Heat & Chemical Energy

Investigation Data Sheet

Make A Calorimeter

Chemical energy, measured in Calories, is packed away in each kind of food in different amounts. We can measure this energy by making a device called a calorimeter and determining how many Calories it contains.

Objective

Create a simple calorimeter to measure the energy contained in a peanut.

Materials

__ a few unsalted peanuts
__ a needle
__ a cork
__ a large metal coffee can with both ends removed
__ a smaller metal can with only one end removed (it should be small enough to fit inside the larger can)
__ a large nail
__ a hammer
__ a metal barbecue skewer
__ 100 milliliters of water
__ a thermometer
__ matches
__ a cookie sheet
__ an adult

Safety Notice: All applicable laboratory safety rules must be followed. Students should not perform any experimental activity without the teacher's supervision and express permission. Students must follow safety guidelines and wear appropriate protective gear.

Procedure

1. Carefully push the eye of the needle into the smaller end of the cork.
2. Push the pointed end of the needle into a peanut.
3. With great caution, poke a bunch of holes all around the bottom of the large coffee can. The holes will act like a chimney.
4. Carefully punch two holes exactly opposite each other near the top of the small can.
5. Slide the barbecue skewer through the two holes.
6. Pour 100 milliliters of water into the small can along with the thermometer.
7. Make a note of the temperature of the water.
8. Place the cork and peanut on the cookie sheet and have an adult use the matches to light the peanut.
9. As soon as the peanut is lit, have an adult put the large coffee can around the burning peanut.
10. Balance the skewer and the small can of water on the big can and wait for the peanut to stop burning.
11. While you wait, check the thermometer again and record the temperature. Has it increased?

Conclusions

- A Calorie is the unit equal to the amount of heat required to raise the temperature of 1 kilogram of water by 1°Celsius. Based on this, give an estimate of how many Calories you think your peanut contained. How could you determine the exact amount?

	Temperature
Time	