

A Note to Teachers



In this lesson, students will explore the circulatory system and learn about the role of dietary fibre in the digestive and circulatory systems.

Time: approximately 60 minutes (excluding the Clogged Artery Game)

This includes:

- Learning about the circulatory system
- Learning about the role of dietary fibre in both the digestive and circulatory systems by reading an [Fibre and whole grains article](#) and an optional short [Fibre and whole grains response](#)
- 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 the [Circulatory System Lesson](#) from [Science North](#) is added at the [end of this lesson](#).
- A [Career Connections Slides](#) about a Dietician fits in well with the lesson and is at the [end](#) of the slides.

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





Stage 2 Lesson 3 Heart Health



Learning Goals



We are learning to:

- 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.



Business Connection

How will this learning help our business?

**WE ARE
HERE**
Lesson 3 of 3

Stage 1
Starting a
Business

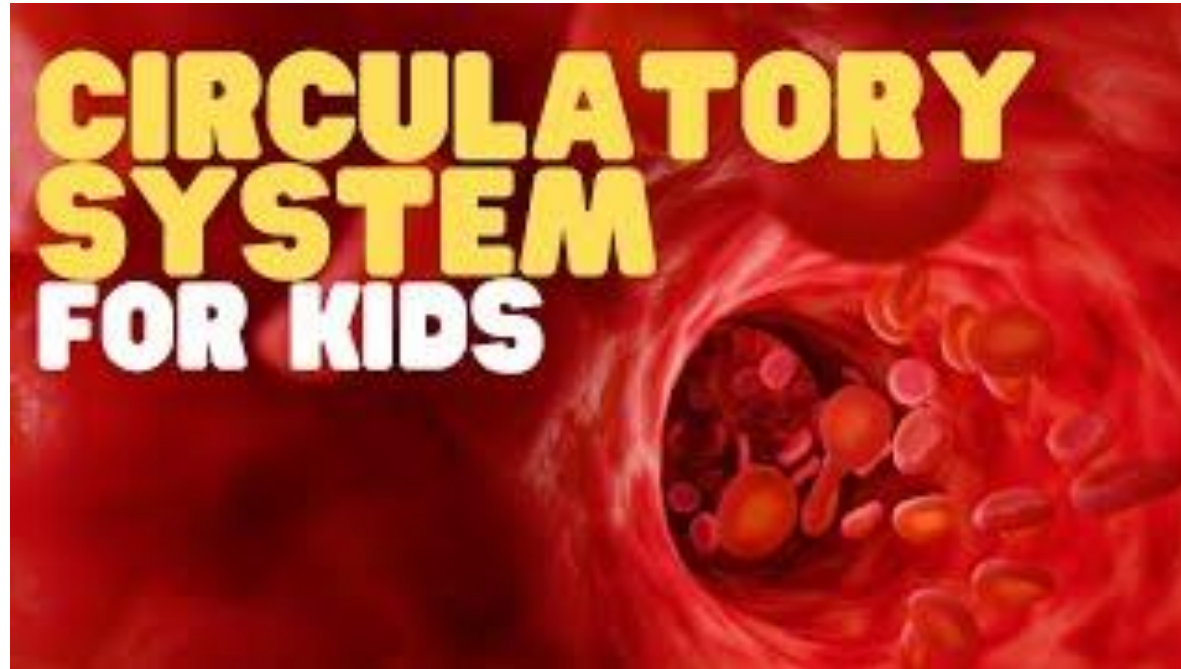
Stage 2
Food & Our
Body

Stage 3
Market Research
& Business Plan

Stage 4
Food Systems
& Farming

Stage 5
Create & Pitch

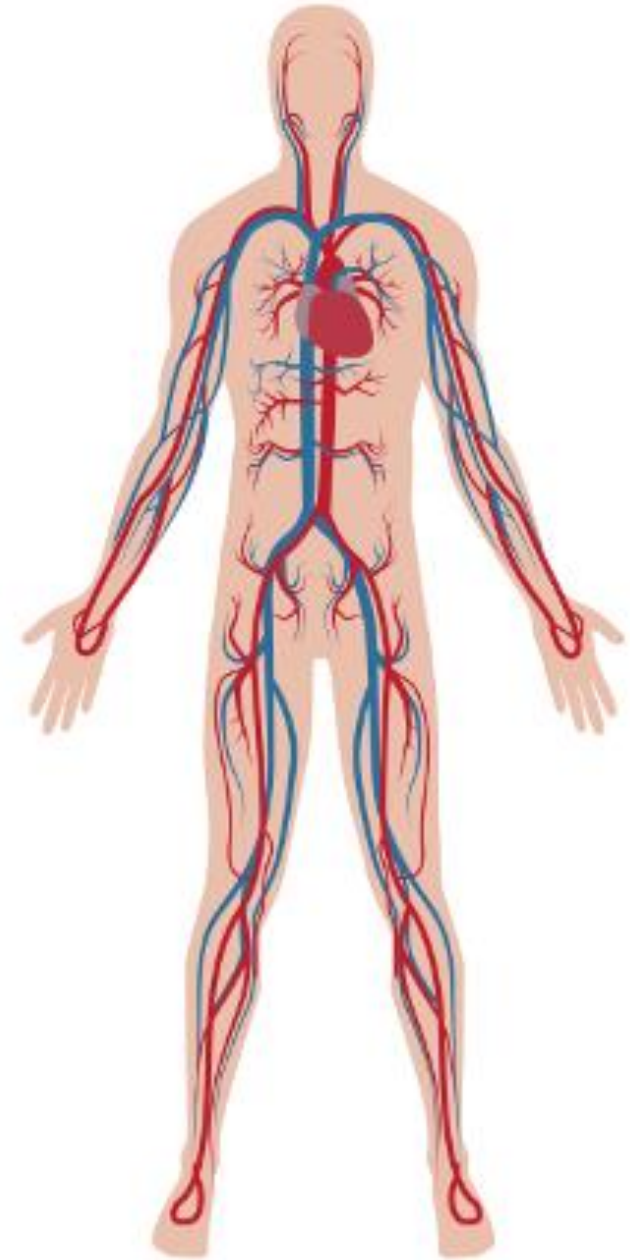
Minds ON!



The Circulatory System

The circulatory system is made up of the heart, blood and blood vessels.

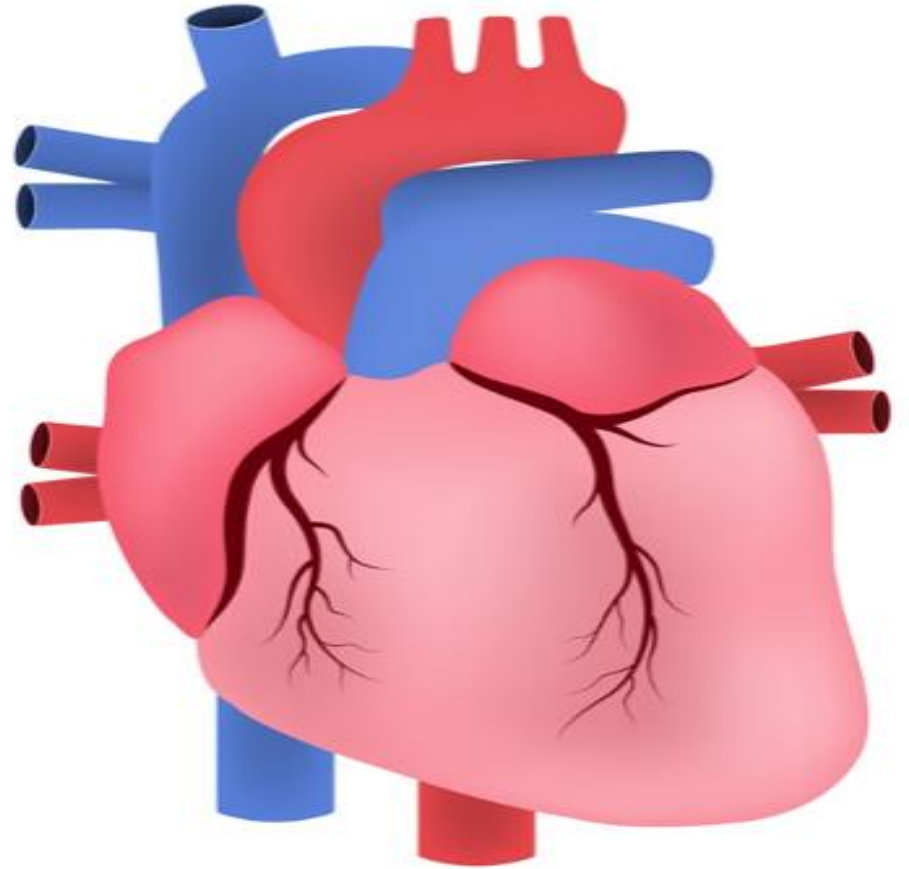
It is responsible for carrying blood and dissolved substances throughout the entire body.



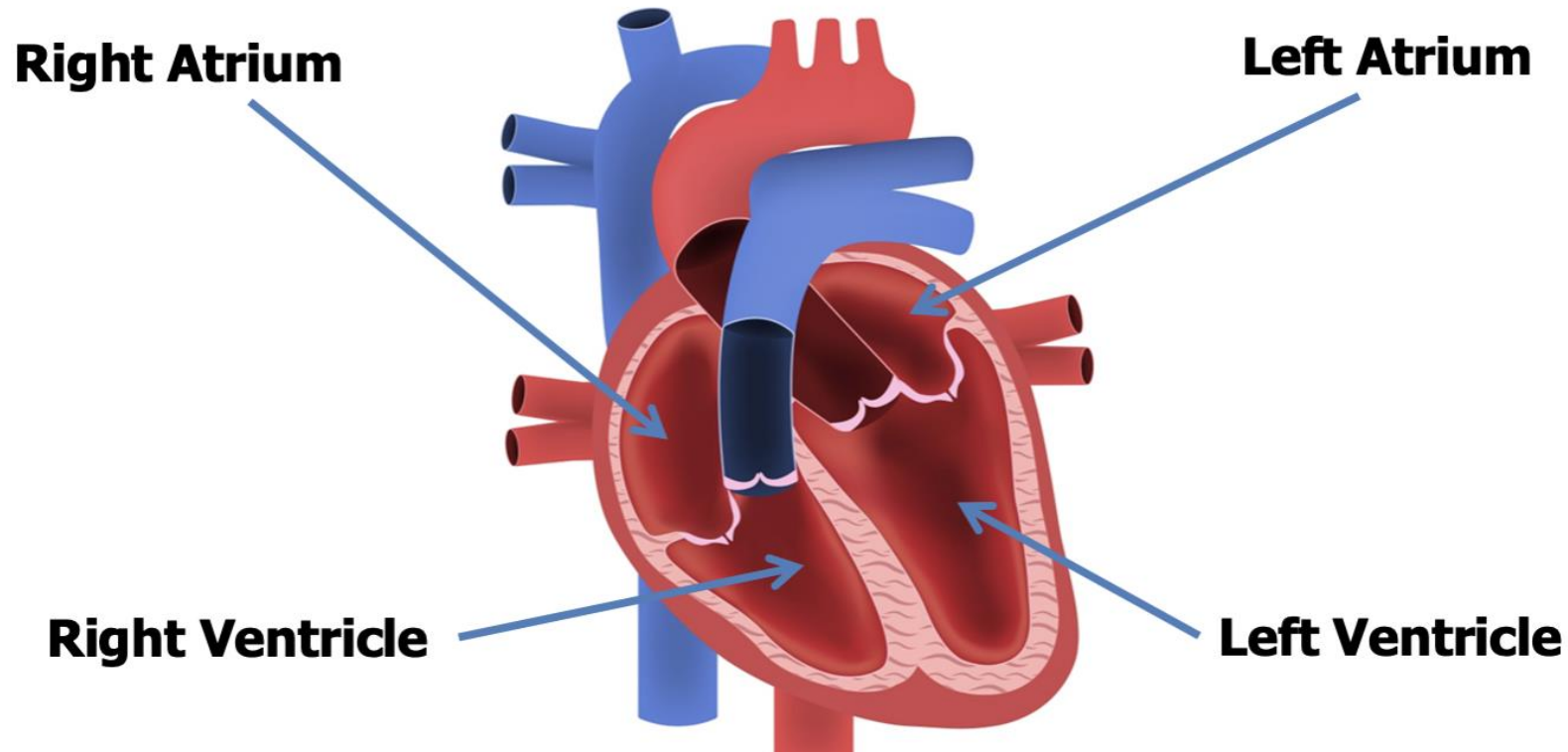
The Heart

The heart is a powerful muscle that pumps blood around the body.

A heart beats about 3 billion times during an average lifetime.



The Heart



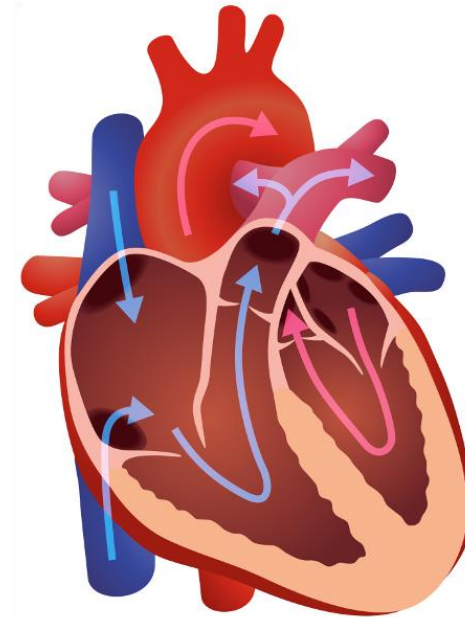
Inside, the heart has four chambers: two atria and two ventricles

The Heart

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

The right side receives deoxygenated blood from the body and sends it to the lungs to collect more oxygen.



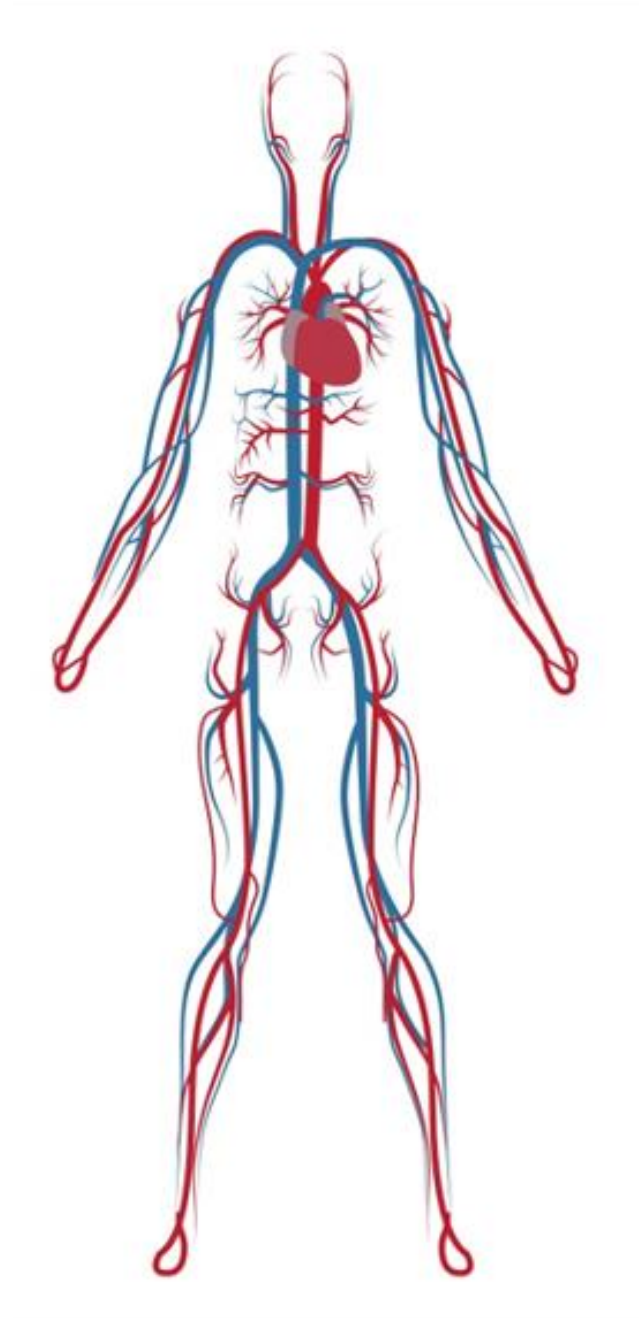
The left side receives oxygenated blood from the lungs and pumps it around the rest of the body.

Blood Vessels

Blood travels around the body in blood vessels.

There are three types of blood vessels:

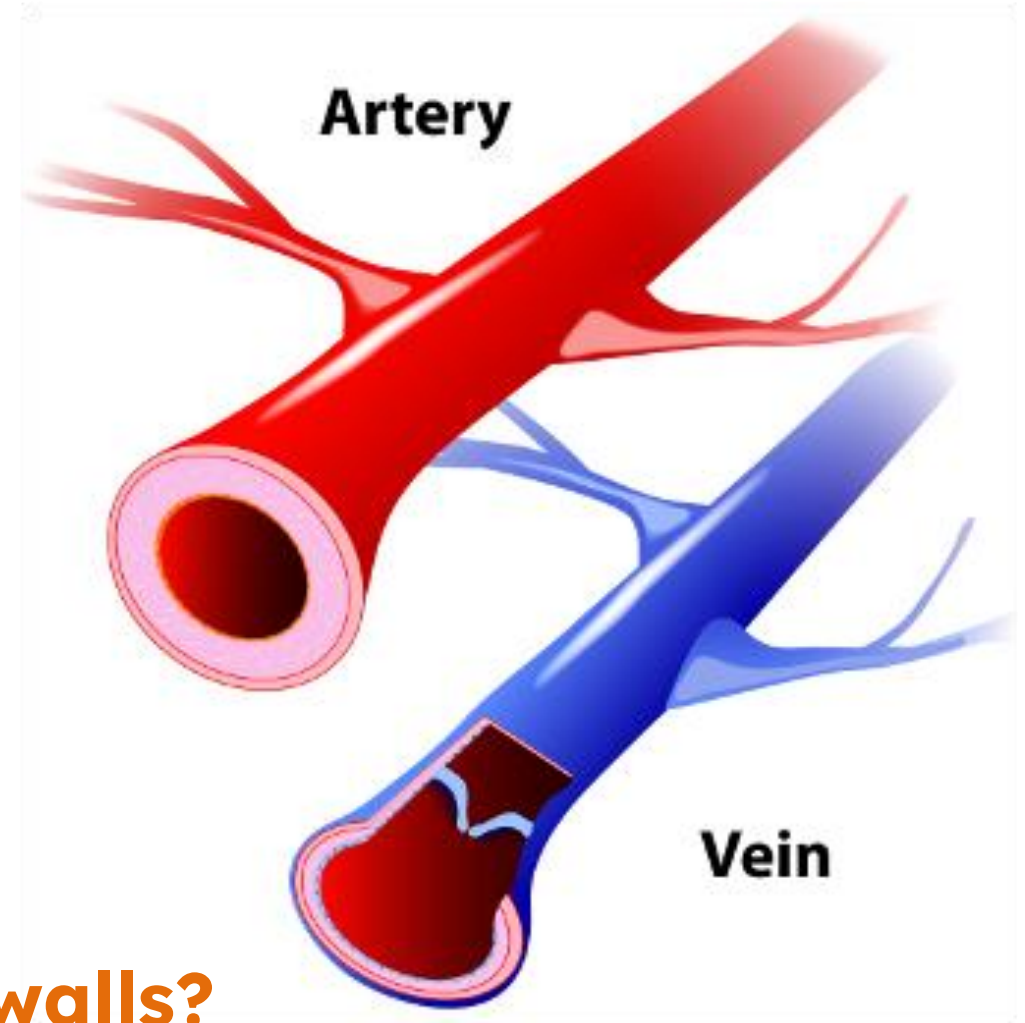
- Arteries
- Veins
- Capillaries



Arteries

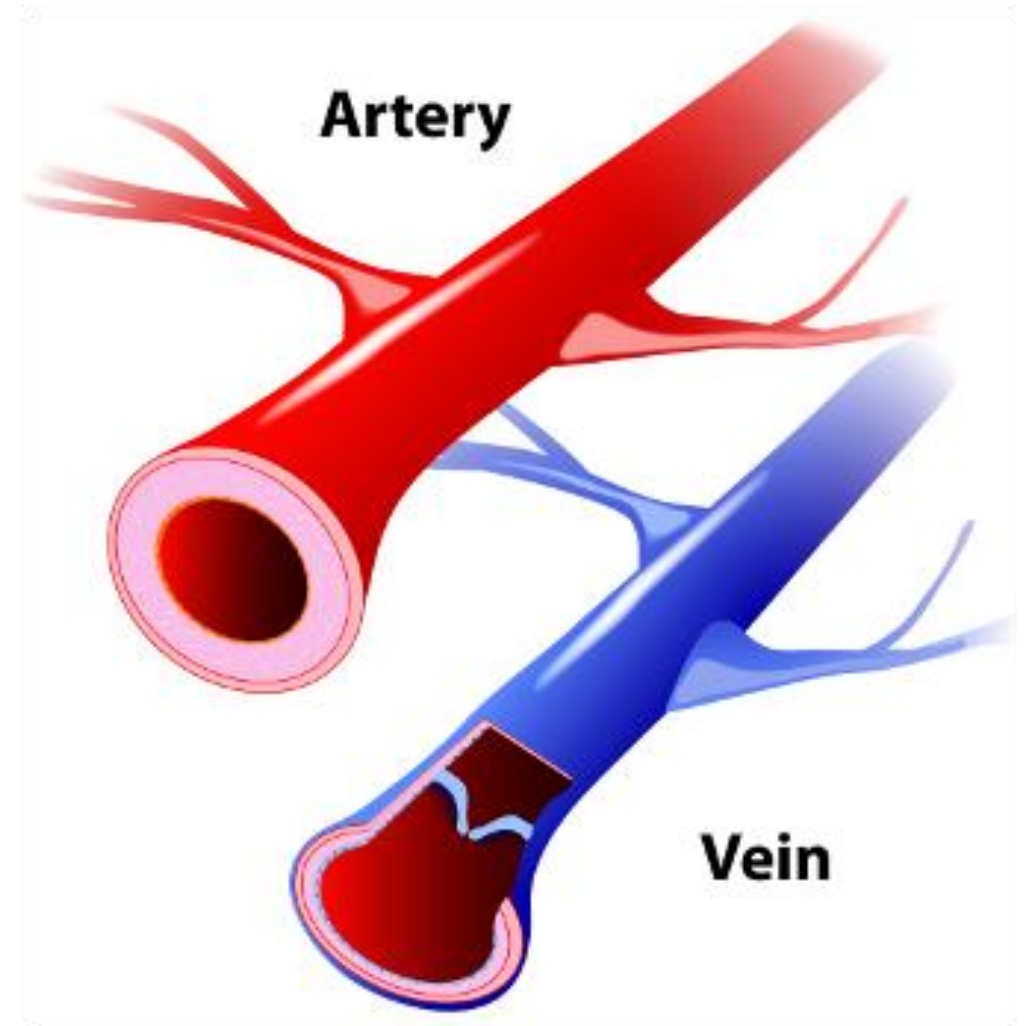
Arteries carry oxygenated blood away from the heart and around the body. They have thick, elastic walls so they can carry blood under pressure.

Why do they need such strong walls?



Veins

Veins carry deoxygenated blood back to the heart. They have valves to stop the blood from flowing in the wrong direction.

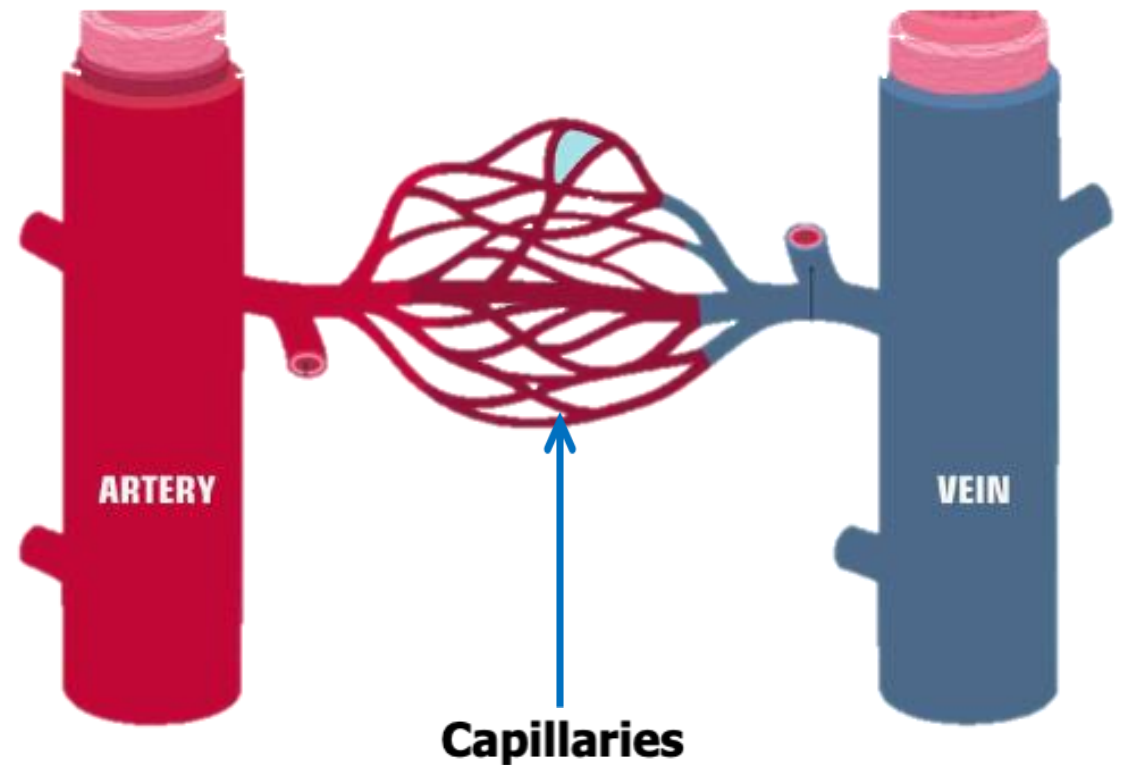


Why do veins need valves to stop the blood?

Capillaries

Capillaries are one cell thick.

They link arteries and veins
and exchange materials
between blood and other
body cells.

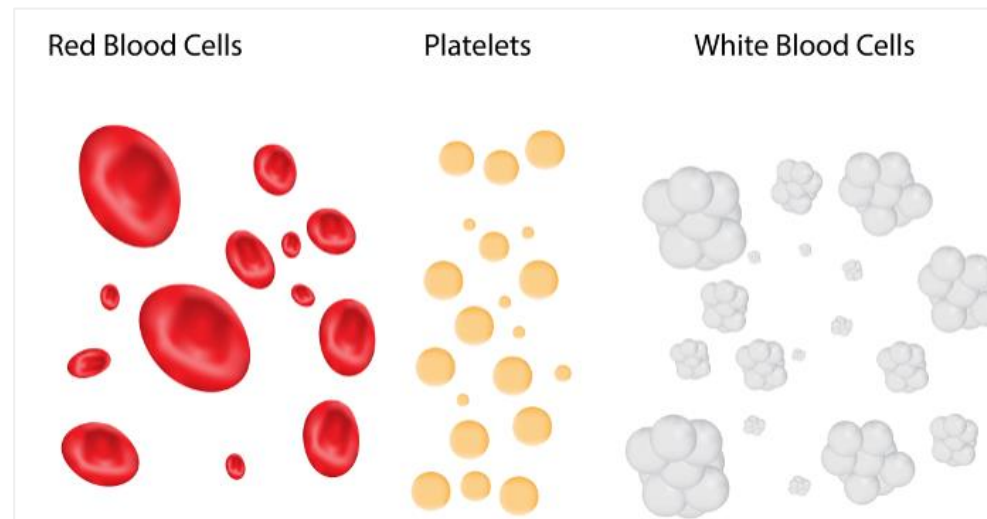


Blood

Blood carries substances around the body.

It is made up of the following elements:

- **Red blood cells:** transport oxygen
- **White blood cells:** protect against disease
- **Platelets:** repair cuts by causing blood to clot
- **Plasma:** a liquid that transports nutrients, red and white blood cells and platelets

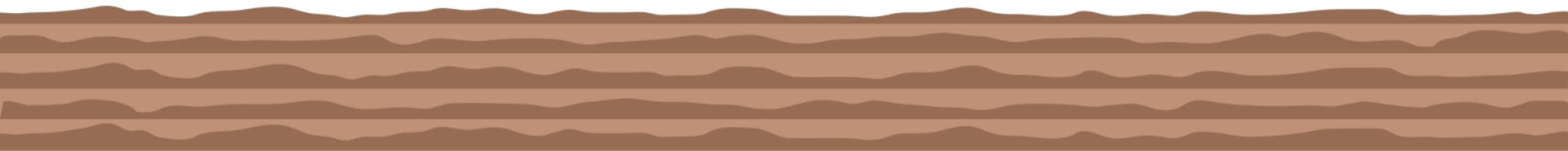


What affects heart health?

There are several factors that affect heart health:

- Lifestyle choices like diet, exercise and smoking
- Medical conditions like high blood pressure, high cholesterol and diabetes

Why do we need to consider these factors when developing our pizza shops and the food we will offer?

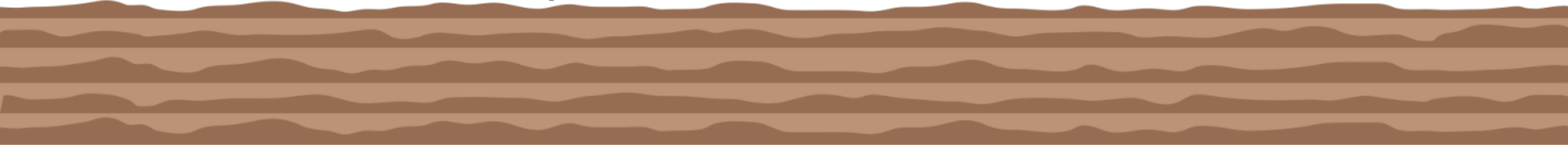


What We Eat

A diet high in **saturated** and **trans** fats can cause cholesterol to build up in your arteries.

Cholesterol is a waxy substance found in blood that will build up over time and eventually make it difficult for blood to travel through your arteries.

This could put you at risk for heart attack, stroke or other major heart health problems.



Types of Fat

Unsaturated Fats

Mainly found in plants and fish, such as:

- . olive oil, canola oil and spreads made from these oils
- . avocados
- . some nuts, like almonds, Brazil nuts, peanuts
- . salmon, sardines and tuna



Saturated Fats

Mainly found in animal products and some plant foods, such as:

- . fatty meat and meat products, such as sausage, pepperoni, bacon
- . butter, including ghee, and lard
- . cheese, cream, sour cream, ice cream
- . chocolate, cookies, cakes, pastry
- . palm oil and coconut oil



Which of these foods or ingredients might be found in a pizza?

Grain Power!

Including whole grains and dietary fibre into your diet can:

- Benefit heart health by helping to lower cholesterol
- Lower high blood pressure
- Reduce the risk of heart disease and stroke.



cholesterol
buildup in
arteries



Dietary Fibre

Let's
review!

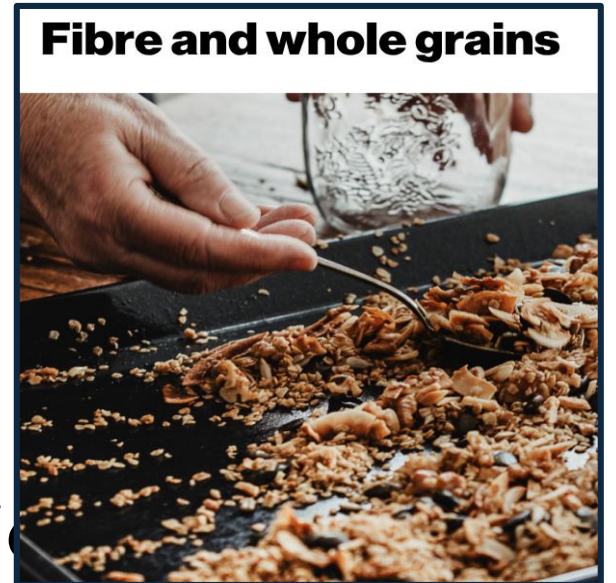


Action 1: Dietary Fibre

We have learned that dietary fibre is important to the digestive system. It also plays an important role in the circulatory system.

Let's think about how!

1. Read the [Fibre and Whole grains article](#)
2. Think about how fibre prevents high cholesterol from building up in the arteries



Connecting Systems

Let's work as a class to fill in this chart to see how dietary fibre benefits both the circulatory and the digestive systems.

Circulatory System



Dietary Fibre

Digestive System

What is similar? What is different?

Connecting Systems

Let's work as a class to fill in this chart to see how dietary fibre benefits both the circulatory and the digestive systems.

Circulatory System

prevents cholesterol from being reabsorbed
reduces stroke, heart attack and heart disease
prevents clogs
improves health



Dietary Fibre

Digestive System

helps absorb water
allows food and water to move through
prevents clogs (constipation)
improves health

What is similar? What is different?

Action 2: Clogged Artery Game

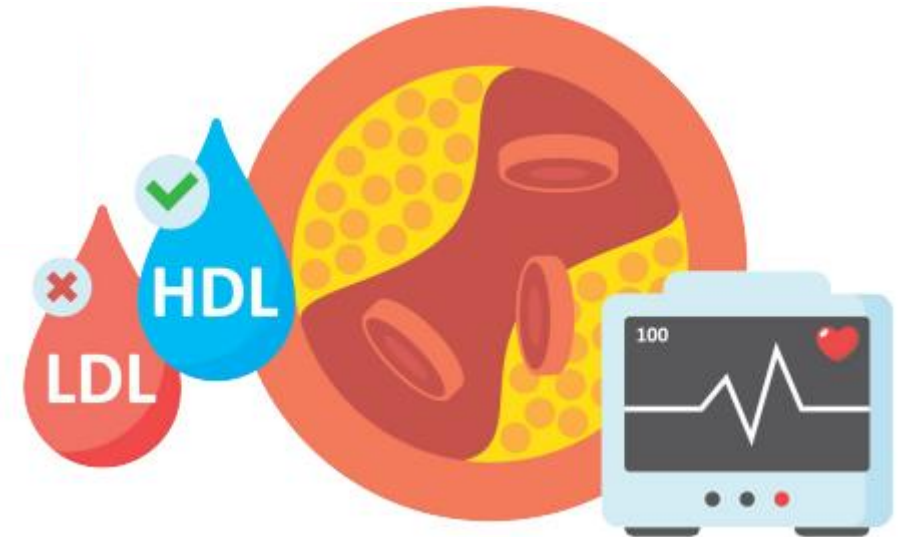
Materials Needed:

5 pinnies, 2 or 3 red hula hoops

Choose 2-3 students to be the taggers (they are saturated fats). These students wear one colour of pinnie. Choose 1-2 students to be fibre (they wear a different colour pinnie.. Place 2 or 3 red hula hoops in the playing area to represent an artery.

If a student is tagged, he/she becomes a piece of cholesterol and goes over to an artery. When there are 3 pieces of cholesterol in an artery (this means it is clogged), the students can be freed by a fibre standing in the middle of the hoop.

Change taggers every few minutes and do a pulse check.



Wrap Up

Now we know a lot about the circulatory system and the importance of making healthy food choices!

As it relates to the circulatory system,

what do we need to consider when
our pizza business?



Write it on a sticky note and put it on the class chart.



Check In – What's Next?





Career Connections



Dietitian

I help people choose foods that fit with their lifestyle, their beliefs, and reconnect people with the basic understanding of how food fuels the body.

Chrissa Karagiannis





Coding Connections



The Circulatory System

Let's use Ozobots



Your Task: Create a model of the circulatory system with paths for your Ozobot to follow.

