

Background:

1. What is energy?
2. What does your body use to get energy to do what you need to do?
3. Coal, gas, and wood are also energy sources. What kind of energy do we get directly from these three energy sources?
4. We can convert the energy from coal, gas, and wood into another form of energy that is much easier for us to use to do work. What is this other form of energy?
5. When scientists measure heat energy, they used units called calories. How much heat energy is in one calorie?
6. How do you compute how many calories something has?
7. How will we be testing a cheeto for its energy content?
8. Calories are listed on most food packages. How is a food calorie different from the "chemistry" calories you will be measuring?

Procedure and data:

1. As instructed, with the match light the cheese ball.
What did you observe that shows cheetos have energy? (1/2 point)
2. From what you saw how many calories do you think is in the cheeto? Estimate! (1/2 point)
3. Now follow the procedure in number 7 to test the cheeto for its calories.
What is the temperature of the water **before** you have burned the cheeto? (1/2 point)
4. What is the temperature of the water **after** you burned the cheeto? (1/2 point)
5. How many calories did your cheeto have? Do the math calculation. (See number 6 above for help.)
(1 point)
6. Do you think that the cheeto released all of its energy? (1/4 point)
Why or why not? (1/2 point)

7. The water didn't absorb all the energy from the cheeto. Because of this we didn't get a totally accurate measurement of the calories in the cheese ball. Where did some of the energy go? (1/2 point)
8. What do energy drinks and energy bars contain that provide energy for people who consume them? (1/2 point)
9. Is water food? (1/4 point) Why or why not? (1/2 point)

Photosynthesis:

1. How do you get the **building materials** your body needs to grow, change, repair damage, and replace things like skin, hair and fingernails? (1/2 point)
2. How do you get the **energy** you need to move and do all the other things you need to do? (1/2 point)
3. Plants don't eat food. How do plants get the **building materials** they need to grow, change, repair damage and replace parts and the **energy** they need to do the things they do? (1/2 point)
4. Here is an experimental design carried out to find out what plants need to get energy.
 - Five hundred grams of bean seeds were planted in each of six planting containers filled with clean, dry sand. One gram of dry fertilizer was added to the sand in each planter.
 - The six planters were placed in six identical environment chambers where water, light, and air – oxygen (O₂), carbon dioxide (CO₂), and nitrogen (N₂) – could be controlled.
 - After three weeks the seeds or plants were collected, dried, and weighed. The conditions and results of the experiment are recorded in the chart below.

Find the **change in mass** for each experiment. Fill this in in the data table. (1 point)

	Water	Light	O ₂	CO ₂	N ₂	Starting mass	Ending mass	Mass change
Environment A	Yes	Yes	Yes	Yes	Yes	500 g	551 g	
Environment B	Yes	Yes	Yes	Yes	No	500 g	552 g	
Environment C	Yes	Yes	Yes	No	Yes	500 g	500 g	
Environment D	Yes	Yes	No	Yes	Yes	500 g	549 g	
Environment E	Yes	No	Yes	Yes	Yes	500 g	500 g	
Environment F	NO	Yes	Yes	Yes	Yes	500 g	500 g	

5. Did the beans grow and produce food when all five factors were present? (1/2 point)
6. Were all of the factors needed for the beans to grow and produce food? (1/2 point)
7. What factors do plants need to produce food? (1 point)
8. The food that the plants produce is glucose. How is glucose used by plants? (1 point)
9. What are at least four parts of plants that animals can use for food? (1 point)