



Lesson 5

Sustainability Dash



**SOUTH DAKOTA STATE
UNIVERSITY EXTENSION**



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Lesson 5: Sustainability Dash

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Core Curriculum Area: Dietary Quality, Food Resource Management, Food Security

Objectives

Teens taking this class will:

1. Discern between foods with higher and lower carbon footprints.
2. Make food choices that will better sustain the planet.
3. Demonstrate that plant-based foods, like fruits and veggies, are healthy and sustainable choices.

Behavioral Focus

This lesson prompts teens to:

1. Examine how their food choices can impact the planet.
2. Choose foods with a lower carbon footprint.
3. Choose more plant-based foods, like fruits and veggies.

Background

This is the longest background section you will read in any *Rev It Up!* lesson. Why? We have found that while most nutrition educators know a bit about the other lesson topics, this topic is new to many. We hope you will learn a lot by reading this section. Perhaps you will want to share some of what you have learned with other educators. You can also use some of this info with other groups you teach, like adults.

What is sustainability?

Sustainability is all about taking care of our planet's resources now so people can have them well into the future.¹ There is only so much land, water, and other resources for all the world's people to share. Yet, some of our actions have done more harm than good. This has led to drastic changes in recent times that will affect how much food we can grow and how many people we can feed.

How is our food supply at risk?

One of the biggest changes in recent times is how warm our planet has gotten. This is called **climate change** or **global warming**. Earth has gotten about 2 degrees (°F) warmer, on average, than it was in 1850 before

modern industry.² That may not seem like a lot. Still, it has caused severe weather changes. Some people think climate change is a hoax. It is not. Almost all scientists who study the climate agree that climate change is real.³

Climate change and its effects on the weather have already affected what we eat. Here are some ways climate change has changed our food and water supplies:

1. Hotter and drier weather has made wildfires more common in recent years.⁴ In the U.S., most of these fires have been in the West. California has had more fires than any other state.⁵ California grows most of the nation's food. It is the number 1 producer of our dairy foods, fruit, nuts, and vegetables.⁶ These wildfires have ruined hundreds of acres of crops and livestock each year.
2. The warming weather also increases the risk of droughts or dry periods.^{7,8} With less rain and less water in the soil, crops provide less food. California has had many droughts. These have reduced how much fruit, nuts, and veggies we have grown.⁹
3. Climate change can alter where crops can grow. Many crops rely on certain high or low temperatures to produce the best quality or most food. Warmer climates are moving the best-growing locations in the Northern Hemisphere northward. For some crops, like maple syrup, the best growing location is moving out of the U.S. and into Canada.¹⁰ This can affect how much these foods cost and put the people who were growing these foods out of business.
4. Climate change also impacts how much clean drinking water we have. Droughts can dry up rivers, lakes, and groundwater.¹¹ For the water that is left, the warmer weather causes microbes that can make us sick to grow in it.^{12,13} While water close to land dries up in the heat, ocean water evaporates, or rises into the sky when it warms. This leads to tropical storms like hurricanes happening more often.¹⁴ The heavy rain and flooding from these storms can lead to microbes and chemicals polluting drinking water.^{12,13} Melting ice at the North and South Poles makes sea levels rise, which can cause waterways to be flooded with salt water.¹³ These problems will cause us to need to pay more money for water treatment to make it safe to drink.¹³

What causes climate change?

Climate change happens when there are too many

greenhouse gases in the air. Some of these gases are carbon dioxide, methane, and nitrous oxide. These gases rise in the air and trap heat which causes warmer temperatures. During the past 50 years most of the extra greenhouse gases in our air have come from our use of coal, oil, and natural gas. These energy sources are called “fossil fuels” because they are the remains of plants and animals from millions of years ago, like fossils. Their remains are mostly made of carbon and oxygen. That is why when we use fossil fuels we say we have left our **carbon footprint** on the Earth (even though it is really in the sky).

We use fossil fuels to heat our homes and to fuel our cars. We also use them to run the machines that grow, process, and transport our food. In fact, the food industry emits about 1/4 of the world’s greenhouse gases each year!¹⁵ The more we rely on fossil fuels, the bigger our carbon footprint will be and the warmer Earth will become.

Do some foods cause bigger carbon footprints than others?

Yes. It takes much more energy to produce animal foods than it does to produce plant-based foods.¹⁶⁻¹⁹ Animal foods include meats, poultry, eggs, seafood, and dairy products. Plant-based foods include fruits, veggies, grains, nuts, seeds and legumes. Why? Animals need more water, food, and land to grow than crops do. So, when people want to buy and eat more animal foods, more greenhouse gases are put into our air. To make matters worse, some animals, like cows and sheep, produce a very potent greenhouse gas, methane, when they pass gas. This is why beef and lamb have the highest “carbon footprint” of all foods!²⁰

What can we do to help solve this problem?

Some nutritionists have called for people to eat **sustainable diets**.^{21,22} Sustainable diets are diets that are both healthy for people and good for the planet.²³ In 2021, Rutgers researchers reviewed the science to come up with 5 ways we can teach people about sustainable diets.²⁴ We can teach them to:

1. **Eat more plant foods.** This does not mean we must convince people to become vegetarian or vegan.^{25,26} We can do a lot to help the planet by simply eating more plant foods, including fruits, veggies, and plant proteins.²⁷ We can also choose to buy meat that has been grown using sustainable practices that lowers its carbon footprint.
2. **Waste less food.** About 40% of food grown in the U.S. ends up being thrown out instead of eaten!²⁸ This can happen at all levels of the food system. Yet, most food is wasted in people’s homes.²⁹ Many of

the things we teach, like meal planning and storing food the proper way, can help people limit their food waste.

3. **Eat less processed food.** In the U.S., about 60% of the calories we eat come from food that is very processed, like sodas, chips, candy, instant foods, and processed meats.³⁰ Not only are these foods not very healthy, they create more pollution than other foods.³¹ Scientists say that if we all continue to eat these foods at the rate we are now, the world’s food carbon footprint may rise another 80% by 2050.³²
4. **Eat local and in-season foods.** We often take it for granted that we can buy almost any food we want at any time of the year. The truth is many of the foods in our grocery stores are shipped by boat or plane from all around the world. This may increase these foods’ carbon footprints.³³ Buying local foods has other benefits too. We can support local growers, build stronger communities, and choose foods grown with less pollution and food waste.³⁴ We have ideas for connecting you and the teens you teach to local and in-season foods later in this section.
5. **Eat sustainable seafood.** Seafood, like fish and shellfish, tends to have a lower carbon footprint than other animal foods, like beef and cheese.³⁵ Seafood is also rich in key nutrients like selenium and omega-3 fats.³⁶ Yet, it is hard to know which seafood is sustainable and which is not. Wild caught seafood may be overfished, which means too many are taken out of the ocean.³⁷ It then becomes hard for these fish and shellfish to mate and keep their numbers up. Some seafood is now “farmed,” but sometimes the way they are farmed can pollute water and destroy the nearby nature.³⁸ It can be hard to figure out which seafood to choose. Many guides exist, like the Seafood Watch (seafoodwatch.org), to help make this choice easier.

Why should we teach teens about sustainable diets?

There are many reasons to teach teens about sustainable diets.

1. Climate change will be one of our greatest issues to face this century.¹⁵ Each of us should learn to reduce our carbon footprint, even via small changes, like the way we eat.
2. We already want teens to eat more fruits, veggies, and legumes. This is just one more reason they should!
3. Teens tend to eat a lot of meat and not much seafood or plant proteins. By learning about

sustainable diets, teens may decide to eat a healthier balance of foods in the Protein foods group.

4. They will be the next group of adults and will have to make their own food choices. By learning this info, they can eat healthier and save money while also saving the planet.
5. Teens are interested in social justice. They are more likely to change their behavior due to social issues than their health.³⁹ Perhaps someday, because of you and *Rev It Up!*, the teens you teach may join other activists their age, and demand that their leaders invest in a more sustainable future.⁴⁰

How do we teach teens about sustainable diets?

Sustainability Dash does not try to teach teens all of what you have read above. But they may like learning about this so much that you may want to share some of this info with them or their parents. *Sustainability Dash* focuses on 3 tips for making sustainable food choices:

1. Use the power of plants!
2. Eat in the here and now! (Eating foods that are locally grown and in season)
3. Skip the processed stuff!

They also learn a little about limiting food waste and using guides to choose sustainable seafood. By playing a game based around choosing foods at a supermarket, teens learn how to change their shopping habits to include more sustainable foods.

What types of local, in-season foods can I teach teens about?

Sometimes it can be hard to find local, in-season foods. Foods labelled as “local” at the supermarket or “big box” store might not actually be from your local area. Their sale does not do much to help local growers stay in business.⁴¹ There are other ways to engage in local food. You just may not know about them yet! Use this section as a guide to see what local food exists in your area and use it to add to *Sustainability Dash*.

A common place for local food is farmers’ markets and farm stands. These are places where farmers bring what they grow or make and sell them to shoppers. Many farmers’ markets are outdoors and are open from spring to fall. Others take place indoors and may run through the winter too. Many farmers’ markets accept SNAP benefits and special WIC vouchers known as the “Farmers’ Market Nutrition Program.” There are also programs that help people get more fresh fruits and veggies when they use SNAP, like Double Up Food Bucks. Sharing which farmers’ markets in your area have these programs with teens can convince them or their

families to try shopping at a farmers’ market. An Internet search, like **farmers’ markets near me**, is a great way to start learning about what is in your area.

Another way to find local, in-season food is via **Community Supported Agriculture (CSA)**. CSAs are like *Shark Tank*[®] for farmers. Farmers go to the public (people like us) to ask for the money they need to grow food for the growing season. People who invest in a “CSA share” end up getting a share of the food that farmer grows for the whole season. CSA shares may include fruit, veggies, eggs, meats, herbs, and even flowers, all of which are grown nearby. Sometimes, people receive veggies in their CSA share that they may have never heard of, like fiddlehead ferns or kohlrabi (cull-RAH-bee). Often, the farmer will provide recipes or tips to cook the less familiar foods in a CSA share.

CSA shares are usually purchased in winter or early spring. It can be pricey to pay for a full season upfront! Luckily, many CSAs now have options to help more people afford them, like:⁴²

- Accepting payment plans,
- Accepting work on the farm as payment,
- Accepting benefits like SNAP, and
- Using grants to cover some or all the cost for people who do not make much money.

Every CSA is a little different, so it's best to look up the CSA programs in your area before sharing with others. An Internet search like **CSA near me** is a great place to start!

Some people like to get very local with their food by growing some of their own food! Many veggies and herbs are easy to grow in a backyard garden. For people without much yard space, “container gardening” on patios, balconies, or windowsills can work ([here are some tips from Virginia Cooperative Extension](#)). There may also be community gardens in your area that allow people to grow their own food for free or for a small fee.

If you or the people you teach are not yet ready for farmers’ markets, CSAs, or growing food, you can always start with buying fruits and veggies in season. Seasonal fruits and veggies travel less to get to your plate. They are also often cheaper and tastier! Try running an Internet search for **seasonal produce in [your state’s name]** to find a list of what months each fruit and veggie are in season where you live. If your program provides recipes and/or samples to people, try to match up which recipes you use with what fruits and veggies are in season. It will help them save money, try tastier food, and do a little good for the planet!

What if I'm still unsure about teaching this lesson?

Climate change and sustainable diets may be a new topic for you. It may also be a sensitive topic, depending on who you work with. Some farmers rely on foods with high carbon footprints to make money. Some people fear that if we change the way we grow food to better help the planet, then farmers will lose money and will not be able to support themselves or their families. Our frank opinion is that everyone loses when we do not take care of our planet. By teaching more people about sustainable diets, we can start discussions between people who grow food and people who eat it. You can work with partners, like your area's Extension agents, to craft your message in a way that will be respectful to all. They can also add to the lesson and teach teens other ways they can support the planet. If you have teachers or staff who are unsure about this lesson, direct them to some of the articles in the Works Cited section on the next page. There is lots of science out there about the benefits of sustainable diets!

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Materials Needed

Activity 1: Sustainability Dash

- ☐ Computer, projector, and speakers (or) SMART Board®
- ☐ Sustainability Dash Presentation
- ☐ Grocery Cards, 1 set per team (See “Prepare to Teach”)
- ☐ Sustainability Dash Team Posters, 1 per team
- ☐ VELCRO® or a similar brand hook-and-loop fastener
- ☐ Tape or mounting putty
- ☐ Scrap paper and pens
- ☐ Stopwatch or cell phone for timer

Prepare to Teach

1. Download the Sustainability Dash Presentation on a flash drive.
2. On Slides 13 and 15 of the presentation, there are examples of fresh fruits and vegetables and the months they are in season in New Jersey/South Dakota. Your state or territory may have different growing seasons. Check to see what they are and change the slides if you need to.
3. To make the **Grocery Cards**, download the Sustainability Dash Grocery Cards Template.
 - Print 1 set of the cards for each team.
 - Cut along the cards' borders to separate them.
 - Glue each card to a 3-by-5-inch index card.
 - Laminate the cards for future use.
 - Organize each set of cards and keep them together with a rubber band or binder clip.

Use a different color index card for each team, to make the cards easier to sort.

4. Download and print the Sustainability Dash Team Posters.
 - These posters are 36 by 24 inches. You may need to print them at a print shop.
 - Laminate the posters for future use.
5. Use VELCRO® or a similar brand fastener and stick strips to the Grocery Cards and the Team Posters.
 - Stick the loop sides (fuzzy sides) on the back of the Grocery Cards.
 - Stick the hook sides (scratchy sides) in each of the 3-by-5 inch rectangles on the Team Posters.
 - This way, teens will be able to attach the Grocery Cards to the Team Posters during the game.

Lesson Plan

Set-up

1. Set up the computer and projector or SMART Board® and load the Sustainability Dash Presentation. Set it to Slide 1.
2. Hang up the Sustainability Dash Team Posters around the classroom using tape or mounting putty.
3. Put the Grocery Cards, scrap paper, and pens in a place where you can get to them quickly when you need to.

Introduction (2 minutes)

1. Greet the teens as they walk in.
2. Ask if anyone has changed what they ate from a c-store since the last time you taught. Take a few answers from the teens.

Activity 1: Sustainability Dash (30 minutes)

1. Tell the teens that you will be talking about healthy eating again today. But you will be switching gears a little and discussing how what they eat can affect the planet.
 - Say, “You may have heard of sustainability before in the news or on social media. But you may not know what it means!”
2. Move to Slide 2 and read the definition of sustainability for the teens.
 - Tell them that the choices they make today can affect people in the future – even their children and grandchildren!
 - Give the teens a few examples of sustainable practices, like taking shorter showers, or shutting lights off when they are not being used. Ask the teens if they can think of any other practices.
3. Move to Slide 3. Tell the teens that there are ways to eat sustainably too, and you will teach them 3 tips to do so.
4. Move to Slide 4. Tell the teens about **Tip #1: Use the power of plants!**
 - Mention that a “carbon footprint” is a fancy way to say how much something can harm the environment.
 - Mention that some animals, like cows, sheep, and goats, make methane gas when they eat food. This gas is very potent and too much of it can be bad for the environment.
5. Move to Slide 5 and read it to the teens. Stress that you do not have to stop eating meat to eat

sustainably. But making our plates more like MyPlate helps us eat healthier and can support the planet.

6. Move to Slide 6. Show the teens the examples of plant proteins on the slide. Ask the teens which of these plant proteins they like to eat. Take a few answers.
7. Move to Slide 7 and **Tip #2: Eat in the here and now!**
 - Tell the teens that many local and seasonal foods can be found at farmers' markets and farmstands.
 - If you have time, talk about some of the local and seasonal foods in your area (see "Background" section for more info).

"It's springtime in New Jersey ... a great time for fresh asparagus!"

8. Move to Slide 8 and **Tip #3: Skip the processed stuff!**
 - Mention to the teens that a lot of processed foods, like the ones in the picture, are not very healthy. So they are not good for them nor are they good for the planet.
9. Move to Slide 9. Tell them that there is no "one way" to eat sustainably. Lots of little choices can add up!
10. Ask the teens if they are ready to play Sustainability Dash with you. Split the teens into teams and assign each team to one of the posters. Give each team a set of Grocery Cards, a piece of scrap paper, and a pen.
11. Move to Slide 10 and review the game's rules.
 - They have 5 minutes to choose 14 items from their set of Grocery Cards to hang up on their Team Poster.
 - There are certain numbers of foods from each MyPlate food group that must go on the poster. Let the teens know that in the yellow "Oils" section, they need to put 1 fat or oil used for cooking. In the pink "Limit" section, they need to choose 1 dessert.
 - They must choose foods they think would be the most sustainable.
 - Tell them that after the time is up, you will reveal how many "carbon footprints" each food has. The team with the fewest footprints wins!
12. Set a timer and say, "On your marks, get set, GO!"
 - Move to Slide 11 so the teens can be reminded of the 3 tips.
 - You and the teacher may want to walk around the classroom and help some of the teams if

they are stuck.

- Tell the teens when they have 1 minute left and count down the last few seconds.
13. When time is up, move to Slide 12. Tell them it's time to count their footprints. Say that as you go over each slide, 1 person from each team needs to tally the number of footprints that each food they chose has on the scrap paper.
 14. Go through Slides 13 to 22 to show the number of carbon footprints assigned to each item.
 - For the fresh fruits and veggies on Slides 13 and 15, the teens get 1 footprint if the food is in season and 2 footprints if the food is not. Remember: fewer footprints are better! So, if you are playing this game in September in South Dakota, a team would get 1 footprint for choosing plums and 2 footprints for choosing strawberries.
 - On Slide 20, there are 3 seafood options. All are great sources of Omega-3s. Omega-3s are important fatty acids that are good for brain health. Choosing sustainable seafood depends on many things like which country it is from and whether it is wild or farmed. Tell the teens that they can find out more at seafoodwatch.org.
 15. Move to Slide 23. Have the teens add up their footprints and tell how many they have to the class. Declare the team with the lowest number of footprints the winners!
 16. Move to Slide 24. Mention how one other way to eat more sustainably is to reduce food waste.
 - If you have time, ask the teens how they think people could reduce food waste. Take a few answers.

Some ways to reduce food waste include buying only what you need, using leftovers, and storing foods in the right place.

17. Move to Slide 25. Let them know that teens all around the world have been fighting for a more sustainable future. Tell the teens they could get involved too. They could write letters to their elected officials about protecting the planet or teach other people in their community about sustainability.
18. End by going to Slide 26. Tell them that there's only one Planet Earth. It's **Your Planet, Your Food, Your Choice!**

Wrap up (3 minutes)

1. Ask the teens what they learned and what they may try to do this week to eat better for the planet.
2. Let them know that for next time, you will be talking about snacks, and how to make healthy, planet-friendly swaps!

After the lesson is over, remind the site teacher what her/his role will be for the next lesson. You may want to send an email like this:

I'm so glad I was able to talk about sustainable diets in the last lesson. I hope that the teens feel inspired to make some planet-friendly choices! The next time I come, I will need your help running the slides. I have attached them to this email in case you want to look over them ahead of time. Also, we will be walking indoors and be passing out some food samples! (Remember to attach the Lesson 6 slides!)



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