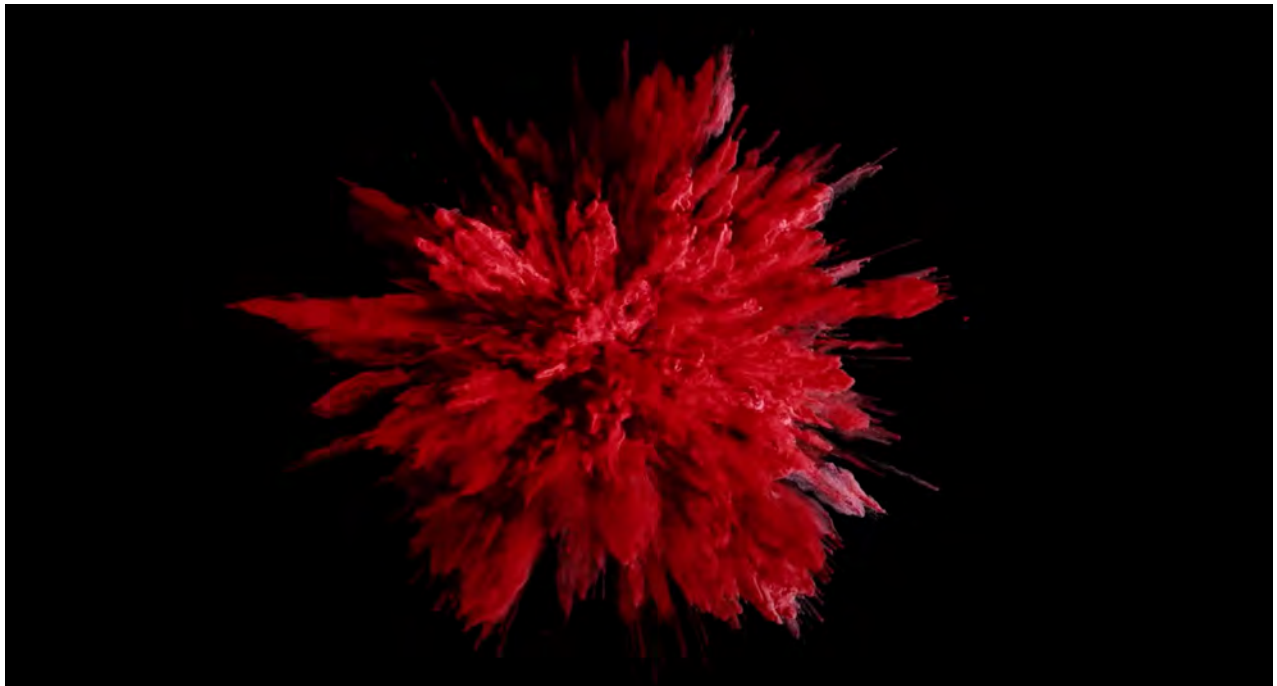


FOOD AND THE BODY: **DIET-RELATED ILLNESSES**



SUMMARY

This lesson shows students how their diet affects their physical health in the short and long run. It teaches the importance of eating a balanced diet and draws a link between a poor diet and diet-related illnesses. Through this lesson, we introduce students to the major categories of diet-related illnesses.

Duration: 90 mins, 2 Sessions | Grade Level: 4th-7th

Module 2: Food and the Body

Diet-Related Illnesses

LESSON CONTENTS

• At A Glance	2
• Lesson Breakdown	3
• Prior Knowledge & Misconceptions	4
• Detailed Lesson Script	
• PART I	5
• PART II	9

LESSON RESOURCES

greenbeetz.org

our website hosts lesson slides, google forms, lesson videos, and teacher training videos, glossary, standards alignment and more

Worksheets

- Disease Fighting Foods Bingo Cards
- Video Worksheet
- Exit Cards

DIET-RELATED ILLNESSES: AT A GLANCE



ESSENTIAL QUESTION

What are the most common diet-related illnesses and what do healthy blood vessels vs. unhealthy ones look like?



STUDENT LEARNING GOALS AND OBJECTIVES

After this lesson students will be able to:

- Explain what is a balanced diet and showcase skills in creating balanced meals
- Name the 4 main diet-related illnesses we see in modern day: obesity, heart disease, high blood pressure, type 2 diabetes.



VOCABULARY

- **Arteries** - blood vessels that carry oxygenated blood from the heart to the rest of the body.
- **Plaque** - build-up of cholesterol, fats, and calcium inside the walls of the arteries and can restrict and even block blood flow through the arteries.
- **Type II Diabetes** - an impairment in the way the body regulates and uses sugar (glucose) as a fuel.
- **High Blood Pressure (Hypertension)** - the force of blood pushing against artery walls is too high, beyond healthy levels.
- **Obesity** - an excessive amount of weight
- **Heart Disease** - when plaques block blood vessels that normally deliver oxygen to the heart, the reduced blood flow can cause heart pain and may even lead to a heart attack.



KEY POINTS

- Food doesn't just help make up different components of our bodies; it affects how we feel too! A balanced diet is the key to feeling great and performing your best in everything you do.
- The way we eat affects our bodies now and in the future. An unbalanced diet over a long time can lead to diet-related illnesses.
- Some of the most common diseases today are diet-related including: obesity, heart disease, high blood pressure, and type 2 diabetes.
- Diet-related illnesses are increasingly more common in recent years, largely because unhealthy processed foods are so easily available, and people are consuming them in increasing quantities.

LESSON BREAKDOWN

TIME	ACTIVITY	MATERIALS/RESOURCES
PART 1		
5 min	Introduction	Lesson Slides
5-10 min	Lesson Video: Diet-Related Illnesses	Vimeo or YouTube • Video Worksheets (<i>optional</i>)
12-15 min	Class Discussion & Vocab Review	Lesson Slides
10 min	Activity: Disease Fighting Foods Bingo	Bingo Sheet and Markers for Bingo
5-8 min	Food Detective Assessment	Exit Card
PART 2		
5 min	Review	--
20 min	Clogging the Blood Vessels	Blood Vessel Diagram • Tubes (ideally rubber or an old hose, but otherwise a paper towel roll can work) • Playdough • Cotton balls • Sandpaper
10 min	Snackz & Factz	Snack: Air-popped popcorn
5 min	Test Your Noodle	
5 min	Food Detective Assessment	Exit Card

PRIOR KNOWLEDGE AND MISCONCEPTIONS

PRIOR KNOWLEDGE

Students may have personal experiences or familiarity with the name of some of the diet-related illnesses that will be discussed today but they may not have a full or accurate understanding of how diet is related. It is important to discuss the effects of diet on how we feel and our moods, rather than only focusing on illnesses.

COMMON MISCONCEPTIONS

Students may draw (or already believe) in a simple causal relationship between diet and illnesses (“eating too much fat makes you fat” or “having too much sugar causes diabetes”).

POSSIBLE RESPONSE

Take the time to explain that our bodies are not simple and there are complex and not always understood relationships between our habits (what you eat, how much or little you exercise) and genetics (that which you have no real control over).

New information is constantly being learned on these connections. Reinforce that we are looking to create healthy habits and be more thoughtful about our choices and possible consequences on how we feel. Students should not walk away from these lessons scared or critical of anyone who has a diet-related illness.

DETAILED LESSON SCRIPT: PART I

Introduction

5 minutes

Use these questions to get students thinking about today's key points. Allow students to share if they know anybody with diet-related illnesses and their experience. Be mindful that some of your students may have them themselves and/or be sensitive if a relative does.

LESSON SLIDES



Introduction Questions:

- *What is a diet-related illness?*
- *What might happen if you ate fast food every day for a whole year?*

Lesson Video: Diet-Related Illnesses

5-10 minutes

To help students understand and retain information, you can have them use the video worksheet so they can take notes. If you don't want to use the worksheet, ask them to pay attention to the key words while watching.



DIFFERENTIATION

You should decide which structure will help your students access the information:

- Preview the worksheet as a class
- Have students watch the video and ask questions
- Watch the video more than once, pausing at key moments, etc.
- Or, you can allow their responses to be more open-ended and ask: What surprised you? What was most interesting? What was most important? Why?

Diet-Related Illnesses: Part 1 - Video Worksheet

Answers

1. What is a balanced diet?	Consuming the right amount of nutrients, minerals, water, and vitamins.
2. Why do we need a balanced diet?	A balanced diet helps us feel good, fuels us to perform in every action of our day (running, thinking, writing, etc) and decreases our chances of diet-related illnesses.
3. What are the short-term affects of a poor diet?	Heartburn, stomach ache, diarrhea, constipation, fatigue, bad mood, bad skin, trouble concentrating.
4. What do we call excessive weight gain?	Obesity.
5. What organs can be affected if someone has Type II diabetes?	Eyes, pancreas, kidney.
6. Why is high blood pressure dangerous?	It can cause the heart to have to pump harder and the vessels can burst/cause a stroke.
7. What can happen if blood vessels are clogged with fat (cholesterol)?	You can have a stroke or heart attack.

Class Discussion & Vocab Review

12–15 minutes

Lead a discussion after the video. Display or share the definitions of diet-related illnesses and refer to the Key Points as you ask students the following questions:

- *What is a balanced diet?*
- *What effect can a poor diet have on you in the short term?*
- *What effect can a poor diet have on you in the long term?*
- *What surprised or concerned you about the video?*
- *Are you confused about anything or have any specific questions?*

KEY POINTS



A Balanced Diet

A **balanced diet** leads to optimum physical health and feeling great. All the things your body does every day are fueled by what you eat—running, breathing, growing, thinking, pumping blood, etc.

A **balanced diet** contains the right amounts of different kinds of foods so that once these foods are digested, your body receives the right amount of carbohydrates, proteins, fats, vitamins, minerals, salt, and water that it needs for regular body processes.

Short-term vs. Long-term

If you do not consume a balanced diet, your body and mind suffer now and in the future. In the **short-term**, your diet might affect how you feel, look, or perform in sports and school. In the **long-term**, poor diet can lead to serious illnesses that can be life threatening.

Short-Term Effects

Things you might notice in the **short-term** from a bad diet include heartburn, stomachaches, diarrhea, constipation, fatigue, and a bad mood. After just a few days, a poor diet can lead to acne, trouble concentrating, and a weakened immune system.

Long-Term Effects

In the **long-term**, a poor diet can lead to many diet-related illnesses including obesity, diabetes, heart disease, high blood pressure, and even cancer.

Societal Trend of Diet-Related Illness

Diet-related illnesses are increasingly more common in recent years, largely because unhealthy processed foods are so easily available, and people are consuming them in larger quantities.

Class Discussion & Vocab Review (CONTINUED)

VOCABULARY



Obesity

Obesity is a being severely overweight for your body; obesity makes developing diabetes, high blood pressure, and heart disease more likely. Decreasing your consumption of high calorie foods and beverages can help maintain a healthy weight.

Diabetes

An impairment in the way the body regulates and uses sugar (glucose) as a fuel which untreated can result in high levels of sugar in the bloodstream which can damage nerves, blood vessels, and other organs such as kidneys and the pancreas. Complications of diabetes can include blindness, severe infections, tingling in the feet, increased thirst and hunger and increases your risk of heart disease.

High Blood Pressure (Hypertension)

You have high blood pressure when the force of blood pushing against your artery walls is too strong, beyond healthy levels. This increased blood force can lead to damaged and weakened blood vessels (arteries) which can be very dangerous to your health. Being overweight/obese and consuming high levels of salt/sodium, and inactivity can lead to high blood pressure also known as hypertension.

Heart Disease

Often correlated to years of consuming a poor diet, little bits of cholesterol, fats, and calcium can start to build up inside of blood vessel walls. These build-ups are called plaques. Your heart needs a lot of oxygen to properly function and when plaques block blood vessels that normally deliver oxygen to the heart, the reduced blood flow can cause chest pain, shortness of breath, abnormal heart beats, water retention (swelling) in the extremities and could lead to a heart attack.



Activity: Disease Fighting Food Bingo

10 minutes

Let's play Bingo to identify some great disease fighting whole foods. We encourage you to play multiple rounds and if you have time to come back to this again for part 2.

Bingo Prompts

Diet-Related Illnesses – Disease Fighting Food Bingo Prompts

- A dark colored berry that is full of antioxidants and helps control our blood sugar level (**Blueberries**)
- An orange root vegetable that supports eye health and boosts the immune system (**Carrots**)
- A starchy vegetable that you often have mashed or baked, and is full of vitamins, minerals, and fiber that help our immune system (**Potatoes**)
- A yummy nut spread that is high in healthy fats and fiber that helps protect us from heart disease and diabetes (**Peanut Butter**)
- A vertebrate that lives in waters and is high in essential fatty acids, omega 3's that helps with brain health and supports our immune system (**Fish**)
- A small white grain that provides us with a good source of energy and contains essential nutrients that helps us fight diseases (**White rice**)
- A yellow fruit that grows in bunches on trees, it's high in fiber, antioxidants, vitamins, and minerals, that help support heart health and the immune system (**Bananas**)



Food Detective Assessment

5-8 minutes

Have students answer the following on an Exit Card:

- *How does our diet (the food we eat) affect us? Consider the short and long-term effects on our mood and body.*

DETAILED LESSON SCRIPT: PART II

Review

5 minutes

Begin this session with a review question to recall the previous session:

Name some diet-related illnesses and what effect they can have on the body.

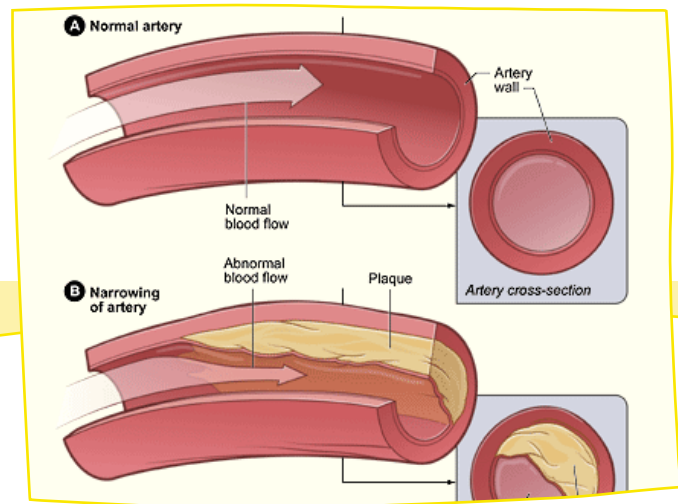


Activity: Clogging Blood Vessels

20 minutes

Project the Blood Vessel Image and begin this activity by considering the following:

1. What are the differences between the two blood vessels (normal vs. narrowing artery)?
2. What effect on the body might each vessel have?



MATERIALS

A tube: represents a healthy artery

Playdough: represents a plaques made up of bad cholesterol, calcium, and white blood cells

Cotton balls: represents blood clot

Sandpaper: represent the damage of consuming large amounts of sugar, trans-fats, & other toxins overtime

SET-UP FOR TEACHERS

Each student group/pair should receive: a tube, a cotton ball, a strip of sandpaper, and a bit of playdough

1ST: CREATE 3 KINDS OF BLOOD VESSELS

Have groups create and label different arteries by adding different amounts of playdough to their tubes

Healthy Artery

Scant amount of playdough added to tube: Nutrients can flow freely through the bloodstream to different internal organs

Sick/Partially Clogged Artery

Lots of playdough clogging the tube: Heart has to pump harder leading to high blood pressure, heart disease, diabetes

Blocked Artery

Tube fully blocked with playdough: Leads to stroke and heart disease



Activity: Clogging Blood Vessels (CONTINUED)

2ND: WHAT HAPPENS WITH A BLOOD CLOT?

The plaque buildup in blood vessels can rupture, or break apart, leading to blood clots. What happens when they try to pass a blood clot (cotton ball) through their partially blocked artery?

3RD: EXPLORE THE EFFECTS OF SUGAR, TRANS FATS, AND TOX-INS...

Now introduce the sandpaper, explaining that it represents the damage of consuming large amounts of sugar, trans-fats, & other toxins overtime. Give students a chance to predict its effects, and then test it out.

Questions to Consider while creating the Blood Vessels:

- Do you think the playdough will stick better to the smooth walls of the healthy blood vessel or better to the blood vessel when it is rough like the sandpaper?
- What might be the dangers of even small blood clots in someone with a clogged artery?
- What would happen if a blood clot occurred in a blood vessel that brought oxygen and nutrients to the heart? What if it led to the brain?
- Can you explain why doctors might prescribe blood thinning medications for patients?

Snackz & Factz

10 minutes

Popcorn can be prepared in the classroom with a hotplate, popper, microwave, or purchased pre-popped. Make sure not to serve pre-buttered or salted popcorn.



DO

Have students taste and/or prepare air popped popcorn

Present/Display the “Facts” about today’s Snack to the class as they are tasting

MATERIALS

- Air popped popcorn

FACTZ

Air-popped popcorn is a whole grain, so it is full of fiber. That’s great news for your arteries!

The healthiest way to prepare popcorn is air-popping without adding oil. You can even do this in a plain paper lunch sack rolled tight to seal it shut and heat it in a microwave.

Adding butter or salt can make popcorn a less healthy option. Try a dash of onion powder or garlic powder for a flavor kick.

Watch out for the movie theater popcorn though! A small order can have between 20 and 30 grams of saturated fat. That is BEFORE they add the buttery topping!

Test Your Noodle

5 minutes | (Optional: students complete this online)

1. List at least two activities that are fueled by the food you eat.
(everything, answers will vary)
2. Name two short-term health effects of an unbalanced diet
(acne, fatigue, difficulty concentrating, bad mood, heartburn, diarrhea, constipation, stomach upset)
3. Name three long-term illnesses related to poor diet.
(obesity, high blood pressure, heart disease, type 2 diabetes, cancer)
4. Name one poor diet choice and how it contributes to a diet-related disease.
(answers may vary)
4. Name one diet choice that can lead to better health.
(answers may vary)

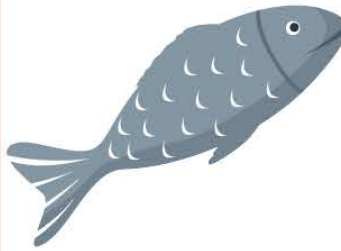
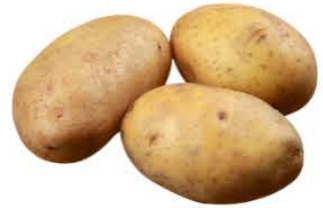
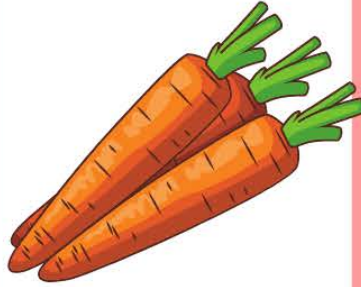
Food Detective Assessment

5 minutes

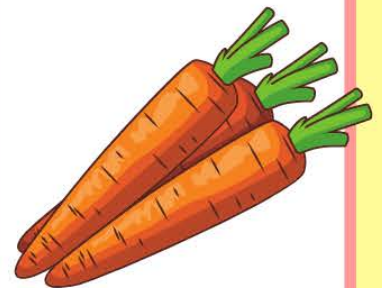
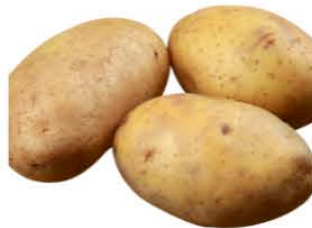
Have students answer the following on an Exit Card :

- *What is the best way to avoid diet-related illnesses? Explain.*

FOOD BINGO



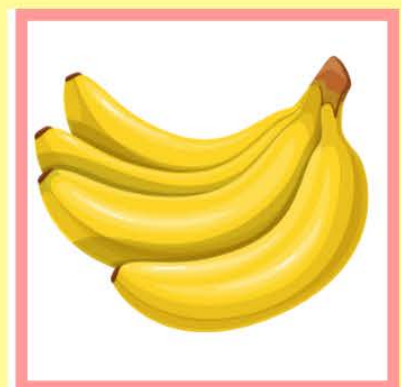
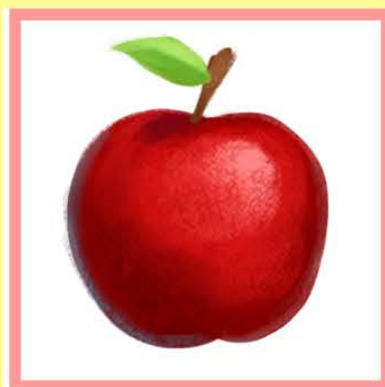
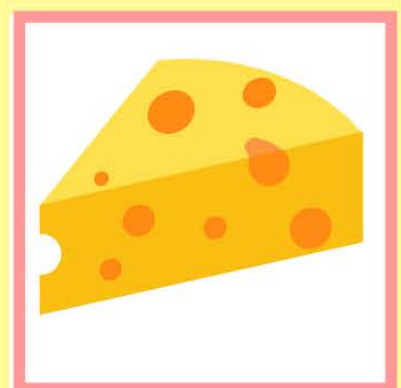
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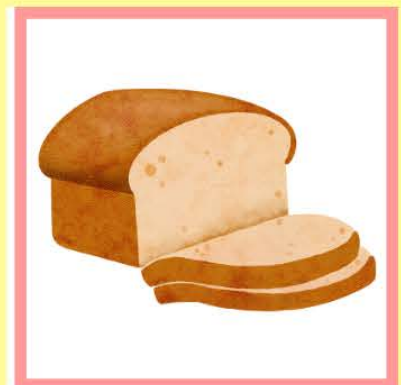
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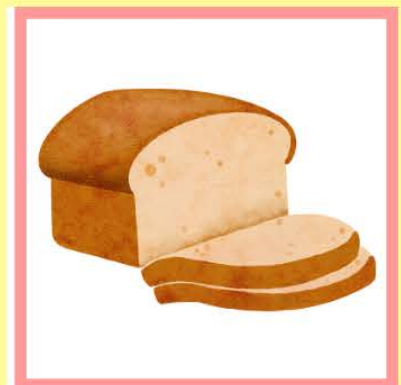
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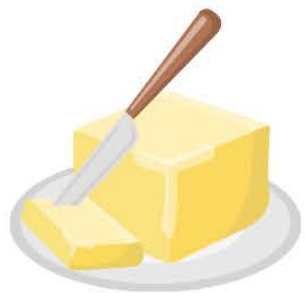
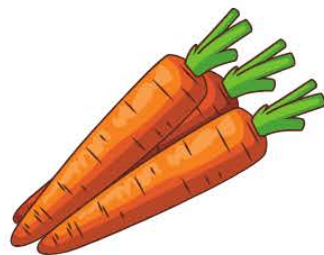
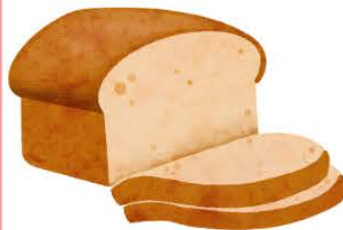
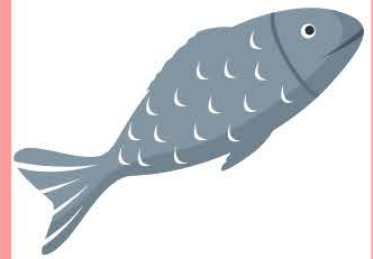
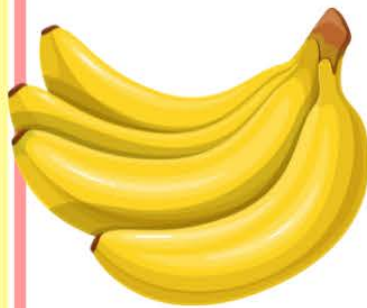
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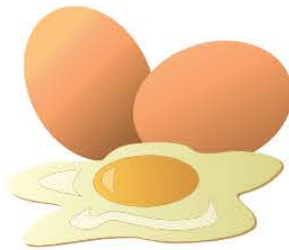
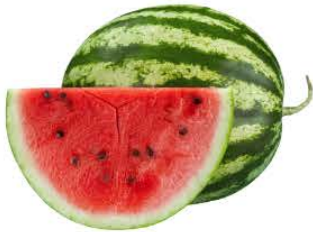
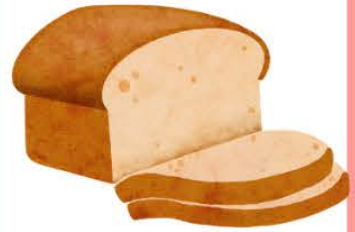
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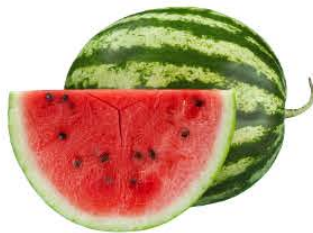
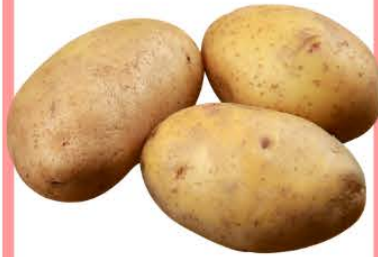
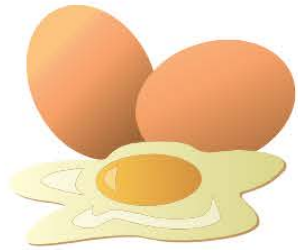
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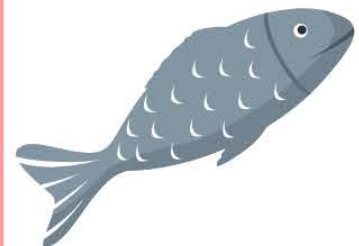
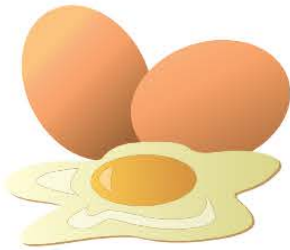
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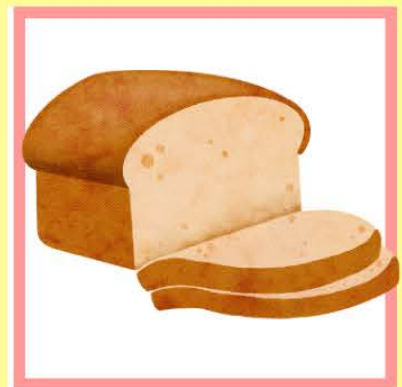
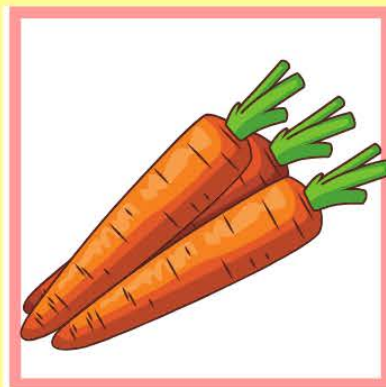
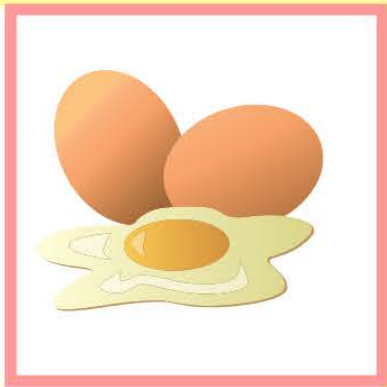
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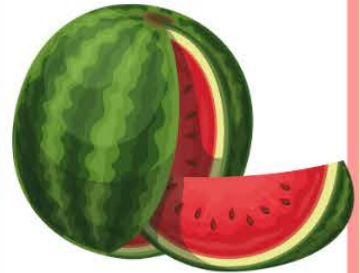
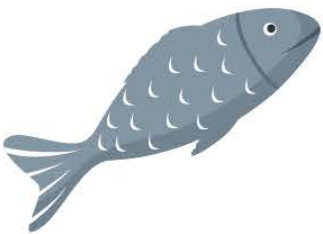
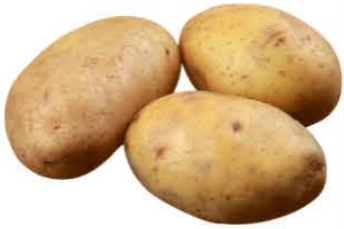
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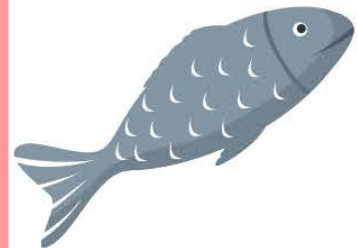
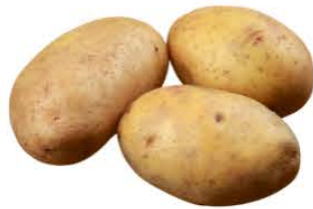
FOOD BINGO



FOOD BINGO



FOOD BINGO



Diet-Related Illnesses — Disease Fighting Food Bingo Prompts

- A dark colored berry that is full of antioxidants and helps control our blood sugar level (**Blueberries**)
- An orange root vegetable that supports eye health and boosts the immune system (**Carrots**)
- A starchy vegetable that you often have mashed or baked, and is full of vitamins, minerals, and fiber that help our immune system (**Potatoes**)
- A yummy nut spread that is high in healthy fats and fiber that helps protect us from heart disease and diabetes (**Peanut Butter**)
- A vertebrate that lives in waters and is high in essential fatty acids, omega 3's that helps with brain health and supports our immune system (**Fish**)
- A small white grain that provides us with a good source of energy and contains essential nutrients that helps us fight diseases (**White rice**)
- A yellow fruit that grows in bunches on trees, it's high in fiber, antioxidants, vitamins, and minerals, that help support heart health and the immune system (**Bananas**)
- A green powerhouse vegetable that looks like a tree, it's rich antioxidant and helps boost our immunity (**Broccoli**)
- A fermented dairy product that is probiotic, which helps keep our gut healthy (**Yogurt**)
- A green power house vegetable that you can find in your favorite salads. This vegetable is a rich antioxidant with important vitamins and minerals that helps keep your immune system strong (**Leafy greens**)
- A carbohydrate you use for wraps or burritos that provides a great energy source (**Tortillas**)
- A red berry that is a rich antioxidant that is high in fiber, vitamins, and minerals that help protect our immune system (**Strawberries**)
- A dairy fat used on your favorite breakfast foods like bread or pancakes, it's high in fat soluble vitamins which are important for bone health and immune function (**Butter**)
- A legume that is rich in protein and fiber, and is a great plant-based food that is good for heart health (**Beans**)
- A citrus fruit that is high in vitamin C and is great for our immune system (**Orange**)
- A whole grain starch that is typically eaten for breakfast and is high in fiber and nutrients that helps control blood sugar levels and heart health (**Oatmeal**)
- A whole grain starch often used for sandwiches that has more fiber, vitamins, and minerals than refined grain products. High fiber foods help with heart health and blood sugar control (**Whole Wheat Bread**)
- A dairy product that is a great source of protein and calcium, comes in hard, soft and spreadable forms (**Cheese**)
- A tree fruit that is an antioxidant high in fiber, vitamins, and minerals that can help support brain and heart health (**Apple**) or “one a day keeps the doctor away”
- A white bird meat that has a good source of lean protein and is low in saturated fat, which helps protect against heart disease (**Chicken**)

Diet-Related Illnesses — Disease Fighting Food Bingo Prompts

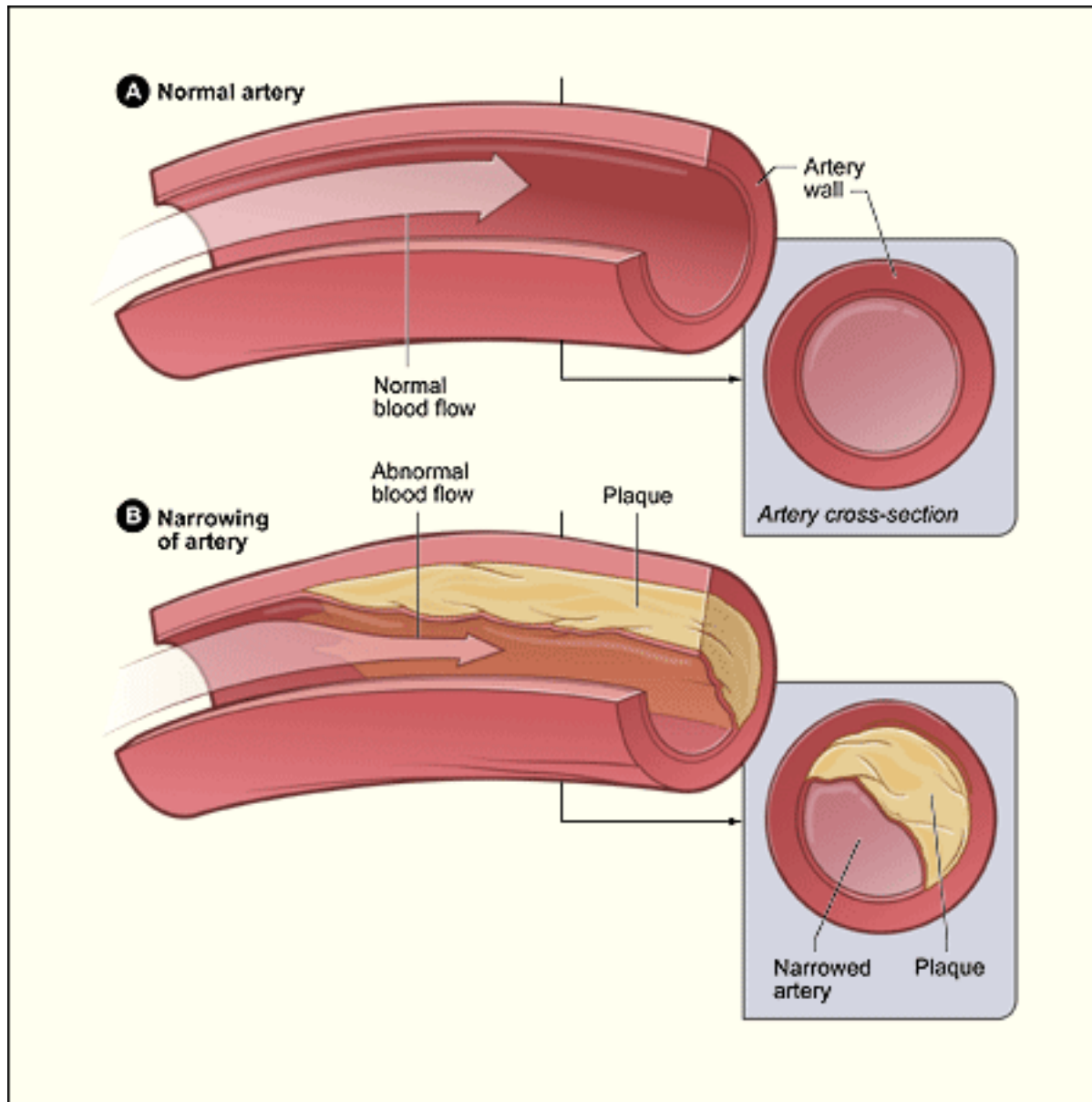
- A superpower green tree fruit with one big pit in the middle - is high in healthy fats and fiber that helps with heart health (**Avocado**)
- A starch seen in many Italian dishes that provides us with a great energy source and essential nutrients that helps our immune system (**Pasta**)
- A plant-based protein made of soy that is high in protein and other vitamins and minerals that can help with heart health (**Tofu**)
- A high water content fruit that has a hard rind. It contains a lot of the antioxidant lycopene; which gives the fruit it's inner red color and has essential vitamins and minerals that help with heart health and immune function (**Watermelon**)
- A dairy beverage high in vitamin D and calcium, which is great for our bone health (**Milk**)
- A breakfast item that comes from a bird and is a good source of protein and cholesterol as well as healthy fats that help with heart and brain health (**Eggs**)
- A fruit or vegetable that grows in a vine, often red but also comes in other colors and many different sizes, even cherry sized! It belongs to the nightshade family that is rich in antioxidants and nutrients that helps with cardiovascular health and reduces certain cancers (**Tomatoes**)
- A nutritious oil that is high in essential fatty acids that reduces inflammation and can help with cardiovascular and metabolic health (**Olive oil**)
- A starch used for sandwiches that provides an excellent source of energy and contains vital nutrients that helps fight diseases (**White bread**)

NAME

DATE

BLOOD VESSELS DIAGRAM

Normal artery compared to an artery with plaque



Diet-Related Illnesses: Part 1 - Video Worksheet

Name: _____

Date: _____

Read the questions before you watch the video. You can jot down your ideas as you watch or wait until the end.

1. What is a balanced diet?	
2. Why do we need a balanced diet?	
3. What are the short-term affects of a poor diet?	
4. What do we call excessive weight gain?	
5. What organs can be affected if someone has Type II diabetes?	
6. Why is high blood pressure dangerous?	
7. What can happen if blood vessels are clogged with fat (cholesterol)?	

Diet-Related Illnesses: Part 1 - Video Worksheet

Answers

1. What is a balanced diet?	Consuming the right amount of nutrients, minerals, water, and vitamins.
2. Why do we need a balanced diet?	A balanced diet helps us feel good, fuels us to perform in every action of our day (running, thinking, writing, etc) and decreases our chances of diet-related illnesses.
3. What are the short-term affects of a poor diet?	Heartburn, stomach ache, diarrhea, constipation, fatigue, bad mood, bad skin, trouble concentrating.
4. What do we call excessive weight gain?	Obesity.
5. What organs can be affected if someone has Type II diabetes?	Eyes, pancreas, kidney.
6. Why is high blood pressure dangerous?	It can cause the heart to have to pump harder and the vessels can burst/cause a stroke.
7. What can happen if blood vessels are clogged with fat (chlolesterol)?	You can have a stroke or heart attack.

Name: _____

Date: _____

Diet-Related Illnesses: Part 1 - Exit Card

How does our diet (the food we eat) affect us? Consider the short and long-term affects on our mood and body.

Name: _____

Date: _____

Diet-Related Illnesses: Part 1 - Exit Card

How does our diet (the food we eat) affect us? Consider the short and long term effects on our mood and body.

Name: _____

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Diet-Related Illnesses: Part 2 - Exit Card

What is the best way to avoid diet-related illnesses? Explain.

Name: _____

Date: _____

Diet-Related Illnesses: Part 2 - Exit Card

What is the best way to avoid diet-related illnesses? Explain.
