

What Is Energy Balance?

Grade Band: 3-5

Objectives:

Students will:

- Be introduced to the concept of Energy Balance.
- Generate ideas about where energy comes from and how it is used.
- Identify ways that Energy Balance can contribute to an active, healthy lifestyle.
- Play a game to balance calories consumed from foods and beverages with calories used during physical activities.

Materials:

- Beanbags
- Jump ropes
- Balance Scale
- Radio or other Music Source
- Flip Chart
- Calculators
- Pencils and Papers
- Energy In and Energy Out Cards – reproduced and cut out
- Two bags or containers

Time Frame: 1-2 class periods

Instant Expert:

The young people in your class are already beginning to make many important health-related decisions. Giving them tools, information and confidence to make those decisions is an important part of contributing to their healthy lifestyle. One set of tools you can give them relates to their Energy Balance. Energy Balance is the balance of calories consumed from foods and beverages (Energy In) with calories burned from physical activity (like walking, climbing stairs, playing sports or playing at recess playing), activities of daily living (like getting dressed, eating, cleaning your room, raking leaves or reading) and basic body processes, like thinking and sleeping (Energy Out). When we maintain Energy Balance over time, it can contribute to our health in positive ways.

Human beings need energy to survive – to breathe, move, pump blood, and think – and they get this energy from calories in foods and beverages. When a food or beverage contains 100 calories, that is a way of describing how much energy our body gets from eating or drinking it. How many calories we need each day depends on many things: our gender, height, weight, age, and activity level among them. The average school age child needs between 1,600 and 2,500 calories each day. That energy is then used (burned) by the activities we do each day and the basic body processes we need to survive. These include sleeping, thinking, pumping blood, etc.

Maintaining balance between our Energy In and Energy Out contributes to a healthy lifestyle in many ways. Adults often focus on weight gain or loss. (If we consume more calories than we burn, we gain weight. If we burn more calories than we consume, we lose weight.) For children, however, the focus should also be about having enough energy to do all the things they want to do and to grow up strong and healthy; to practice balance, variety and moderation in their diet; and to be physically active for 60 minutes each day.

Our Energy In and our Energy Out don't have to balance exactly every day, but our goal should be to maintain balance over time. Energy balance in children happens when the amount of Energy In and Energy Out supports "normal growth and development" without promoting excess weight gain. In other words, children need to gain some weight as part of their normal growth and development so an exact 1:1 ratio of Energy In and Energy Out is not the goal. What is important for them to understand is the importance of balancing their daily calorie requirements with regular physical activity. Estimated calorie requirements by age and activity level can be found at <http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/downloads/calreqtips.pdf>.

In this lesson, students play a game where they balance food and beverage calories selected from Energy in Cards with calories burned from Energy out Cards. In real life, Energy Out also includes Basal Metabolic Rate (BMR), which is the amount of energy we use for basic body functions like sleeping, breathing, building new red and white blood cells, building muscle tone, and pumping blood throughout the body. However, this game only includes their Energy Out as it relates to physical activity. They will learn more about BMR in Module 3. Energy Balance, of course, doesn't come from one food or one activity but the game will help students begin to understand how food gives us calories (Energy In) and physical activity uses those calories (Energy Out).

Procedure:

Note: Before beginning the lesson, clear a space where students can move around.

1. Tell students that they are going to participate in a series of activities that all have something in common. Their challenge is to try to figure what that is! Have students stand up and complete the following tasks:
 - a. Walk from one side of the room to the other with a beanbag on your head. Try to keep the beanbag on your head the entire time.
 - b. Repeat the beanbag activity using a jump rope as a simulated tightrope. Try to stay on the rope while keeping the beanbag on your head. Repeat the exercise with your eyes closed!
 - c. Remove the beanbag and start the music. Dance in place until the music stops. When it stops, put one foot in the air and hold that position. Try to stay on one foot until the music starts again without placing the other foot on the floor. For an extra challenge, close your eyes!
 - d. Write the following equation on the board: $272+7=$. Ask students to create another equation that would get the same sum, using the number 76 as one of the addends.
 - e. Place an object on one side of a balance scale and challenge students to find another object in the room that would keep the scale even.
2. At the end of the five activities, ask students what all of the activities have in common. The answer is they are all related to “balance.” Ask students to define “balance” and to share how each activity relates to it. Which activities were most challenging? Why?
3. Ask students for other examples of things that can be balanced. *Ideas include a budget, a checkbook, a seesaw, the balance of power, balancing foods from food groups, balancing our time, a balanced news report, even balance in a friendship!* For each example, ask students to share how we get balanced, the benefits of the balance, and the consequences or challenges of being unbalanced. In what ways can things fall apart or not work if they are not balanced?
4. Poll students for examples of how our body stays balanced. Guide the discussion toward food and physical activity and see if students have any idea how food and physical activity can help our body stay balanced.
5. Put the word, “energy” on the board and make a T-chart under it with the headings, “Energy In” on the left and “Energy Out” on the right. Ask students to share definitions for the word, “energy.” (Energy is our ability to do work, be active, play, breathe, and move!)
6. Then ask them to list some things they have done today that they needed energy for. List all ideas on the right side of the T-chart. Then ask them if they know where that energy came from. List all ideas on the left side of the chart.
7. Share that we get energy from what we eat and drink. The energy comes in the form of calories. (You may want to ask students if they have ever heard the term “calorie” and review with them)

that calories are the amount of energy they get from what they eat or drink.) All available energy comes from foods we eat and drink. That is called “Energy In.” We use that energy to do just about everything from the time we wake up to the time we go to sleep. We even use some energy when we’re sleeping! When we use calories/energy to work and play, it’s called burning the calories. That is “Energy Out.”

8. Put the words, “Energy Balance” on top of the T-Chart. Now that they know about Energy In and Energy Out, ask students to guess what the term, “Energy Balance” means and how we can get it! Share information about Energy Balance from the Instant Expert section. Explain to students that Energy In and Energy Out doesn’t have to balance **perfectly** every day but we should try to keep our Energy balanced over time.
9. Now that students have a better idea of what Energy Balance is, tell them you are going to play the Balance Game! (Before the lesson began, you should have cut out the Energy In and Energy Out cards and mixed them up in two separate containers. Divide students into six teams, and give each team a calculator or pencil and paper.)
10. Each team will select a card from the Energy In bag that tells them an imaginary food or beverage and the related number of calories for one serving (Energy In). They then will select a card from the Energy Out bag that tells them an imaginary activity and the related number of calories they would burn if they did it for 30 minutes. (Each card is reflective of calories burned for a 65 lb person.) The team that comes closest to balancing Energy In with Energy Out wins!
11. Once each team has gone, repeat the game but this time have each student choose as many Energy Out cards as they need to balance the calories from their Energy In card. The amounts don’t need to be exact but the team that comes closest to balancing wins. Place the Energy Out cards back in the bag after each team goes.
12. At the end of the lesson, have each student complete this sentence, “Energy Balance is _____.”

Extensions:

- Have student teams create projects that illustrate Energy Balance.

Family Connection:

Have students talk with family members about Energy In at their next family dinner. Then have them brainstorm an activity they could do as a family to “balance it out.”

Community Connection:

Have students write an article for the school or community newspaper that explains Energy Balance and how maintaining it can contribute to an active, healthy lifestyle. Then have them try to get their story included in an upcoming edition!

Standards Connections:

National Health Education Standards

- Standard 4: Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks.
- Standard 5: Students will demonstrate the ability to use decision-making skills to enhance health.

National Reading/Language Arts Standards:

- Standard 5: Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
- Standard 12: Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

National Science Standards

- Life Science
- Science in Personal and Social Perspectives