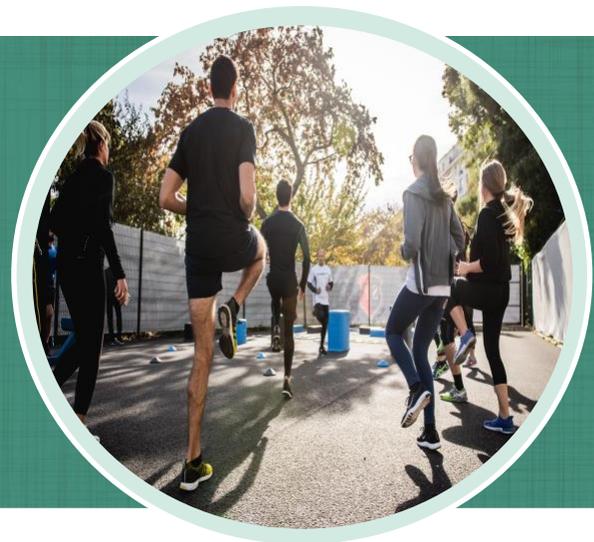


Human Metabolism

Real World Energy
Learner Worksheet
Grade Level: 9-12



Name:

Part 1: Background Questions

Read the food analysis backgrounder and answer the following questions.

1. What is metabolism?

2. What are the two types of metabolic reactions?

3. Name the reaction that is occurring when food is broken down.

4. List at least three factors that affect metabolism and body weight.

5. What is required to maintain a balanced diet?

6. The following charts provide an overview of a week in the life of two different people. They are the same age, height and weight. Their activity level and food intake are different. Review the charts. Then predict the outcomes that will result if the two people continue this weekly profile over five to ten years.

Person 1		Person 2	
Age	22	Age	22
Weight	95 kg (187 lbs)	Weight	95 kg (187 lbs)
Height	1.7 m (5 ft, 8 in)	Height	1.7 m (5 ft, 8 in)
Activity Level	Sedentary (little or no exercise)	Activity Level	Moderately (moderate exercise 3 to 5 days per week)
Base Metabolic Rate (BMR) - daily calories needed to maintain weight	2330	Base Metabolic Rate (BMR) - daily calories needed to maintain weight	3010
Daily Food Intake (calories)	2500	Daily Food Intake (calories)	2800

Part 2: Metabolic Activity in Muscles

Record your observations from your exercise tests in the observation chart below.

Observations Chart:

Time of Measurement	Temperature (°C)
Start	
After 10 minutes of exercise	
5 minutes after exercise	
10 minutes after exercise	
15 minutes after exercise	

Questions:

1. Describe the change of temperature of the muscle before, during and after exercise.

2. What is occurring during metabolic reactions in muscles?

3. If you were to lift a weight of 2 kg and one of 20 kg, what would you expect to see if you measured the temperature change for the different weights?

Calorie Output Chart:

Activity	Time Spent in One Day (mins.) on Each Activity	Calories Per Minute Used (See Table Cal/Min)	Rate of Energy Use (Cal/Min times Min)	Calories Used

Total calories consumed: _____

Total calories used: _____

Questions:

1. Compare the difference between the calorie intake and use. Were they the same? If not, which one was greater?

2. Explain the energy balance.

3. Why is it important to have an energy balance?
