

LESSON 3: LIVE A BALANCED LIFE

ABOUT THE LESSON

This lesson focuses on the importance of energy balance. There are three Add variations in the lesson:

- ***Being in Balance*** presents a general overview of energy intake vs. output and introduces the concept of energy density
- ***Portion Distortion*** focuses on the difference between recommended serving size and actual portions consumed
- ***Get a Move On!*** addresses the role of physical activity for a healthy weight and offers strategies for being less sedentary

There are also three Apply variations you can mix-and-match with any of the Add variations to create a customized lesson of your choosing.

TEACHING MESSAGES

- | | |
|------------------------------------------------------------|-----------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Eat breakfast | <input checked="" type="checkbox"/> Drink water instead of sugary drinks |
| <input type="checkbox"/> Eat different kinds of fruits | <input checked="" type="checkbox"/> Eat foods from most MyPlate food groups |
| <input checked="" type="checkbox"/> Eat healthy snacks | <input checked="" type="checkbox"/> Do things to be physically active |
| <input type="checkbox"/> Eat different kinds of vegetables | |

LESSON MATERIALS

All Variations

- Access to equipment to show videos (computer, projector, etc.)
- WebMD fact sheet: *Portion Size Guide for Teens*

Apply, Variation A

- Portion Distortion cards, printed in color on card stock
- Fruit Pizza recipe cards

- Ingredients and equipment for Fruit Pizza recipe:
 - Cooking spray
 - Eggs (1 large)
 - Vegetable oil (1/4 cup)
 - Brown sugar (1/4 cup)
 - All-purpose flour (1/3 cup)
 - Ground cinnamon (1/4 tsp.)
 - Baking soda (1/4 tsp.)
 - Quick-cooking oats (1 cup)
 - Fat free cream cheese (1/4 cup)
 - Nonfat vanilla yogurt (1/2 cup)
 - Strawberries (1 cup)
 - Blueberries (1 cup)
 - Kiwi (2 medium)
 - Small mixing bowl
 - Medium mixing bowl
 - Measuring cups & spoons
 - Baking sheet
 - Aluminum foil
 - Plastic wrap
 - Paper towels
 - Cutting board
 - Knife
 - Whisk or fork
 - Mixing spoon
 - Napkins or paper towels
 - Sanitizing wipes

Apply, Variation B

- Food packages with brands and serving size information covered up:
 - Box of cereal (sugar-sweetened cereal with at least 10 g of sugar per serving)
 - Box of snack crackers (Triscuits or store brand woven crackers)
 - 64-ounce carton of 100% fruit juice (apple or orange juice)
- Serving dishes, two of each type:
 - Salad bowls
 - 7" plates
 - 12-ounce drinking glasses
- Set of dry and liquid measuring cups

Apply, Variation C

- Yogurt Fruit Pops recipe cards
- Ingredients and equipment for Yogurt Fruit Pops recipe:
 - 20-oz. can crushed pineapple
 - 16 oz. low fat yogurt
 - 12 oz. frozen orange juice concentrate
 - 3-oz. size paper cups
 - Popsicle sticks
 - Can opener
 - Mixing bowl and spoon
 - Napkins or paper towels
 - Sanitizing wipes

LESSON PREPARATION

Apply, Variation A

- Prior to the lesson:
 - Prepare the Fruit Pizza according to the recipe instructions. Cover the pizza with plastic wrap and store in the refrigerator.

- Day of the lesson:
 - Set out the Portion Distortion cards for the Apply activity.
 - Set out the supplies for the Fruit Pizza samples.

Apply, Variation B

- Prior to the lesson:
 - Cover the **brand name** and **serving size information** section of the Nutrition Facts label on the box of cereal, box of snack crackers, and carton of juice with electrical tape.
- Day of the lesson:
 - Set up a table with the food products, serving dishes, and measuring cups.

Apply, Variation C

- Prior to the lesson:
 - Make the fruit pops according to the recipe instructions. Store in the freezer until the day of your program.
 - Day of the lesson:
 - Transport the fruit pops in a cooler to keep frozen.
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TRANSITION

Last time we met, we talked about Who would like to share about...?

Today, we'll be talking about energy balance. Lots of things affect how much energy we need. For instance, whether you're male or female, short or tall, active or sedentary all play into how much energy you need on a daily basis. Your body needs a certain amount of energy just to function – this is called your Basal Metabolic Rate, or BMR. Your BMR accounts for things like breathing, digestion, cell repair, growth, and body maintenance. If you're active, your body needs additional energy to do things like learn, walk, or play sports. Energy balance occurs when you take in enough food to cover your body's functions and any additional activity you may do. We'll explore this idea of energy balance in more detail in this lesson.

ANCHOR

A lot of teens don't get as much movement as they need for optimal health. Our society today has made it easier and easier to be sedentary. Instead of doing our own grocery shopping, we can order our food online and have it delivered to us. Many of us choose to text our friends instead of walking or riding a bike to their house. When we cut out opportunities to be active, it can affect how many calories we need to eat. However, many of us don't adjust our calorie intake to compensate for reduced activity, which can put us out of energy balance.

Think of something you've seen in your environment that encourages sedentary behavior. Who wants to share their example? *[Discuss participants' responses as a group for a couple of minutes.]*

ADD

Variation A – Being in Balance

In order to function, our bodies need energy. Food and drink provide that energy, in the form of calories. A calorie, then, is simply a unit of energy. Calories are in practically everything we consume, with some foods providing few calories and other foods providing a hefty dose. Along with calories, food and drink provide other nutrients, like vitamins, minerals, and fiber. Thus, when thinking about your body's energy needs, it's important to consider not only the amount of calories, but also the other nutrients in the food.

Calories come from three main components of food: carbohydrates, protein, and fat. Carbohydrates and protein provide 4 calories in each gram. Fat has twice the amount of calories, providing 9 calories for each gram. That's why it's important to pay attention to how much fat you get in your diet. The calories in carbohydrates, protein, and fat are broken down during digestion into smaller components that the body then uses to make energy, repair cells, build muscle, and provide fuel for your brain and other organs.

How many calories do you need each day? *[Allow for a few responses.]* The answer is, it depends. For instance, your age, gender, height, weight, and physical activity all help determine your daily energy needs. Boys need more calories than girls, typically. Teens need more calories than children or older adults. Taller people need more calories than shorter people. If you're really active, your energy needs will be much greater than someone who is a couch potato. The Dietary Guidelines for Americans recommends 1,600-1,800 calories per day for girls age 11-14 years, and 1,800-2,200 calories per day for boys. Getting enough calories is important for normal growth and development, but getting too many can lead to weight gain. Thus, it is important to be in **energy balance**, which basically means that you're taking in the right amount of energy to meet all of your body's needs without going over.

Energy balance and weight maintenance has typically been thought of as a balance scale, with energy intake on one side and energy use on the other side. But this is too simplistic. Instead, think of energy balance as being dynamic, meaning that changing one part of the energy balance equation can affect many other factors that play into how your body uses energy.

Daily energy use is influenced by your **diet** in terms of what you eat, when you eat, and how much you eat. For instance, if you eat late at night, your body may store more of that energy as fat. The proportions of carbohydrate, fat, and protein in the food you eat affect how your body creates energy. The total amount of calories you eat determines whether or not your body will store energy for later use.

Physical activity also plays a part in your body's energy use, in many different ways:

- More intense activities use more energy than less intense activities for the same time period. For example, you'll burn more energy running for 30 minutes than walking for the same amount of time.
- Activities that increase muscle mass increase your body's *resting metabolic rate*, or the rate at which your body uses energy to do things like think, breathe, or produce new cells.
- Physical activity can alter your appetite and the hormones that regulate appetite. It helps you not to overeat.

What questions do you have about energy balance? *[Allow for a few questions and a small discussion if time permits.]*



[If time permits, show the following video clip to the participants. Ask them if they relate to the sentiments expressed in the video.]

Let's Go Learn Stuff: What are Calories? (2 minutes): <https://youtu.be/r5BxTG3YVe4>

Variation B – Portion Distortion

Portion sizes have gotten out of control. Everywhere you go, you encounter large portions: at the convenience store with “big gulp” drink cups, “big grab” snack bags, and “king size” candy bars; at fast food restaurants with “super-size” combo meals; and even at sit-down restaurants, where a typical meal can easily serve 3 people. Over the past few decades – longer than you've been alive – portion sizes have increased substantially. The average dinner plate is now about 11 inches in diameter – and in some restaurants, they can be as large as 13 inches. In comparison, 20 years ago, it used to be 7-9 inches. All that extra food is usually high in calories, fat, and sodium, enticing you to eat more. There is plenty of research that shows when people are offered more food, they eat more. This is known as the **portion size effect**. The more food you are presented with, the more you tend to eat – over 400 extra calories per day, in fact. And here's something to think about: when we eat a larger amount at one meal, we don't make up for it later by eating less at the next meal. The result is that we are way out of energy balance, taking in more energy than our body uses for metabolism, physical activity, and digestion.

Portion size effect is just one factor that influences how much we eat. But there are many other things that are at play, such as:

- **Value for the money.** Larger sizes tend to be proportionately less expensive. Have you ever ordered a small soda, only to have the cashier ask you if you want to upgrade to a larger size for only a few cents more? Sure, you're getting more soda for the money, but you're also getting a lot more sugar and calories. Stick with the smaller size – your waistline and pancreas will thank you.
- **Mindless eating.** How many of you have ever sat down to watch your favorite TV show or a movie with a bag of chips or box of cookies? *[Ask for a show of hands.]* By the time the show ended, how much had you eaten? *[Allow for a few responses.]* Often times, we

overeate in these situations because we are distracted by the show. A good solution is to pour out a small amount into an individual bowl before the show starts.

- **Estimation bias.** This is when we incorrectly guess how much a serving should be. Even though the Nutrition Facts label tells us how much a serving is, many of us don't pay any attention to it. Or, in some cases, the actual serving size is much less than what we think it would be, and thus we eat more. This is compounded with the "new norm" of portion sizes that we encounter all around us. Becoming familiar with standard portion sizes helps to reduce estimation bias.

But what, exactly, is a portion? And how is this different from a serving? Basically, a portion is the actual food that is put on your plate – whether you serve yourself or if it comes pre-served, as in a restaurant. A serving size, on the other hand, refers to the recommended amount of a food that should be eaten. These recommended amounts are defined by experts and are usually reflected on the Nutrition Facts label. Some examples are 1 slice of bread, 3 ounces of meat, a medium piece of fruit, a half-cup of vegetables, or 8 ounces of milk. Sometimes, the recommended serving size is vastly different than the amount you dish out. Think of ice cream: a serving of ice cream is a half cup, or 4 ounces. But we typically eat at least twice that amount – sometimes four times that amount. What are some other foods you can think of that you probably portion out much differently? *[Allow for a few responses.]*

So how can you reel in the amount of food you eat? There are many ways you can take control of your portions. First of all, **simply being aware of what a serving size is** will help you determine if the portion you are eating is too large. It may take some practice to learn what the recommended serving size of different foods is, but soon it will become second nature. Reading the Nutrition Facts label is a great place to start. You can always **downsize your order**. Go for the small combo meal or movie popcorn. Eat a fun-size piece of candy instead of an entire candy bar. Choose a 12-ounce soda instead of a 20-ounce cup. When you go to a restaurant, **split a meal** with a friend or box half of your meal to take home and eat later. What other strategies can you think of that could help you shrink your portions? *[Allow for a few responses.]*



[If time permits, show the following video clip to the participants. Ask them if they relate to the sentiments expressed in the video.]

What 100 Calories of Picnic Food Looks Like (1 minutes): <https://youtu.be/YwbKWInhVGI>

Variation C – Get a Move On!

How much physical activity is recommended for people your age? *[Ask for a few responses.]* Experts recommend 60 minutes – or more – of daily moderate or high-intensity physical activity for children and adolescents ages 6-17. Your natural pattern of movement has likely changed from when you were a younger child to now. Think of when you used to have recess in elementary school. You most likely did things like play tag, jump rope, or other activities that involved running, jumping, hopping, and skipping. What other things did you do as a kid? *[Allow for a few responses.]* Whatever type of activity you did, it was done in a fun, unstructured way, and probably involved a lot of starting and stopping. Now that you're older, you don't

have recess anymore. If you play sports, it's usually as part of an organized sports team. You're probably doing longer periods of sustained exercise – less starting and stopping – but you do still have some breaks. But without recess, and if you don't play on a sports team, you'll have to be more creative about finding ways to get your daily physical activity.

In addition to this intentional activity, building movement into everyday activities helps you be more active overall. You've probably heard the advice to take the stairs instead of the elevator, which is a good start. But have you thought about biking or walking to school if you could? What are some other ways you could get more movement throughout your day? *[Allow for a few responses.]* Society and technology aren't helping us get more active, either. Our televisions can be controlled by our voices. We can call to have someone deliver our food to us instead of going to pick it up, or even better, making the meal ourselves. We have vacuum cleaners that automatically clean our floors, and leaf blowers instead of rakes. While these technologies might be convenient, they're not doing much to help us with our health and they contribute to our increasingly sedentary lifestyles.

And let's talk for a moment about screens. Simply put, screens are everywhere. As many as 75% of teens age 12-17 have smart phones. And the latest statistics show that they're spending up to nine hours per day on screens, doing things like watching online videos, playing video games, using social media, and listening to music. Some of these activities – namely, listening to music – can be done in a way that promotes physical activity, such as listening to your favorite play list while going on a walk or dancing in your bedroom. But when it comes to the other screen time activities, these are usually done at the expense of movement.

Check out these other benefits associated with physical activity. When you are more active, you are less likely to gain weight over time. This is especially important as you enter adulthood. That seems like it may be a long way off, but remember, choices you make now, as a teen, will affect the health you have as an adult. Regular exercise can increase fitness levels and muscle mass, which helps your body run more efficiently. Being physically active helps build and maintain both muscle and bone mass. Weight-bearing physical activity strengthens muscles and helps form new bone. When muscles pull and push against bone, it makes the bones stronger. Weight-bearing exercise includes activities like running, walking, dancing, playing ball, or jumping. Lifting weights and other strength-training exercises also help build bone mass. Activities like biking and swimming, while great physical activities, do not help build bone mass, but if you like to bike or swim, it's a great opportunity to get much-needed movement.



[If time permits, show one of the following video clips to the participants. Ask them if they relate to the sentiments expressed in the video.]

3 Ways Your Phone Can Make You Move (1 ½ minutes):

<https://fit.webmd.com/teen/move/videos/video-phone-help-you-move>

What Do You Consider Fun Exercise (2 minutes): <https://fit.webmd.com/teen/move/videos/video-consider-fun-exercise>

APPLY

Variation A – Too Much “Energy In”?

Over the past 20 years, portion sizes of food have expanded quite a bit. Not surprisingly, Americans’ waistlines have also grown bigger. It’s hard to know what a “normal” portion should look like, especially when we’ve become accustomed to platter-sized dinner plates at sit-down restaurants or “big-gulp” soft drinks from the convenience store.

But just how much bigger are the foods we eat? And how many extra calories does this translate into? How does this affect energy balance?

Let’s compare some different foods that a lot of teens eat. We’ll look at what a typical size was 20 years ago, and what the size is for that same food today. *[Show the first portion distortion card.]* Twenty years ago, when you got popcorn at the movies, you got a 5-cup container, which had about 270 calories. Today’s popcorn is much larger. Who would like to guess how many cups is in a large movie theater popcorn? *[Allow for a few responses.]* The answer is 11 cups – more than double the amount from the past. All this extra food means extra calories. How many calories do you think are in the bigger size? *[Allow for a few responses.]* The large popcorn has 630 calories. *[Write this on the board.]* How many additional calories are in the larger popcorn? *[Allow for a few responses.]* That’s quite a bit more calories – almost a meal’s worth. Let’s look at another food.

[Repeat the above process with the remaining portion distortion cards, up to 8, depending on the amount of time you have available.]

You probably already knew that portions are large – but after this activity, are you surprised by how much larger they are and the amount of extra calories that come with these larger portions? How would you have to adjust your energy balance in order to accommodate the extra calories? How might this influence your food choices in the future? *[Allow for a brief discussion.]*

I have samples of a fruit pizza that you’re welcome to try. This fruit pizza has a whole-grain crust that’s made with oats. You can put whatever fruit you want on it – customize it however you’d like. It makes a great snack and helps you meet your daily goal of five servings of fruits and veggies.

Answer Key for Portion Distortion Cards

Popcorn: 630 calories, 11 cups

French Fries: 610 calories, 6.9 ounces

Cheeseburger: 590 calories

Pizza: 850 calories

Spaghetti & Meatballs: 1,025 calories, 2 cups

Muffin: 500 calories, 4 ounces

Soda: 240 calories, 20 ounces

Bagel: 350 calories, 6-inch diameter

Variation B – How do Your Portions Stack Up?

Balancing how much energy you take in, in the form of food and drinks, with the amount of energy your body uses, can sometimes be tricky. One thing that makes it hard to be in energy balance is the oversized portions all around us. We sometimes lose track of what a realistic portion should look like. Let's look at this in a demonstration.

The first food we'll demonstrate with is a box of sweetened cereal. I need a volunteer to come up and pour a bowl of cereal. Pour out how much you would serve yourself if you were eating breakfast at home. *[Have the volunteer pour out the cereal into one of the empty bowls. Thank the volunteer for his/her help and have them return to their seat.]*

Now I need another volunteer to come up and put some crackers on this plate. *[Have the volunteer measure out how much they would eat if they were serving themselves a snack. Thank the volunteer for his/her help and have them return to their seat.]*

For our last example, I need someone to pour some juice into this glass. Pour how much you'd drink if you were having the juice with dinner. *[Have the volunteer pour the juice into one of the empty drinking glasses. Thank the volunteer for his/her help and have them return to their seat.]*

Okay, now that we've served ourselves, let's see how our portions stack up against the recommended serving size on the Nutrition Facts labels for each of these foods. *[Ask for a volunteer to come up. Hand them the box of cereal.]* Pull back the tape from the Nutrition Facts label. Measure out what a serving of the cereal is using the measuring cups. Pour it into this bowl. Then, ask another volunteer to peel back the tape from the Nutrition Facts label. *[Have the volunteer return to their seat. Hold up the two bowls.]* What do you think? How do the two bowls of cereal compare to each other? Were we close or were we way off? *[Allow for a brief discussion.]*

Let's move on to the crackers. I need someone to help me count out the number of crackers the Nutrition Facts label says is a serving and place them onto this clean plate. *[Ask a volunteer to come up, remove the tape from the box of crackers, and count out a serving. Have the volunteer return to their seat when done.]* How did we do with the crackers? What do you think about the recommended serving size – is it realistic of what you actually eat?

Our last product was the fruit juice. I need a volunteer to come up and pour the recommended serving of juice into a liquid measuring cup and then pour that into this clean drinking glass. *[Recruit a volunteer to assist with this. Have them return to their seat when done.]* What do you think about how the actual serving looks like in this 12-ounce glass? How do you think the size of our containers influences what we serve ourselves? *[Allow for a brief discussion.]*

[Ask a new volunteer to peel back the tape and measure out a serving of the juice into a second drinking glass. Note the difference between the two. Comment about how "small" the amount of juice looks in a larger glass; discuss what implications the size of the food container has on how much we might serve ourselves.]

[Invite participants to sample some of the snack crackers from the Apply activity when you are done.]

Variation C – How Much Movement?

All the extra calories we're exposed to with gigantic portions can throw us out of energy balance – unless we step up our physical activity to use them. Seems easy, right? Maybe. Just how much extra physical activity is needed to use the additional energy? Many factors affect that – your age, height, weight, gender, and even the amount of lean body mass (muscle) you have. It also depends on what kind of activity you're doing and how long you do it. The average 13-year-old is about 5'1" and weighs 105 lbs., according to CDC growth charts. This may or may not describe you, but we'll use this average person to calculate how much physical activity is needed to use extra calories from big portions.

Lane

Lane goes out for lunch on Saturday and orders a quarter-pound combo meal from the local fast food restaurant, which includes:

- A quarter pound hamburger with cheese
- Medium French fries
- Medium soft drink

Lane should aim for 600 calories at lunch. How many calories do you estimate are in the medium-size combo meal Lane orders?

Answer: 1,090 calories

In order to account for the extra 490 calories from the meal, Lane decides to go on a walk. How long do you think Lane would have to walk to use those extra calories?

Answer: Lane would need to **walk 2 hours, at a very brisk pace.**

That's a lot of time! What if Lane decides to jog instead of walk – how long would that take to burn the extra calories?

Answer: Jogging would take **1 hour** to use the extra calories.

Would biking would burn more, less, or the same as walking?

Answer: Biking would take **1 hour, 15 minutes** to use the extra calories.

Is this realistic for someone to do? Why or why not?

Pat

After a long week at school, Pat goes out for ice cream with some friends. A “small” ice cream dessert with chocolate candy pieces is only 80 cents more than the “mini” size, but is double the size – more value for the money! Pat orders the “small” ice cream dessert.

How many calories do you think are in the small size dessert?

Answer: a small ice cream dessert with chocolate candy pieces has 630 calories.

A “mini” one, by comparison, has 370. Pat doesn’t want to pack on extra pounds. If Pat wanted to burn off the **extra 260 calories** from the bigger dessert by playing tennis, how long do you think Pat would have to play?

Answer: 33 minutes

What about if Pat wanted to swim laps at the neighborhood pool – how long would Pat have to swim?

Answer: 40 minutes

What advice would you give Pat about eating a snack that has as many calories as a meal?

One way to keep calories in check when eating indulgent foods is to swap out high-fat ones for lower-fat ones. I’ve made some frozen yogurt pops that have calcium, protein, and fruit. You can make these at home with 3-oz. paper cups and a straw that’s been cut in half. Each fruit pop has 270 calories and provides 70% of your daily calcium, 30% of your daily potassium, and a full day’s amount of Vitamin C. Plus, they’re cool and refreshing. *[Invite participants to sample the fruit pops.]*

AWAY

[Pass out a copy of the Portion Size Guide for Teens fact sheet to each student.]

This fact sheet was written specifically for people your age. It gives some of the tips for measuring portions that you’ll find helpful. There is also a quiz to see how well you can estimate portion sizes. Fill out the quiz and bring it back next time to see how you did.

NOTES

RESOURCES

Manore MM, Larson-Meyer DE, Lindsay AR, Hongu N, and Houtkooper L. (2017.) Dynamic energy balance: An integrated framework for discussing diet and physical activity in obesity prevention – is it more than eating less and exercising more? *Nutrients*, 9(905):1-14. Doi:10.3390/nu9080905.

Office of Disease Prevention and Health Promotion: Health.gov

US Dept. of Health and Human Services, National Heart, Lung, and Blood Institute:
<https://www.nhlbi.nih.gov/health/educational/wecan/eat-right/portion-distortion.htm>

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