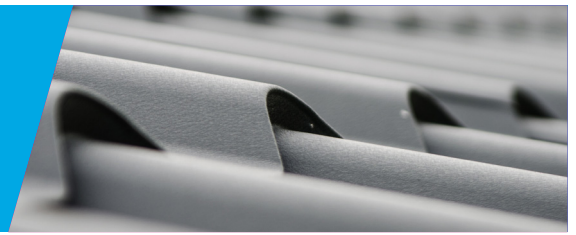


CURIOSITY AT HOME

KEEPING IT COOL



We use energy to do everyday things like cook dinner, drive cars and keep our homes cool in the summer. Much of our energy comes from burning fossil fuels, like coal and gasoline, which puts carbon dioxide and pollutants in our atmosphere. To reduce our impact on the environment, energy engineers look for ways to reduce the amount of energy we use. One of their challenges is to design buildings that require less energy to heat and cool. Could the color we paint our roofs affects how much energy we use trying to keep our houses cool in the summer? Follow the activity below to find out!

MATERIALS

- Black construction paper
- White paper
- Sunlight or incandescent lamp (any light bulb that gets hot when turned on)
- Science notebook or paper
- Something to write with
- **Optional (for older students):**
 - Thermometer
 - Two bottles or jars (same size)
 - Tape
 - Water

PROCEDURE

- Place a piece of black paper and a piece of white paper in direct sunlight or under the lamp and turn it on.
- Make a prediction: What color paper will heat up faster? What makes you think that? Record your prediction in your science notebook.

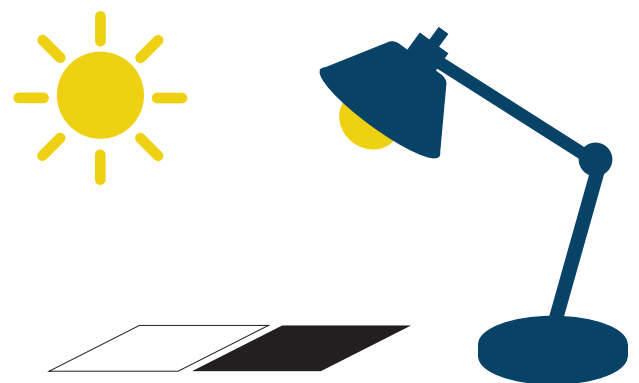
Experiment continued on next page...



Solar Panels



Green Roof



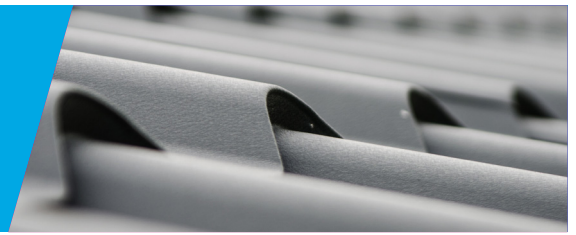
Show us how you're being curious! Share your results with us.

PACIFIC
SCIENCE
CENTER



CURIOSITY AT HOME

KEEPING IT COOL



PROCEDURE *continued...*

- After 15 minutes, feel the temperature of both papers.
- Do they feel the same temperature? Which color feels warmer? Record your results in your science notebook.
- To test your results without bias, perform a “blind test.” Ask a friend or family member to close their eyes and feel the two papers, without telling them which paper is which. Ask them which paper feels warmer.



Feel the temperature of both papers

WHAT'S HAPPENING

Materials that are white reflect light and heat, while materials that are black absorb them. Energy engineers have found that by building homes with white roofs instead of the traditional black, residents spend up to 20% less on air conditioning to keep their homes cool!

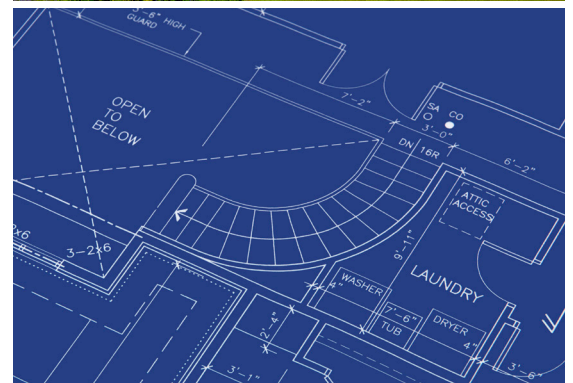


DID YOU KNOW?

Energy engineers have developed a special material that can be added to any color paint to make it reflect more sunlight, thereby keeping a building cooler no matter what color you want it to be!

EXPLORE MORE

- Imagine you were designing an energy efficient home for someone who lives in a hot, sunny place. What materials would you use? What colors would you paint it? What other features might you include? Draw a picture of your design and include labels explaining your design choices. Now imagine that you had to design an energy efficient home for someone who lives in a cool, rainy place. What features of your design would you keep? What would you change?
- Another way that energy engineers reduce energy consumption is by designing building with “green roofs.” A “green roof” is a roof that is completely or partially covered with plants, growing on top of a waterproof layer. Design a green roof for a home in your neighborhood and draw it in your science notebook. Now imagine that you’re making a green roof for your school building. How would you redesign your drawing for your school’s roof?



Show us how you're being curious! Share your results with us.



CURIOSITY AT HOME

KEEPING IT COOL



3–5 GRADE EXPLORATION

Explore the following questions and write your observations in your science notebook.

- Record your prediction about which color paper will heat up faster. Explain your reasoning.

I predict that _____

because _____

- After 15 minutes, compare the temperature of both pieces of paper. Record your observations in the chart below, or in your science notebook.
- Perform two “blind tests.” Ask a friend or family member to close their eyes and feel the two papers, without telling them which paper is which. Ask them which paper feels warmer. Record your observations in the chart below, or in your science notebook.

	Black Paper	White Paper
Your Observations		
Blind Test #1		
Blind Test #2		

Experiment continued on next page...

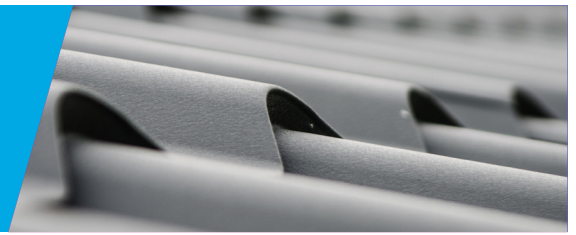


Show us how you're being curious! Share your results with us.



CURIOSITY AT HOME

KEEPING IT COOL



3–5 GRADE EXPLORATION *continued...*

Different types of materials reflect more or less light and heat. Find two similarly shaped objects that are the same color but made out of different material. Repeat the experiment above. Which material feels warmer after 15 minutes? Record your observations in the table below, or in your science notebook.

	Material A: _____	Material B: _____
Your Observations		
Blind Test #1		
Blind Test #2		



Show us how you're being curious! Share your results with us.

PACIFIC
SCIENCE
CENTER

