

Connections to School —

NPASS2 after school projects are relaxed, informal and fun. All of the projects stress five common process skills that are important for learning science: observing, investigating, questioning, explaining and problem-solving. Children also gain hands-on experience with important ideas they will learn in school. In Heating a House and an Oven these ideas include heat, cold, temperature, reflection, radiation, convection, conduction, insulation, energy and melting.

NPASS Master Student Attributes

NPASS₂
National Partnerships for After School Science
MASTER OBSERVER

Looks at the big picture
Examines details
Keeps record



Stand back to see how things fit together AND ALSO look carefully at the details.
Make notes, lists, charts, sketches or drawings so you can check your observations later.

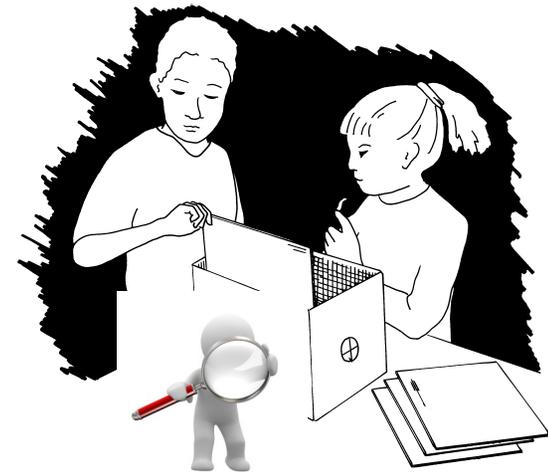
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<http://npass2.edc.org>



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Making Science Fun

Heating a House and an Oven: an after school science and engineering project



In this project children explore the concept of heat transfer by building a cardboard box house and heating it with a light bulb.



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FOR PARENTS

Summary

Students explore the concepts of hot, cold and temperature by reading temperatures in the room. They gain first hand experience with heat transfer by building a cardboard box house, heating it with a light bulb and observing temperature changes. Insulation is added to the house to reduce heat loss, and then houses are converted into ovens where it is possible to bake cookies.

Activities

Heating a House and an Oven activities include:

- Read the Temperatures
- Make a House; Make It Warm
- Insulate Your House
- Keep Things Cold

Materials

- | | |
|--------------------------|--------------------------|
| Cardboard boxes | Newspaper for insulation |
| Candy Thermometer | Alcohol thermometer |
| 40-W & 100-W light bulbs | Two prong bulb holder |
| Extension cord | Aluminum foil |
| Aluminum pan | Ice cubes |
| Cookie dough | Oven mitts |
| 12" BBQ skewers | |

Questioning

Ask these types of questions as your child explores the concepts at home:

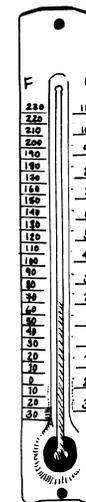
- How many different temperatures exist in one room? Why?
- What is the temperature of a fresh ice cube? When it is half melted? When it is almost all melted?
- How are real houses heated? How do they lose heat?
- Why does a "real" oven work so well?

FOR KIDS

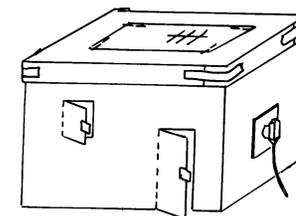
Explore these challenges using materials you have at home. If you have access to a thermometer try:

Predict temperatures before you measure them:

- inside the refrigerator
- cold tap water
- find the coldest place in your house
- find the warmest place in your house
(For your safety—DO NOT use an oven)



Explain to an adult how your group heated its model house. How did you increase the temperature of the house?



Explain the difference between heat and temperature.

Describe what your group baked (if anything) and how it turned out.

