



STAGE 2

FOOD AND OUR BODY

Students will learn how grains support a healthy diet and help keep the circulatory and digestive systems healthy.

Lesson 3 • Heart Health

Overview

In this lesson, students will explore the circulatory system, the role of dietary fibre in supporting digestive and circulatory health, and participate in an active game/body break to reinforce their learning. Optional coding and career connection extensions are also included.

Learning Goals

Students will:

- Identify and name the main parts of the human circulatory system
- Describe the functions of the heart, blood vessels, and blood
- Describe the relationship between the circulatory and digestive systems.

Materials Needed

- [Stage 2 Lesson 3 Teaching Slides](#)
 - [Student Resource Packet](#) (all lessons, printable)
 - [STEMterprise Deliverables Tracker](#)
 - [Fibre and whole grains article from the Heart and Stroke Foundation](#) (online)
 - [Fibre and whole grains article from the Heart and Stroke Foundation](#) (pdf)
 - [Fibre and whole grains response](#) (printable)
 - Videos
 - [Circulatory System for Kids](#)
 - [How does the Heart and Circulatory System Work?](#)
 - [Understanding Fibre](#)
 - [Clogged artery game](#) (optional)
 - 5 pinnies
 - 2-3 hula hoops
 - Timer
 - Ozobots (optional)
 - Ozobot(s)
 - Markers (black, green, red, and blue)
 - White paper (or GOOS paper)
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Teachers' Notes

The active game/body break may be used during the lesson to help break up the content or later during physical education. Optional coding and career connection extensions are included at the end of the slides for teachers who wish to extend the learning. During this lesson students will:

- Learn about the circulatory system
- Learn about the role of dietary fibre in both the digestive and circulatory systems by reading an [article](#) and an optional short [Fibre and whole grains response](#)
- Participate in a [game/body break](#) to solidify the benefits of including foods high in digestive fibre; this game can be used earlier in the lesson to break up the content or during Phys Ed

OPTIONAL EXTENSIONS:

- [Coding Connections Slides](#): If you have access to Ozobots and would like to integrate coding into your STEMterprise project, an Ozobot-Coding [Circulatory System Lesson](#) from [Science North](#) is added at the end of this lesson.
- A [Career Connections](#) about a dietitian fits in well with the lesson and is at

the end of the slides.

Time Frame: 60 min (excluding the Clogged Artery Game)

Career Connection

There is an optional Career Connection at the end of this and all lesson slides and in the [Career Connections Slides](#). Career: Dietitian.

Curriculum Expectations

Science & Technology - Strand B Life Systems

B2.1 identify body systems, describe their basic function

B2.2 describe basic structure and function of vital organs

B2.3 describe interrelationships between human body systems

Transferable Skills:

- Critical thinking
- Self-directed learning

Agriculture/Agri-Food:

- Learn about nutrition and grains
 - Learn how grains are good for heart health
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STEMterprise References for Educators

STEMterprise Webpage: <https://goodineverygrain.ca/ontario-farming-stemterprise/>

Video Links

- [Ontario Farming STEMterprise: Grade 5 Pizza Shop Business](#)
- [Students: Are you ready for your own pizza business?](#)

STEMterprise Teacher Support Resources

- [Ontario Farming Grade 5 Educator Information Packet](#)
- [STEMterprise Grade 5 Assessment Planning](#)
- [Project Overview](#)
- [Combined Grade Activities](#)
- [Career Connections Slides](#)
- [Coding Connections Slides](#)

- [Good in Every Classroom Education Blog](#)
- [Good in Every Classroom Newsletter Sign-Up](#)

Stage 2 | Lesson 3: Heart Health

Slide 5: Business Connection	This Business Connection slide is intended to get kids thinking about the learning ahead as it specifically relates to their pizza business. Encourage the students to make early connections about the learning goals and the connection to their business. At this initial stage of STEMterprise, students may not have any ideas to share yet. This can be a question for them to consider at this point. This question will come up in each lesson and they can make these connections further into the project. The simple signposts along the bottom give students a sense of where they are on their learning journey. You can note the number of stages and which lesson you're on in that particular stage.
Slide 6: Minds On!	This Circulatory System For Kids - Video is 8 minutes long and makes for a longer than usual Minds On; however it is comprehensive and an informative start to the lesson. To encourage active viewing, you might have the students use the 3, 2, 1 assessment doc to note 3 things they learned, 2 interesting things, and 1 question they have. A printable Assessment Planning can be found in the STEM 5 Assessment Document. You could also have students note a learning, wondering, or question on a post-it note. Video Option: If your students enjoyed the Digestive System video from Kids Health, you might instead consider their video about the circulatory system at this link.
Slide 7: The Circulatory System	The following 9 slides are for explicit/direct instruction about the circulatory system. You may consider front loading this lesson on how the circulatory system works.
Slide 8-10: The Heart	The heart is a powerful muscle that pumps blood around the body. Fun fact! A heart beats about 3 billion times during an average lifetime. Inside, the heart has four chambers: two atria and two ventricles Mammals have a double circulatory system. This means our circulatory system has two circuits: - One links the heart and lungs - The other circuit links the heart with the rest of the body

	This is a great opportunity to expand, using a variety of materials to show how oxygenated blood and deoxygenated blood travel through the body. If further clarification is needed, deoxygenate means “to remove oxygen from.” Deoxygenated blood on the right side is oxygen-poor while the oxygenated blood on the left side is oxygen-rich. More information: https://www.bbc.co.uk/bitesize/articles/ztg6gdm
Slide 11: Blood Vessels	Blood travels around the body in blood vessels. There are three types of blood vessels: arteries, veins and capillaries.
Slide 12: Arteries	Extension! You might consider an experiment to measure the flow of blood. https://www.sciencebuddies.org/stem-activities/blood-flow-model
Slide 13: Veins	Look at your wrists, where you can see some of your veins. They look blue or green! But the blood in them is not blue or green because blood is always red. Veins look like that because of the way skin absorbs light. Fat below the skin only allows blue light through. In diagrams, veins are shown as blue so you can tell them apart from arteries. Sources: Why do our veins look blue? - BBC Science Focus Magazine If Blood Is Red, Why Do Veins Appear Blue Through The Skin? » ScienceABC Note: Pulmonary veins carry oxygen-rich blood from lungs to heart, the only time veins carry oxygen-rich blood.
Slide 14: Capillaries	Capillaries are one cell thick. They link arteries and veins and exchange materials between blood and other body cells.
Slide 15: Blood	Extension idea! Check out this cool activity to make blood slime. https://royalbaloo.com/blood-slime-model-whats-in-our-blood/
Slide 16: What affects heart health?	It's time to make a connection to the pizza project. Tell students they need to consider ingredients to make sure they support a healthy body and heart.
Slide 17: What We Eat	Some types of fat are healthier than others. A diet high in saturated and trans fats can cause cholesterol to build up in your arteries (blood vessels). This puts you at risk for heart attack, stroke, and

	other major health problems. Educators: It is important to remember that no singular food, ingredient or nutrient found in a food can be a causing factor of heart disease, but rather an overall lifestyle, diet and the concentration of saturated or trans fat are contributing factors. Extension opportunity: Consider integrating discussion about healthy fats - check out this video! https://www.youtube.com/watch?v=GSCOzzOqEsc
Slide 18: Types of Fat	Use the table to have a class discussion. Which of these foods might be found in a pizza?
Slide 19: Grain Power!	Including whole grains and dietary fibre in your diet can: • Benefit heart health by helping to lower cholesterol • Lower high blood pressure • Reduce the risk of heart disease and stroke.
Slide 20: Dietary Fibre	Play this video as a review and continuation of their learning about fibre from Stage 2. For teachers: Background on Dietary Fibre, and Wheat - https://www.youtube.com/watch?v=12ztiKDMN84
Slide 21: Dietary Fibre (Activity)	Fibre and Whole Grains Article link. (10 minutes). An optional Fibre and whole grains response page has been provided for students to respond to the reading and write about how fibre prevents high cholesterol from building up. Connection to the circulatory system: This source directly makes the connection you're looking for. By stating that soluble fibre helps to lower blood cholesterol, it establishes a clear link to the circulatory system. You can build on this by explaining to your students that high cholesterol can clog up the body's "highway" (the circulatory system) and that fibre helps keep that highway clear and running smoothly. NOTE: Cholesterol is a waxy, fat-like substance found in your blood and cells, essential for building healthy cells and making hormones, but high levels can lead to plaque buildup in arteries, increasing the risk of heart disease and stroke

	In addition to reading the article, teachers can extend the activity and have students write <i>In your own words, how does dietary fibre prevent high levels of cholesterol from building up in the arteries?</i>
Slide 22-23: Connecting Systems (Activity)	https://www.teachengineering.org/activities/view/cub_biomed_leson03_activity1 Prompts to get students thinking: • What might help dietary fibre be absorbed or not absorbed in the system? • Does dietary fibre hurt or help the movement of waste in each system? We've learned that dietary fibre helps clear the intestines of cholesterol so it's not reabsorbed into our circulatory system to get stuck in our arteries. We know that dietary fibre helps our digestive system because it allows water to be absorbed and keeps our bile soft, but also that it passes through virtually unchanged (so gives it some structure). Working as a class, let's fill out this chart to solidify our understanding of dietary fibre to our health. https://www.teachengineering.org/activities/view/cub_biomed_leson03_activity1 We've learned that dietary fibre helps clear the intestines of the cholesterol so it's not reabsorbed into our circulatory system to get stuck in our arteries. We know that dietary fibre helps our digestive system because it allows water to be absorbed and keeps our bile soft, but also that it passes through virtually unchanged (so gives it some structure). Working as a class, let's fill out this Venn diagram to check our understanding of dietary fibre to our health.
Slide 24: Clogged Artery Game (Activity)	Game Source: American Heart Association Have students play actively for a few minutes then take their pulse. Play for a few more and take it again. You may want them to graph their heart rate to show how physical activity directly affects the circulatory system as well! Use these question to consolidate the game: 1. What do the hula hoops with students represent?

	2. Why is exercise so important? 3. What is another way to reduce cholesterol? 4. Is exercise good for the heart? 5. Why is having a healthy heart important?
Slide 25: Wrap Up	Use a THINGS TO CONSIDER chart for your class. Provide students with sticky notes, one per business group or pair. Have them add one thing they need to remember (in relation to this lesson) as they develop their pizza business. This is a great time to review what they have learned ie. that a person's diet contributes to their heart health, that our body systems are connected, fat can hurt our bodies, and that fibre can support both circulatory and digestive systems. As well as: • If we eat too much cholesterol, excess is dumped into our intestines. • If we don't have enough dietary fibre to clear it out of the way before it's reabsorbed, our arteries get clogged. • Whole grains, fruits & vegetables are examples of foods high in dietary fibre. How can we reduce fat, increase fibre and still make our pizza yummy? What toppings may we need to consider and which can we increase or substitute?
Slide 26: What's Next?	The "What's Next?" slide is intended to be flexible and may be customized or filled in by teachers based on their classroom needs, pacing, and next steps.
Slide 28: Career Connection	See AgScape link for career profile. Career: Dietitian.
Slide 30: The Circulatory System with Ozobots	See Science North Ozobot Circulatory System Lesson Teachers can choose to use the same lesson for the students to model the digestive system using an Ozobot