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ONTARIO **SCIENCE** CENTRE



Exhibit Inquiry

Body Works

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Grade 4-8



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Exhibit Inquiry

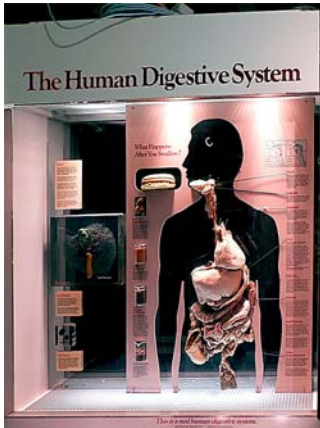
Body Works

Have students look for the following exhibits related to Body Works during their visit to the Ontario Science Centre:

Following Our Food

Where to go:

Human Body (Level 5)
The Human Digestive System



What it's about:

Examine a real human digestive system. Follow the path of food as it travels through the digestive system and learn how the digestive organs work together to help humans digest their food.

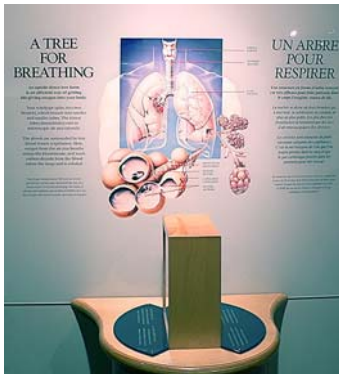
What to say and do:

- Track the digestive process from beginning to end. Name the parts of the digestive system and state some of their functions. (*Mouth – breaks down food into smaller parts and breaks down starch with saliva; liver – produces bile to break down fats; small intestine – further digests and absorbs nutrients.*)
- Look at the exhibit for information on fibre. Why is it important to have fibre in our diet? (*Eating fibre helps humans move waste through their body. Waste is easier to eliminate and it may help to prevent colon cancer.*)

A Tree for Breathing

Where to go:

Human Body (Level 5)
A Tree for Breathing



What it's about:

Investigate a path of air as it travels through the respiratory system.

What to say and do:

- Why does the respiratory system look like an upside-down tree? (*The trachea is like a trunk and the bronchus splits into progressively smaller branches.*)
- What is the most important gas in air that humans must inhale to survive? (*Oxygen*). Oxygen enters the human body through the respiratory system. What fluid carries oxygen throughout the body? This fluid is a part of what system? (*Blood; circulatory system*).
- The respiratory pathway ends at the alveoli (air sacs) in the lungs, and oxygen must be transferred to the blood. How does this happen? (*The walls of the alveoli are extremely thin and covered with tiny capillaries (blood vessels). The thin alveoli walls allow oxygen molecules to pass through from the oxygen-rich environment of the air sacs to the oxygen-poor environment of the capillaries.*)

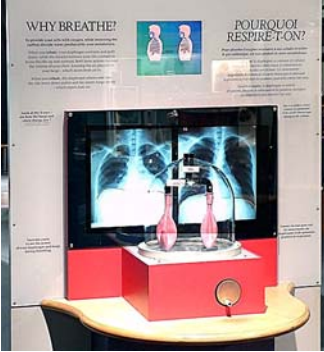
Exhibit Inquiry

Body Works

How Do We Breathe?

Where to go:

Human Body (Level 5)
Why Breathe?



What it's about:

Students investigate with this hands-on model of the human thoracic cavity to discover how humans breathe.

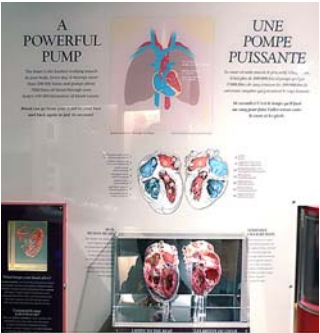
What to say and do:

- Every part of this model represents a part of the human respiratory system. Identify what each part represents. (*Glass jar – protective rib cage; central tube – trachea; branching tube – bronchus; balloons – lungs; moveable metal plate – diaphragm.*)
- The diaphragm is a muscle at the base of our thoracic cavity that helps us breathe. When the diaphragm contracts it lowers its position, and when it relaxes, it rises. Do we inhale or exhale when the diaphragm lowers? Turn the crank and examine the exhibit to discover the answer. (*We inhale when the diaphragm lowers, and exhale when the diaphragm rises.*)

A Closer Look at a Powerful Pump

Where to go:

Human Body (Level 5)
A Powerful Pump



What it's about:

The heart, the powerhouse of the circulatory system, is on display for students. This giant animal heart provides a great view of the muscles and chambers that make up the heart.

What to say and do:

- Before reading the exhibit panel, ask students to guess which animal this heart comes from. (*Elephant heart.*)
- Identify the four chambers of the heart. Compare muscle thickness between the left and right ventricles. Why do you think the left ventricle muscles are much thicker? (*Prompt students to think about the pathways blood travels after leaving the left and right ventricles. The left ventricle muscles are much thicker because they must pump blood through the whole body, whereas the right ventricle just pumps blood to the nearby lungs.*)

The Beating Heart

Where to go:

Human Body (Level 5)
Heartbeats / Listen to the Beat



What it's about:

Compare the heart rate of different animals. Listen to the differences between a healthy heart, a heart with a murmur and one that has recently suffered a heart attack.

What to say and do:

- Which usually beats faster – the heart of a large animal or a small animal? (*Small*) When would an animal's heart rate increase or decrease? (*Slows during hibernation; quickens during a flight or fight response.*) Check your predictions by examining the *Heartbeats* exhibit.
- What produces the sound of a heartbeat? (*The opening and closing of the heart valves.*) At *Listen to the Beat*, compare the different sounds of three hearts, only one of which is a normal, healthy heart. What could be causing the differences? (*Murmur – blood rushing through the valves between beats; heart attack – irregular beats due to recent stress on the muscle.*)

Resources

Body Works

Vocabulary

Alveolus	(pl. alveoli) One of millions of tiny air sacs in the lungs, which permit the exchange of gases.
Artery	Thick-walled, elastic vessel that carries blood away from the heart.
Atrium	(pl. atria) The upper cavity of the heart that receives blood from the veins and sends it to the ventricles through valves.
Bronchiole	Any of the minor divisions of the bronchi, which eventually lead to the alveoli.
Bronchus	(pl. bronchi) The major air passages of the lungs, usually referring to the two main divisions of the trachea.
Capillary	The smallest blood vessel in the body. Capillaries connect small arteries (arterioles) with small veins (venules). They enable the exchange of oxygen and other materials between blood cells and body tissue cells.
Diaphragm	The dome-shaped muscle separating the thorax from the abdomen, whose contraction during breathing leads to the expansion of the lungs.
Heart	A muscular organ maintaining the circulation of blood by rhythmic contraction and relaxation.
Intestine	Organ of the digestive system. There are two intestines: the small intestine, mainly responsible for nutrient digestion and absorption, and the large intestine, mainly responsible for water absorption and formation of feces.
Liver	An organ that helps to remove toxic substances and produces bile - a fluid that helps to break down fats.
Oxygen	A gas essential to human life which represents 21% of the total air composition.
Saliva	The watery mixture secreted by the salivary glands in the mouth. It lubricates chewed food, and contains enzymes for the digestion of carbohydrates.
Stomach	A sack-like organ that receives food from the esophagus. It secretes acids, enzymes and mucus to dissolve and partially digest food. It delivers its contents to the small intestine for further digestion and absorption.
Thorax	The chest cavity, located between the neck and the diaphragm. It contains and protects the chief organs of circulation and respiration.
Trachea	The windpipe. Reinforced by cartilage, the air passage that connects the larynx (voicebox) to the bronchi.
Valve	A membrane structure that opens or closes to control one-way flow of blood within the circulatory system (e.g., heart valves).
Vein	Vessel that returns blood to the heart.
Ventricle	The chambers in the lower portion of the heart that receive arterial blood from one of the atria, and contract to force it into the aorta or pulmonary artery.

Internet Links

Human Body for Kids
<http://www.sciencekids.co.nz/humanbody.html>

Books

The Human Body: A First Discovery Book, by Sylvaine Perols, Cartwheel Books, 1996.

PLEASE NOTE: Programs and exhibits are subject to change without notice.