box solar oven. See [What's Cooking with Solar](#) activity.
- Invent ways of heating water through solar energy. For example, make a solar shower.

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## SUPPORTING RESOURCES

- Watts On Your Mind?  
Solar energy educational activities.  
<http://www.wattsonschoools.com/activities.htm>

## INVESTIGATION RECORD SHEET

### PREDICTIONS

PREDICTIONS	WHITE PAPER	RED PAPER	BLACK PAPER
The biscuit won't warm up			
The biscuit will warm up			
The chocolate chips will melt			

### OBSERVATIONS

OBSERVATIONS	WHITE PAPER	RED PAPER	BLACK PAPER
The biscuit isn't warm			
The biscuit is warm			
The chocolate chips melted			

I predicted that the \_\_\_\_\_ would warm the biscuit up the most.

I found out that the \_\_\_\_\_ warmed the biscuit up the most because

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