



ACTIVITY #4

EXPENDING ENERGY

It is important to be physically active

In the last section, you learned that our bodies are like cars. Like cars, we require fuel, or energy, in the form of calories, which we get from food. In order to remain at a healthy weight, we need to eat the right number of calories and nutrients. Sometimes we eat too many calories than we need. When that happens, our body stores the excess calories as fat, which we can use later when needed. If we eat too little calories, we may not have enough energy for our daily activities.

You probably know that it is important to have physical activity, which is any body movement that demands more energy than is expended when your body is at rest. In other words, your body uses energy to complete tasks like running, skating, or even cleaning. Physical activity is important because it helps your body become stronger and improve bodily functions. The number of calories used during any activity is known as **energy expenditure**.

Having completed Activity 3, you now know how to estimate the number of calories you need in order to have a healthy body. Now its time to learn how much energy you use while doing different physical activity. We've already learned about activity factors in the TEE equation. In this activity we will learn another estimate called the **Metabolic Equivalent of a Task (MET)**. This is the variable used to help us calculate the amount of energy used during different activities. This

number can differ depending on the activity you are doing. Look at the chart below to see the variable for each task. Note that the harder the task, the higher the variable.

Activity	MET Variable
Sleeping, reading, watching TV	1.0
Playing Video Games	1.5
Playing an Instrument	1.63
Walking, Slowly	2.0
Housework (sweeping, mopping, cutting grass, and cleaning room)	3.0
Walking, Fast	3.0
Bicycling	4.0
Dancing	4.8
Soccer	7.0
Basketball	8.0

Once you find the MET variable for your activity, you can use the equation below to figure out the number of calories you burned while doing that activity.

$$\frac{\text{MET Variable} \times 3.5 \times \text{Weight in Kilograms(kg)}}{200} = \text{Calories used per minute}$$

CHECK YOUR THINKING

Use the reading to find and support your answers.

1. Draw a picture of a stick figure doing a physical activity.
2. Underline the definition of energy expenditure.
3. In the chart above, circle the MET variable for playing an instrument.

LET'S TRY IT TOGETHER

Expending Energy

Here's the Story

Savannah has been going to soccer practice twice a week. She also plays with her neighborhood friends after school. They enjoy riding their bikes, playing at the park, and jumping rope. Savannah wants to know how many calories she uses during different activities.

Let's calculate how many calories Savannah uses while playing soccer for **one minute**.

$$\frac{\text{MET Variable} \times 3.5 \times \text{Weight in kg}}{200} = \text{Calories used per minute}$$

Directions

First, let's identify the MET variable needed for our equation. Underline Savannah's activity in the above paragraph, and then find Savannah's activity in the chart. Circle the MET variable for that activity.

Activity	MET Variable
Sleeping, reading, watching TV	1.0
Playing Video Games	1.5
Playing an Instrument	1.63
Walking, Slowly	2.0
Housework (sweeping, mopping, cutting grass, and cleaning room)	3.0
Walking, Fast	3.0
Bicycling	4.0
Dancing	4.8
Soccer	7.0
Basketball	8.0

Next, we need to calculate Savannah's weight in kilograms. She weighs 110 pounds. We can figure out her weight in kilograms using the following conversion factor: **(Round to the nearest whole number)**

$$1 \text{ lb} = 0.45 \text{ kg}$$

What is Savannah's **weight in kilograms**?

$$110 \text{ lbs} \times 0.45 \text{ kg/lb} = 50 \text{ kg}$$

Last, let's calculate how many calories Savannah **used per minute** playing soccer: **(Round to the nearest whole number)**

$$\text{MET} \times 3.5 \times \text{Weight in kg} \div 200$$

$$\left(\frac{7.0}{200} \right) \times 3.5 \times (50 \text{ kg}) = 6 \text{ calories used per minute}$$

Thinking More Deeply

Can you calculate how many calories Savannah would use if she played soccer for **60 minutes**? Show your work below.

$$6 \text{ calories used per minute} \times 60 \text{ minutes} = 360 \text{ calories used per hour}$$

TRY IT ON YOUR OWN

James normally loves to play football. However, his grandmother gave him a new video game for his birthday, so he has been doing that rather than playing football with his friends. Can you calculate how many calories James uses per minute while playing video games?

Directions

First, identify the MET variable needed for our equation. Underline James' activity in the above paragraph, and then find that activity in the below chart. Circle the MET variable for that activity.

Activity	MET Variable
Sleeping, reading, watching TV	1.0
Playing Video Games	1.5
Playing an Instrument	1.63
Walking, Slowly	2.0
Housework (sweeping, mopping, cutting grass, and cleaning room)	3.0
Walking, Fast	3.0
Bicycling	4.0
Dancing	4.8
Soccer	7.0
Basketball	8.0

Next, calculate James' weight in kilograms. He currently weighs 185 pounds. You can figure out his weight in kilograms using the following conversion factor: **1 lb = 0.45 kg** (Round to the nearest whole number)

Last, calculate how many calories James **used per minute**: (Round to the nearest whole number)

$$(\text{_____}) \times 3.5 \times (\text{_____ kg}) \div 200 = \text{_____}$$

Summarize it

1. What is the MET variable for James' activity?
2. What is James' weight in kilograms?
3. How many calories did James **use per minute**?

Thinking More Deeply

Can you calculate how many calories James would use if he played video games for **120 minutes**. Show your work.

TAKE IT HOME: HOW ABOUT YOU?

Directions

Work with your parent or another adult to do the activity below.

Measurement: You will need a scale to find your weight in lbs.

First, pick one activity from the MET chart below you've done at least once this week. Circle the MET variable for the activity you've chosen.

Activity	MET Variable
Sleeping, reading, watching TV	1.0
Playing Video Games	1.5
Playing an Instrument	1.63
Walking, Slowly	2.0
Housework (sweeping, moping, cutting grass, and cleaning room)	3.0
Walking, Fast	3.0
Bicycling	4.0
Dancing	4.8
Soccer	7.0
Basketball	8.0

Next, calculate your weight in kilograms. You can figure out your weight using the following conversion factor: **1 lb = 0.45 kg** (Round to the nearest whole number)

Last, calculate how many calories you **used per minute doing your selected activity: (Round to the nearest whole number)**

$$(\underline{\hspace{2cm}}) \times 3.5 \times (\underline{\hspace{2cm}} \text{ kg}) \div 200 = \underline{\hspace{2cm}}$$

Summarize it

1. What is the MET variable for your activity?
2. What is your weight in kilograms?
3. How many calories did you **use per minute**?

Think More Deeply

Use your answer from question 3 to calculate how many calories you would use in **30 minutes**. Show your work.