

# Taking In The Heat

## Amount of Heat Absorbed

*Developers:*

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*Grade Level:*

1<sup>st</sup> (Adaptable K through 3)

*Discipline:*

Weather, Temperature, Heat Absorption with different materials

*Goal:*

Students will learn through the scientific process that different textured materials can absorb more heat than others.

*Objectives:*

1. Students will understand how a thermometer can be used to measure the amount of heat absorbed into cotton, nylon, fake fur and terry.
2. Students will begin to discover the concepts of time (hour), the position of clock numbers, the movement of clock hands for each hour.
3. Students will learn that graphs can be used to show pictures of heat differences.
4. Students will learn that some materials absorb more heat than others.
5. Students can utilize verbal and written means to report results.

*Background:*

The sun gives us heat and light. Heat can change the form of some things. Most matter expands when it is heated and contracts when it is cooled. Liquids expand when heated and contract when cooled. Air temperature is the amount of heat in the air. It can be measured with a thermometer. The warm air spreads to warm the substance inside the thermometer. The substance expands as it is heated.

(Teacher hint: Large group and small group discussions, observations and experiences about different materials the children use in different seasons can enrich children's experiences. Let the children model different fabrics used inside and outside in different seasons. Good show and tell activity.)

*Vocabulary:*

thermometer  
temperature  
materials

*Literature:*

Gibbons, Gail	Weather Words and What They Mean
Maestro, Betsy	Temperature and You
	Through the Year With Harriet
Mollet, Telowa M.	A Promise to the Sun
Rodgers, Paul	What Will the Weather Be Like Today?
Tresselt, Alvin K.	Sun Up

*Materials:*

1. Five thermometers.  
*Early childhood hint:* With young children it is best to use Enviro-Safe<sup>R</sup> Thermometers (non mercury).
2. Four pieces of material sewed into rectangular sacks with one side open. The four pieces of material should be cotton, nylon, fake fur and terry, all white or the same color.
3. Premade graphing sheets.
4. A sunny area in a classroom.
5. Strips of colored oak tag (1/4" x 6") - red, yellow, purple, green and black.  
*Early childhood hint:* Since children are just learning to read thermometers, mount each thermometer on a strip of oak tag 1" x 10" long. (Make sure all oak tag is the same color.)
6. Timer and model clocks.

*Procedure:*

1. Lay out the four different material sacks so that each one gets the same amount of sun.
2. Insert a thermometer in each sack.
3. Place the edge of the opening at the 0<sup>0</sup> C mark of the thermometer.
4. Let them sit for one hour in the sun. (Use model clock to show start/finish).
5. Remove thermometers and read temperature.  
*Early childhood hint:* Since children are learning to read thermometers, measure temperature by drawing a line next to the top of the green mercury.
6. Place the reading on your graph making sure the 0<sup>0</sup>C is on the 0<sup>0</sup>C line.
7. Compare/Contrast.
8. Write which material absorbs the most heat or write whatever the graph tells them.

*Management (for early childhood):*

1. Teacher demonstrates the experiment to the whole class first.
2. Then small mixed ability groups (4) will work at learning centers.
3. Before sending groups to learning centers, teacher can summarize experiment by "reading" the directions at the learning center.



*Extension Questions:*

6. Which material would be best for summer?  
Which material would be best for winter?
7. Which material would you wear in Alaska?  
Which material would you wear in Hawaii?
8. Would the same materials in different colors give us the same results?

# Take the Heat

## Which material absorbs the most heat?

Amount  
of  
Water  
Melted

Cotton  
Red

Nylon  
Yellow

Fake Fur  
Purple

Terry  
Green

Control  
Black

Which material keeps the "Cool" in the most?

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