



Stayin' Alive!

Every second of your life, your body's trillions of cells take in, use, and store energy. They repair themselves, reproduce, and get rid of waste. Together, these processes are called *metabolism*. In many ways, your body's overall metabolism is very similar to that of an individual cell. Each cell needs energy on a small scale so all your cells together require energy on a larger scale. Your cells use the food that you eat to provide the energy you need to stay alive.

Your Basal Metabolic Rate (BMR) is a measurement of the energy that your body needs to carry out all the basic life processes while you are at rest. These processes include keeping your heart beating, breathing, and keeping your body's temperature stable. Your BMR is influenced by your gender, your age, and many other things. Your BMR may be different from everyone else's, but it is normal for you. In this activity, you will find the amount of energy, measured in Calories, you need every day in order to stay alive.

MATERIALS

- bathroom scale
- tape measure

SCIENTIFIC METHOD

Procedure

1. Find your weight on a bathroom scale. Convert your weight in pounds (lb) to your mass in kilograms (kg) by multiplying the number of pounds by 0.454.

Write your mass here. _____ kg

2. Use a tape measure and the help of a classmate to find your height. To convert your height in inches (in.) to your height in centimeters (cm), multiply the number of inches by 2.54.

Write your height here. _____ cm

3. Now use your height and mass and the appropriate formula below to calculate your BMR. Your answer will be an estimate of the number of Calories your body needs each day just to stay alive.

Calculating Your BMR

Females	$65 + (10 \times \text{mass in kg}) + (1.8 \times \text{height in cm}) - (4.7 \times \text{age in years})$
Males	$66 + (13.5 \times \text{mass in kg}) + (5 \times \text{height in cm}) - (6.8 \times \text{age in years})$

My BMR = _____ Calories

4. Your metabolism is also influenced by your activities. Talking, walking, and playing games all take more energy than being at rest. Select the lifestyle that best describes yours from the Activities Factors chart on page 32. Then multiply your BMR by the activity factor to get an estimate of the Calories your body needs each day to stay healthy.

Write the estimate here. _____ Calories

Stayin' Alive! continued

Activity Factors

Activity lifestyle	Activity factor
Moderately inactive (normal, everyday activities)	1.3
Moderately active (exercise 3 to 4 times a week)	1.4
Very active (exercise 4 to 6 times a week)	1.6
Extremely active (exercise 6 to 7 times a week)	1.8

Analysis

5. In what way could you compare your whole body to a single cell? Explain.

6. Does an increase in activity increase your BMR? Does an increase in activity increase your need for Calories? Explain your answers.

7. If you are moderately inactive, how many more Calories would you need if you began to exercise every day?

Going Further

The best energy sources are those that supply the correct amount of Calories for your lifestyle and also provide the nutrients you need. Research in the library or on the Internet to find out which kinds of foods are the best energy sources for you. How does your list of best energy sources compare with your diet?

List everything you eat and drink in 1 day. Find out how many Calories are in each item, and find the total number of Calories you have consumed. How does this number of Calories compare with the number of Calories you need each day for all your activities?