

Grade 5 Human Health and Body Systems Review Lesson – “Mystery Organ”

Lesson Overview

This activity allows students to build deeper and more meaningful connections between the six systems in the human body with the five vital organs as the focus. Students will work through the six systems to determine their “mystery” vital organ. In the end, students will work together as a class to determine how all the vital organs are interconnected to allow the six systems to function properly. This lesson is designed to be incorporated as a formative activity for the students. This lesson can be taught at the end of the unit, to consolidate their learning of the Human Health and Body Systems unit.

This lesson will take approximately 75 minutes. Teachers can choose to add extension questions to this lesson, which may take longer than 90 minutes.

Curriculum Expectations

OE A3. Applications, connections and contributions

SE A3.2 investigate how science and technology can be used with other subject areas to address real-world problems

SE A3.3 analyze contributions to science and technology from various communities

OE B1. analyze the impacts of various social and environmental factors, human activities, and technologies on human health

SE B1.1 assess the effects of a variety of social and environmental factors on human health and describes ways in which individuals can reduce the harmful effects of these factors and take advantage of those that are beneficial

SE B1.2 evaluate the beneficial and harmful effects of various technologies on human health and body systems, while taking different perspectives into consideration

OE B2. demonstrate an understanding of the structure and function of human body systems and interactions within and between systems

SE B2.1 identify systems of the human body and describe their basic function

SE B2.2 describe the basic structure and function of vital organs in various systems in the human body

SE B2.3 describe interrelationships between human body systems

SE B2.4 identify various diseases and medical disorders in humans and the organs and/or body system or systems that they affect

Learning Goals

- Understand the interrelationships between the human body systems and vital organs
- Understand the interrelationships between the different human body vital organs
- Demonstrate how social and environmental factors can affect vital organs and the human body systems
- Identify how technology can be beneficial to human health
- Work collaboratively to determine the unknown organ

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Instructional Components and Context

Readiness

- Prior knowledge of the six human systems and their independent functions
- Prior knowledge of the five vital organs and their independent functions
- Some knowledge of the technology used in the health field for common illnesses and diseases

Material

- 5 different coloured cards (7 of each colour)
- Cards that resemble a 2-piece puzzle for each terminology and definition
- Student worksheet template
- Teachers can have manipulatives that they used to represent each system throughout the unit
- 5 different colours of yarn (match the organ colours)
- Class size “Vital Organ Web” template
- Tape

Terminology

Digestive system	Muscular system	Skeletal system	Vital organs	Brain
Nervous system	Circulatory system	Respiratory system	Heart	Kidney
Liver	Lungs	Disease	Interconnected	

See the “Teacher Guide” section for terms and definitions.

Safety

This lesson does not include any materials or activities that may pose a safety issue. Students will need to conduct themselves in a regular and safe classroom.

Minds On (Approx. 10 mins)

The teacher will prepare 2-piece puzzle pieces for each of the important terminology outlined for this lesson (see the “Teacher Guide” section for examples). One piece will contain the word and the other will contain the definition. Each student will receive one puzzle piece. If there are fewer students than puzzle pieces, the teacher can decide if they want to remove some terminologies and review those as a whole class after or provide some students with 2 puzzle pieces. If there are more students than puzzle pieces, teachers can decide if they want students to work in pairs or have duplicate puzzle pieces. Students will be provided 2-5 minutes to find their puzzle piece partner. One partner will have the term and the other partner will have the definition that matches the term. Once all the students have found their partners, each group will share their word and the definition.

Connections

Assessment for Learning

This activity will assess students' understanding of the key terminology.

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Differentiated Instructions

Students can complete this task in pairs (1 puzzle piece per pair) to allow students extra support. Pictures can be added to the puzzle pairs for students that require a visual aid and for English Language Learners.

Action (Approx. 55 minutes)

Students will be placed into 5 equal groups. Each group will be assigned a different colour card with a number from 1-5 (to represent each vital organ) on it. This number and colour will correspond with the number and colour card at each station. There will be 6 stations, each representing a different human body system. Teachers may choose to include a diagram or model of the system corresponding with the stations (e.g. a picture of the muscular system at the muscular system station). Each group will start at a station and rotate through the different stations. Each group will spend 2-5 minutes (the teacher can decide based on their students) at each station before rotating. As the students move through the different systems, they will fill out their "Mystery Organ Worksheet" (attached in the "Teacher Guide"). Students will only read the card that matches the number and colour they were given at the beginning of the activity.

For example:

- Group 1 -> Yellow Card -> Vital Organ: Brain
- Group 2 -> Blue Card -> Vital Organ: Heart
- Group 3 -> Green Card -> Vital Organ: Kidney
- Group 4 -> Red Card -> Vital Organ: Liver
- Group 5 -> Orange Card -> Vital Organ: Lung

The station numbers and clues are provided at the end of this lesson. This can be used to create the stations. *See the "Teacher Guide" section for examples.*

Once the students have moved through all 6 stations, the groups will have to guess which vital organ they have, based on the clues provided.

Students will reflect on their learning through conversations within their groups. Students will reflect on the following: "What knowledge have we gained at this point", "What do we want to know more about" and "What improvements or changes can we make to our charts". The teacher will provide these questions on the board or a location that all the students can refer to. This will be completed, before the class discussion.

After students have guessed their vital organ, teacher will allow the students time to have a 3–5-minute discussion with students from other groups by moving throughout the classroom. Some discussion questions are: "How does your vital organ work with the other vital organs?" and "How does your vital organ interrelate with other vital organs through the different human body systems?". This will allow students an opportunity to see how each organ is interconnected. After the students have had their discussions, they will regroup in their original organ group. Each group will discuss how and why their organ relates to the other organs for about 2 minutes. After, one student from each group will fill in their group's learning on a class-

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size “Vital Organ Web” (teacher will provide). Each group will get yarn that matches the colour of their organ. One student will take a piece of yarn and connect the organs that are interconnected. On the line of the yarn, the student will write a brief explanation as to why they connect. Students will be creating a web. Once the students have completed this task, a class discussion can be held based on what they have written on the web. This may look congested; however, students will recognize that everything is interconnected. This will lead into the consolidation portion.

Connections

Assessment for and as Learning

The teacher can take anecdotal notes based on observations and discussions students have throughout the activity. As the teacher circulates between groups, the teacher can be making observations of students based on the learning goals outlined. Students will be completing an informal self-check assessment, based on their learning through their discussion within their groups. See the “*Teacher Guide*” section for example templates.

Differentiated Instructions

Students will be working in groups for this activity to ensure all students are supported. Teachers can make a mindful decision when determining groups for this activity to ensure all students’ needs are supported. This can also be done when deciding which groups get which “mystery organ.” Students that require scaffolding and visual aids, can be provided with resources if needed.

Consolidation (Approx. 10 minutes)

The teacher can choose to have students remain in their groups or have them return to their seats to complete the consolidation portion. As a class, the teacher can have an open conversation about how vital organs can be affected if someone has a disease or illness. Students will have a class discussion and will also discuss technology that exists to help individuals with these diseases or illnesses. This can be used as an extension, inquiry, assignment (outlined in the lesson below). Students will also discuss environmental and social factors that may affect this disease or illness. Teachers can discuss actions that can lead to complications that can cause harm to certain vital organs. An example of a disease that teachers can discuss is a heart attack. *Disclaimer: The teacher will need to know their students and families to ensure that this is not a sensitive or triggering topic for any students in the class. If it is, choose a different disease.* The following questions can be used for this follow up discussion:

- “How would a heart attack affect my vital organs?”
- “What is the main vital organ that is affected by someone having a heart attack?”
- “What are some environmental or social factors that can cause a heart attack?”
- “Is there any technology that you know about that can reduce or help individuals who may have suffered a heart attack?” How can this technology help to prevent heart attacks or ensure an early diagnosis?

Through these conversations, students will build a deeper understanding of the vital organs, its effects on human body systems, the impacts of diseases, how social and environmental factors

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affect our health and how technology can help our bodies with diseases. Students may not know all the answers but encourage conversations and challenge their thinking.

Students can complete the worksheet for homework based on: their learning from the stations, the class discussion, and their own mini research (if they would like). Have students submit the worksheet during the next class, which can be used as a “product” portion for the teacher.

See the *“Teacher Guide” section* for some anticipated responses.

Connections

Assessment as Learning

Through this consolidation piece, students may be building on their knowledge or sharing what they know. This portion is designed to be a safe and informal experience for all students. Students will recognize the interrelationships, causes and effects of a healthy system and healthy vital organs vs. unhealthy ones. This is also a discussion which will allow students to make real-life connections to science and technology. Throughout the lesson, assessments are triangulated. The conversations are between student- student, and between the teacher – student, as the teacher flows around the room. The teacher is conducting observations throughout the lesson. The product of this lesson will be the worksheet that students must submit the next class. This will be the main assessment as learning for the consolidated portion of the lesson. See the *“Teacher Guide” section* for example templates.

Differentiated Instructions

For this portion of the lesson, the teacher can provide prompting questions to help guide and scaffold the discussion. A visual chart can be provided and filled in by the teacher during the group discussion. If students are uncomfortable sharing in front of the class, the consolidation portion can be discussed within their “Mystery Organ” groups or in new smaller groups.

Extension

Teachers can create an assignment based on this activity. Students can pick a common disease (maybe from a list) that they can research and present. Students can focus on the relationship between the disease and different systems and vital organs. They can also discuss how social and environmental factors affect the disease or how these factors can influence the disease. Students can connect the medical technology to the cure or treatment of the disease. This could be completed in groups, with partners or individually. It can also be presented through a visual presentation, podcast presentation, brochures, or posters. Teachers can decide on the format based on the student’s interests and needs.

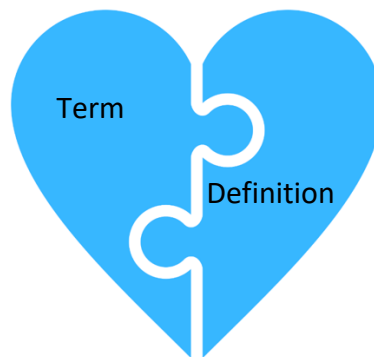
Teacher Guide

Terminology

The term will be written on one side of the puzzle piece and the definition will be written on the other.

- **Digestive system:** responsible for absorbing energy and nutrients from the food we eat.
- **Nervous system:** responsible for sending messages to and from the brain and the body. This is made up of 2 different systems (central and peripheral).
- **Muscular system:** responsible for moving our bodies and allowing us to live our day-to-day activities. This is made up of 3 different types (smooth, cardiac, and skeletal).
- **Circulatory system:** responsible for moving blood from the heart throughout the body through arteries and veins.
- **Skeletal system:** the framework of our bodies. It protects many organs and allows muscles to attach to them.
- **Respiratory system:** responsible for the exchange of oxygen and carbon dioxide within our bodies.
- **Vital organs:** organs that are essential for survival.
- **Heart:** a muscular organ that is essential in pumping blood throughout the body.
- **Brain:** an organ that is the “control center” of our bodies.
- **Kidney:** responsible for removing waste and water from our blood. There are 2 in our bodies and most people only need one to survive.
- **Liver:** an organ involved in many metabolic (digestive) processes.
- **Lungs:** an organ responsible for bringing in oxygen to the body and removing carbon dioxide from the body. We have 2 of them in our bodies.
- **Disease:** an illness that can cause damage and negative symptoms to our bodies.
- **Interconnected:** two or more things that relate to each other

Example of puzzle pieces:



Vital Organs (5)

Group 1 -> Yellow Card -> Vital Organ: Brain

Group 2- > Blue Card -> Vital Organ: Heart

Group 3- > Green Card -> Vital Organ: Kidney

Group 4- > Red Card -> Vital Organ: Liver

Group 5-> Orange Card -> Vital Organ: Lung

Stations (6) & Clues

Each station will have 6 cards that correspond with the colour and number of each vital organ. One side will have the number written on it and the other side will have the clue. They will be placed with the clue faced down on the table at each station.

Station 1: Circulatory System

- 1- Yellow Card: Without sufficient blood flow to me, the body is in immediate danger.
- 2- Blue Card: I have direct connections to both the arteries and veins. Through me, the blood is pumped.
- 3- Green Card: I help clean the blood to remove waste and extra water. I exist to help filter the blood.
- 4- Red Card: Blood full of nutrients come to me and I help break down carbohydrates, lipids (fat) and proteins. I exist to help digest food and remove bad toxins from the blood.
- 5- Orange Card: Without me, our bodies cannot have a reoxygenated blood supply.

Station 2: Respiratory System

- 1- Yellow Card: I control the muscles and organs that help the body bring in oxygen and remove carbon dioxide from the body.
- 2- Blue Card: I help pump oxygen-rich blood throughout the body.
- 3- Green Card: I may not be directly connected to the respiratory system, but I help remove waste products from the body.
- 4- Red Card: I help maintain a healthy balance of the systems, and homeostasis (healthy balance) of the body. If I do not do my job properly, I will cause more work for the organs and muscles directly involved in the respiratory system.
- 5- Orange Card: I am a key player in this system. I am the site where gas exchange occurs.

Station 3: Skeletal System

- 1- Yellow Card: I am kept safe within the skull.
- 2- Blue Card: I sit in between the lungs, and I am protected by the rib cage.
- 3- Green Card: The lower ribs hide me.
- 4- Red Card: I hide above the kidney, and I am protected by the middle ribs.
- 5- Orange Card: I sit on either side of the sternum and am fully covered by the rib cage.

Station 4: Muscular System

- 1- Yellow Card: Even though I am not a muscle, I do a lot of the "thinking" for the body and I control the muscles.
- 2- Blue Card: If I stop pumping, there will be no blood flow and energy sent to the muscles to operate.
- 3- Green Card: I am not directly related to the muscular system but the muscles around me protect me. Some muscles that protect me are the back muscles and abdominal muscles.
- 4- Red Card: I may not be directly related to the muscular system, but I also help with the metabolic process in the body like muscles.

- 5- Orange Card: I work with the diaphragm (a muscle) to help the body breathe.

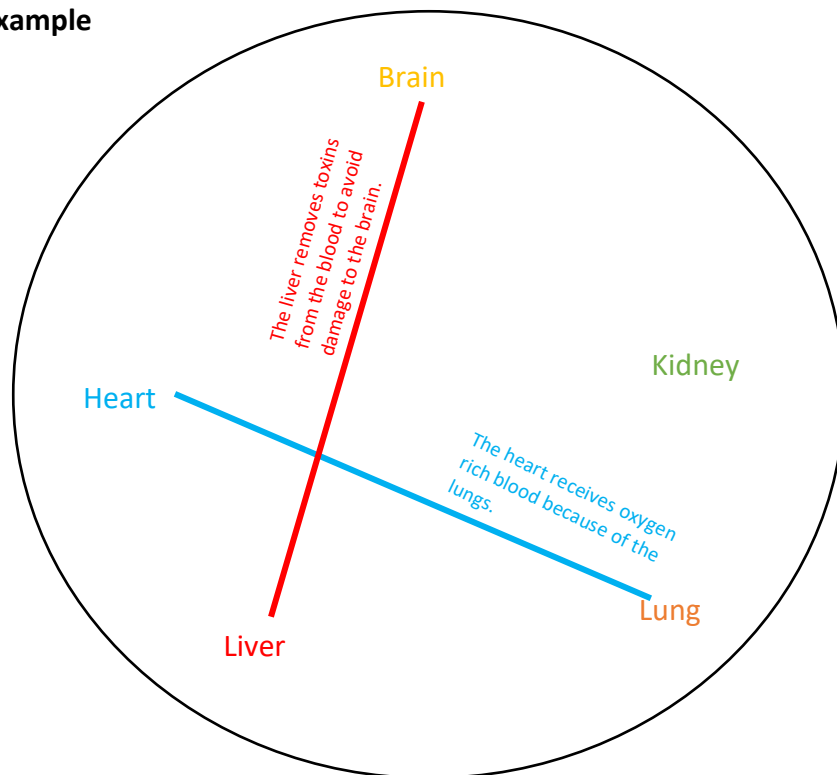
Station 5: Digestive System

- 1- Yellow Card: I tell the muscles involved in the digestive system how and when to work. This helps the body chew and swallow food.
- 2- Blue Card: I help provide digestive organs with oxygen and nutrients through the blood I pump.
- 3- Green Card: I help support the digestive system by removing waste from the blood. Although I am not directly related to the digestive system, if there is an issue with my function, then there is most likely an issue with the digestive system.
- 4- Red Card: I work to help the digestive system. I help absorb and store nutrients. I also release liquids (bile) to help with the digestive process.
- 5- Orange Card: I help bring oxygen into the body for the digestive organs to function properly.

Station 6: Nervous System

- 1- Yellow Card: I am the main organ in the nervous system.
- 2- Blue Card: The nervous system controls my rhythms and beats.
- 3- Green Card: I team up with the nervous system to make sure the body is in normal homeostasis (healthy balance within the body).
- 4- Red Card: The nervous system tells me how I should function and what I should release after eating or drinking something.
- 5- Orange Card: When my body is scared or nervous, I usually function faster than normal.

“Vital Organ Web” Example



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Possible Observation Checklists

Student Name:

Learning Goals	Working on the concept	Understands the concept	Deep understanding of the concept
Student understands the interrelationships between the human body systems and vital organs.			
Student understands the interrelationships between the different human body vital organs.			
Student can demonstrate how social and environmental factors can affect vital organs and the human body systems.			
Student can identify how technology can be beneficial to the human health.			
The student can work together to determine the unknown organ			
Notes:			

Possible Student Check-In

Learning Goals	Thumbs Up	Thumbs to the Side	Thumbs Down
I understand the interrelationships between the human body systems and vital organs.			
I understand the interrelationships between the different human body vital organs.			
I can demonstrate how social and environmental factors can affect vital organs and the human body systems.			
I can identify how technology can be beneficial to the human health.			
I can work with my group members to determine the unknown organ.			
Notes:			

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Mystery Organ

Name: _____ Group #: _____ Group Colour: _____

Station Chart

As you move through the stations, please complete the chart below. At each station, make a guess as to what you and your group believe is your "Mystery Organ" and provide a brief explanation on why you believe this.

System	Clue	Guess (Organ)	Reason For Your Guess

Discussion

Following our class discussion, answer the following questions.

What do you think your mystery organ is and why?

How does your mystery organ relate to the other vital organs?

What system does your mystery organ play a key role in?

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What happens if a disease affects your mystery organ? How does it affect its function within different human body systems?

What social and environmental factors can cause or add to the disease that affects your mystery organ? What technology can be used to help reduce the signs and symptoms of the disease?

What is something that you want to learn more about your mystery organ? What more do you want to know about your mystery organ?

Anticipated Answers

Student's answers may vary but these are some anticipated answers

Example: Heart attack

Questions	Anticipated Answers
What is the main vital organ that is affected by someone having a heart attack?	The main vital organ that is affected is the heart.
How would a heart attack affect my vital organs?	It will stop or limit blood flow to all the other vital organs, which will affect their functions.
What are some environmental or social factors that can cause a heart attack?	<ul style="list-style-type: none"> - Stress from life can cause a heart attack (social) - Poor eating habits that are high in trans-fat (social & environmental) - Air pollution can make it harder to breathe and the heart as to work extra hard (environmental)
Is there any technology that you know about that can reduce or help individuals who may have suffered a heart attack?	<ul style="list-style-type: none"> - By-passes - Stents - AED, sends currents through the heart to get it pumping back to regular rhythm (use when heart attack occurs)
How can this technology help to prevent heart attacks or ensure an early diagnosis?	Regular doctor check-ups through stress tests and imaging

Mystery Organ Questions- Example: Brain

Questions	Anticipated Answers
What do you think your mystery organ is and why?	I think my group's mystery organ is the brain because of all the clues. The main clue is that it is protected in the skull. The brain is the only vital organ in the skull.
How does your mystery organ relate to the other vital organs?	The brain relates to all the other organs because it controls the thinking of the body. It is related to the heart because the heart sends oxygen rich and nutrients to the brain through the circulation system (through the blood). This allows the brain to function properly.
What system does your mystery organ play a key role in?	The brain plays a key role in all the systems because without the brain the body doesn't know how to function. The main system the brain plays a role in is the nervous system.
What happens if a disease affects your mystery organ? How does it affect its function within different human body systems?	If a disease or illness affects the brain, the whole body and functions will be affected. This can cause slowed down progressing and movement to no processing and movement. This will be severely harmful for the body.

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<p>What social and environmental factors can cause or add to the disease that affects your mystery organ? What technology can be used to help reduce the signs and symptoms of the disease?</p>	<ul style="list-style-type: none">- Playing some sports (football, hockey, ect.) can cause damage to the brain. Technology such as helmets can prevent this. (social)- There are games that can be played to keep the brain “active”. This allows connections in the brain to be strong- There are tools that can help remind the brain where to make connections and remind the brain to stay “active”.
<p>What is something that you want to learn more about your mystery organ? What more do you want to know about your mystery organ?</p>	<ul style="list-style-type: none">- I want to learn more about what happens when there is an injury to the brain?- Can your body still function if there is an injury to the brain?