DEPARTMENT OF HEALTH

Lesson 5 Activities: Cardiovascular and Nervous Systems

ENGLISH LANGUAGE LEARNERS (ELL) HEALTH CURRICULUM

Glossary

Cardiovascular System

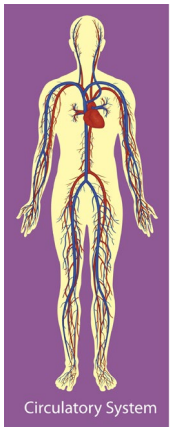
- **Blood:**
  Fluid that carries oxygen, nutrients, waste, and water to and from the cells in your body.
- **Blood pressure:**
  The strength of your blood pushing on the sides of your blood vessels as it moves through them.
- **Blood vessels:**
  Tubes that carry blood through your body.
- **Heart:**
  A very strong, muscular organ that works like a pump to move blood through your body so that blood can then carry oxygen and nutrients to all your organs to keep you alive.
- **Heart attack:**
  A medical emergency that happens when blood flow to the heart is blocked, which prevents oxygen from getting to part of the heart.
- **Hypertension:**
  When your blood pressure is too high for too long, which can eventually cause problems in your blood vessels, heart, and kidneys.
- **Platelets:**
  Small cell pieces that help blood to clot and stop bleeding when the body gets a cut or when a blood vessel breaks.
- **Red blood cells:**
  Cells in your blood that carry oxygen from your lungs to all parts of your body.
- **Stroke:**
  When there is not enough blood and oxygen going to the brain.
- **Symptom**:
  A sign (like fever, pain, or dizziness) that you may be sick with a certain type of illness.
- **White blood cells:**
  Cells in your blood that help protect your body from infection.

Nervous System

- **Brain:**
  Part of the body that controls everything the body does.
- **Involuntary action:**
  An action that happens without thinking, like digesting food.
- **Nerves:**
  Groups of neurons that carry signals between your brain and other parts of your body.
- **Neurons:**
  Special nerve cells that send and receive signals throughout the body.
- **Voluntary action:**
  An action you control by thinking, like kicking a ball.

Reading Comprehension

Cardiovascular System



The cardiovascular system's purpose is to circulate blood throughout the entire body. It is made up of the **heart** and **blood vessels**. The heart is a very strong muscle that pumps blood throughout the body. Blood vessels are the tubes that carry blood throughout the body.

Blood carries oxygen, nutrients, waste and water to and from cells in the body. There are three types of blood cells: red blood cells, white blood cells, and platelets. **Red blood cells** carry oxygen to the rest of the body and carry back carbon dioxide to the lungs. **White blood cells** help the body defend against infections. **Platelets** are small cell pieces that help blood to make clots and stop bleeding when the body gets a cut or when a blood vessel breaks. This is what creates scabs.

Blood pressure

All human body cells need blood to survive. The heart pumps blood throughout the body to support life. **Blood pressure** is the strength of blood pushing on the sides of blood vessels as it moves through them.

Analogy: Think of a pipe with water running through it.

- *Normal pressure:* steady and normal amount of water flows through the pipe.
- *Low pressure:* only a trickle of water runs through the pipe.
- *High pressure:* if the pipe is blocked, then it will begin to leak, or maybe even break, because the water pressure is too high.

What is high blood pressure?

High blood pressure means there is too much force in the blood vessels, making your heart work harder to pump blood. **Hypertension** results when blood pressure is too high for too long. Without treatment, hypertension can cause problems in the blood vessels, heart, and kidneys.

Why is high blood pressure prevention and treatment so important?

High blood pressure can weaken organs or limbs, as muscles can become weak from working too hard (like when your legs feel tired after walking for a long time).

- Heart disease: can occur when continuous high blood pressure weakens the heart's blood vessel walls, causing long-term damage and risk of medical emergencies.

High blood pressure can also increase the risk of clogged or burst vessels, which can cause serious medical conditions and emergencies like stroke and heart attack.

Heart attacks are when blood flow to the heart and oxygen cannot get to the heart. Symptoms[1] include chest pain, shortness of breath, and pain in the jaw, back, arm, or shoulder. Women may also experience nausea, light-headedness, and sudden tiredness.

Strokes are when not enough blood and oxygen go to the brain. Symptoms include sudden numbness in the face, arm, or leg (especially on one side, sudden confusion or trouble speaking, sudden trouble seeing in one or both eyes, sudden trouble walking, and dizziness.[2]

Talk with a partner

Answer these questions based on the readings.

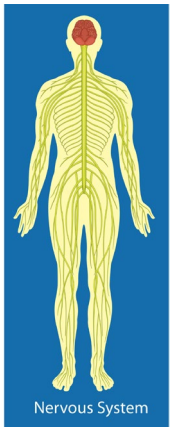
1. What are three types of blood cells?
2. What is blood pressure?
3. Why is it important to prevent or treat high blood pressure?

[1] CDC: Heart Attacks (www.cdc.gov/heart-disease/about/heart-attack.html)

[2] CDC: Stroke (www.cdc.gov/stroke/signs-symptoms/index.html)

Why is the nervous system important?[3]

The nervous system controls the body through voluntary and involuntary actions. It allows you to move, think, and act.



- **Voluntary action**:
  A voluntary action is an action you control. If you want to kick a ball, your brain sends a message to your leg to kick the ball.
- **Involuntary action**:
  An involuntary action happens without thinking. For example, you don't have to tell your body to digest food.

How the nervous system works

Neurons: Special cells (also called nerve cells) that receive and send signals through the body.

- *Analogy*: *A neuron is like a phone wire that receives and sends messages.*

Nerves: Groups of neurons that create a pathway for signals to travel between your brain and body.

- *Analogy: Nerves are like a bundle of phone wires that work together to receive and send messages.*

Brain: The brain is very important in the nervous system and in the body. It controls everything the body does. Without the brain, the body cannot work or survive.

Each part of the brain controls a specific part of the body. If a part of the brain is hurt (a head injury or stroke, for example), other parts of the body may not work.

Write a short answer based on the reading.

1. **What is a neuron?**

   _____

   _____

   _____

2. **What are nerves?**

   _____

   _____

   _____

3. **Why is the brain an important part of the body?**

   _____

   _____

   _____

Critical thinking skills

Think about the question. Talk about the answer with a partner. Write a brief paragraph to answer the question.

Describe the difference between voluntary and involuntary actions.

_____

_____

_____

_____

[3] Interactive Biology: An Introduction to the Nervous System (http://www.youtube.com/watch?v=NL1S0AhYyFw)

Vocabulary Card Match

HEART	**HEART ATTACK**	A very strong muscle that pumps blood through the body	Heart does not get enough oxygen
BRAIN	**BLOOD VESSELS**	Part of the body that controls everything the body does	Tubes that carry blood through the body
BLOOD	**RED BLOOD CELLS**	Fluid that carries oxygen, nutrients, waste, and water to and from body cells	Carry oxygen back to cells
WHITE BLOOD CELLS	**PLATELETS**	Help the body defend against infections	Help plug up the hole when a blood vessel breaks
STROKE	**HYPERTENSION**	Lack of blood flow and oxygen to the brain	When there is too much force in the blood vessels (also known as high blood pressure)

Copy the words and their definitions after you match all the cards.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

Conversation

SCENARIO: Faduma is at the doctor's office for a normal checkup. The nurse is concerned because Faduma's blood pressure shows that she has pre-hypertension. Normal blood pressure is less than 120/80.

Nurse: **Hello, Faduma. I am concerned that your blood pressure is a little higher than normal. We call this pre-hypertension, because you are at risk of getting hypertension (consistently high blood pressure). However, your blood pressure is not high enough to be called hypertension yet.**

Faduma: Oh, no. That's not good. I had no idea!

Nurse: **That is normal – most people don't. There are no obvious symptoms of hypertension.**

Faduma: Why is my blood pressure higher now than it used to be?

Nurse: **Your blood pressure may go up as you get older. It can also be impacted by the way you eat, how active you are, how much stress you have, how much sleep you get, and family health history. There are many reasons your blood pressure might go up, which is why we suggest getting your blood pressure checked often.**

Faduma: Yeah, I'm not very young anymore. Is there anything I can do to prevent it from getting worse?

Nurse: **Eating more fruits and vegetables is good and so is getting 30 minutes of physical activity a day.**

Faduma: I know. But it's hard to find the time to exercise.

Nurse **We can work together to set an exercise goal for you, Faduma.**

Faduma: Thanks! I'd like that.

Talk with your partner and write a short answer to the following question.

What did the nurse recommend for Faduma to improve her blood pressure?

_____

_____

_____

_____

_____

_____

Quiz

Read the questions. Then circle A, B, C or D.

1. What is in blood?
   a. Red blood cells
   b. White blood cells
   c. Platelets
   d. All of the above

2. Which of the below are involuntary actions?
   a. Kicking a ball
   b. Digesting food
   c. Reflexes
   d. Both B and C

3. The nervous system…
   a. …controls only voluntary actions.
   b. …is the control center of the body.
   c. None of these
   d. Both A and B

4. How can you prevent high blood pressure?
   a. Smoke
   b. Diet and smoke
   c. Become overweight
   d. Eat a healthy diet, exercise, and don't smoke

5. Blood pressure is…
   a. …the force inside your blood vessels.
   b. …the force inside your bones.
   c. …cholesterol in your veins.
   d. …kidney disease.

6. High blood pressure can lead to a stroke or heart attack.
   a. True
   b. False

7. Which of the following is a normal blood pressure?
   a. 130/83
   b. 141/92
   c. 115/80
   d. 129/89

8. Write 3 things you can do to prevent high blood pressure.

   _____

   _____

   _____

   _____

   _____

Student Survey: Cardiovascular and Nervous Systems Unit

1. Did you learn more information about cardiovascular health from studying this lesson?

1	2	3	4	5
no		some		yes

2. Would you share this information with family and friends?

1	2	3	4	5
no		maybe		yes

3. After studying this lesson, are you more likely to ask your healthcare provider about hypertension?

1	2	3	4	5
no		a little		yes

4. Do you know where to find more information about cardiovascular health if you have more questions

1	2	3	4	5
no		maybe		yes

5. Do you know where to find more information about health insurance if you have more questions?

1	2	3	4	5
no		somewhat		yes

6. Did you like the class activities?

1	2	3	4	5
no		somewhat		yes

We value your opinions! Could you tell us what you liked or give us suggestions on how to improve this lesson?

_____

_____

Thank you!

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