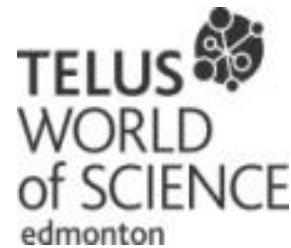


Health Gallery - Teacher's Guide

Division II - Health



This teacher's guide outlines ways which **The Body Fantastic** in the **Allard Family Gallery**. The Gallery and this guide may be used to present many of the concepts of the division II health program, to enhance classroom instruction, or as a culminating set of activities for classroom activities.

Be sure to inform TELUS World of Science Staff that you are using this teacher's guide and the accompanying Student Experience Guide. The Triaxial Trainer requires a trained interpreter for operation.

Health Program Elements addressed by the Health Gallery:

A. Grade 4

- Determine connections among physical activities, emotional and social wellness
- Examine the impact of environmental factors on personal health and develop environmental health habits (e.g., exposure to the sun, second-hand smoke, noise, extreme cold/heat)
- Analyze the need for variety and moderation in a balanced diet (e.g., role of proteins, carbohydrates, fats, minerals, water, vitamins).
- Examine and evaluate the health risks of smoking and various forms of tobacco.

B. Grade 5

- Examine the impact of physical activity, nutrition, rest and immunization on the immune system.
- Assess the importance of regular hygiene practices during adolescence; e.g., control of body odor, control of acne, maintenance of fresh breath
- Examine and evaluate the impact of caffeine, alcohol, drugs, on personal health/wellness

C. Grade 6

- Evaluate the need for balance and variety in daily activities that promote personal health; e.g., physical activity, relaxation, learning, sleep
- Examine how health habits/behaviours influence body image and feelings of self-worth
- Analyze personal eating behaviours – food and fluids – in a variety of settings; e.g., home, school, restaurants

Overview

This guide and the accompanying student discovery supports the spirit of the elementary health curriculum by providing exhibits that show the unique nature of the human body and some of the outside factors that affect its function. The student discovery guide has been written to highlight some of the body's unique

functions and to explore relationships that exist between body systems. It is recommended that you carefully read through the student guide to select those parts that will meet the educational goals that you have set for your field trip. The guide is organized into pre-trip, on-site and post-trip activities.

Pre-trip Activity – 1 – 2 hours

Creating an Analogy

The complexities of the systems that are essential for living things to survive are far more complex than anything humans have ever been able to create. In this lesson the teacher will prepare students for their visit to the health gallery by comparing the human body to an automobile. The complexity of the parts that make up a car and the interrelationships between those parts are an excellent starting point for having students analyze how our success as organisms is the result of the fuels that we put into our bodies coupled with the physical experiences to which we subject or our bodies are subjected.

Directions

1. Have students brainstorm and record on the blackboard or overhead the most complex systems/devices that they see in action each day.
2. Discuss the relative complexity of each of the devices.
3. A key element in this discussion is to introduce the concept of fuel (what it is and what it does). Students can easily relate to the concept of running out of gas or a battery running out of juice.
4. Lead a discussion about the automobile as one of the most complex devices used daily. Have students consider the systems are in the car.
 - Moving – the pistons, cam shaft and transmission
 - Preparing the fuel for consumption (the carburetor or fuel injection system)
 - Converting the fuel to a usable energy source (the cylinder)
 - Sending information from one part of the car to another (the electrical system including the battery and alternator)
 - Stopping- the brakes and tires
 - Eliminating wastes - valves, muffler and tail pipe
 - Turning – steering wheel
 - Cooling system – radiator
 - Night vision – headlights
 - Communication – gauges and warning lights
 - Fuel – gasoline, diesel, propane, natural gas
 - Lubrication – oil, grease
5. Discuss the relationship between the various systems in an automobile. Is there a need for the systems to work together (e.g., what if the engine and power train work but the brakes do not?)
6. Discuss with students the concept that cars wear out. Ask them: What causes automobiles to wear out? (e.g., poor service, poor fuel, unchanged oil, worn out tires, general use, rust, etc.)

7. Once students have a clear picture of the parts of a car and the things that can go wrong with it, introduce the idea that our bodies, though much more complex can be compared to a car.
8. Introduce the basic body systems that students will encounter when visiting the TELUS World of Science: senses, skeletal-muscular, digestive, cardiovascular, respiratory and excretory.
9. Lead a discussion that considers the following:
 - The function of each of each of the systems compared to those of a car.
 - The relationships between the function of the system and the organs that provide the function.
 - The interrelationships of each of the systems.
 - Factors that affect the ability of the system to work effectively.
10. Explain to students that they will be visiting the Odysium and while there you want them to focus on the systems that exist and the response of our bodies to things we do to our bodies. Have students specifically look for differences and similarities based on things like gender, age, etc.

The Field Trip

Expected behaviours

TELUS World of Science Edmonton is a public facility it is a requirement of supervisors to ensure that all students behave in a manner appropriate with and conducive to an enjoyable experience for themselves and others. As such school or better behaviours are expected.

Arrival

You will be greeted at the front door by volunteer staff. The organizing teacher is requested to go to the cashiers to complete the registration process. Coat racks (unsecured) are supplied if required.

The Gallery Experience

When students enter the gallery they will be visually and auditorially captivated. The accompanying map lays out the location of the systems and within the system arrows point to the specific location where students are to use the gallery interactives and the gallery discovery guides to develop further knowledge and understandings.

Remind students that they are to complete a given number of activities (**to be determined by the classroom teacher**) and that while doing so they are to continue to consider how the system works to keep us alive; how the various parts of the system work to support the whole and the affect that outside events and agents have on the success of the system.

Heart and Circulatory System – Background Information

The heart responds to a variety outside stimuli including: disease, heredity, fear, anger, heavy workload, sleep, smoking, ingestion of different foods or drugs and air quality. The response of the heart and circulatory system range from a change in heart rate and pressure, to irregularities in heart rate and the quality of the function of both the resilience of the heart muscle and the seal created by heart valves.

Disease - rheumatic fever and some streptococcal infection attack the valves making them incapable of preventing backflow of blood into the heart leading to congestive heart failure.

Heredity – heredity plays a significant role in the cardiovascular health. In some people there is a resistance to the build up of cholesterol in the arteries. In others, cholesterol builds up at rates far exceeding what one would expect from the quantity of high fat foods ingested. Other people inherit weak heart valves or hearts with holes between chambers.

Blood Pressure- blood pressure plays a significant role in long-term health. Consistently high blood pressure increases the risk of stroke and can lead to congestive heart failure (a condition caused when increase blood pressure weakens the heart muscle until it loses a great deal of its elasticity and ability to spring back when it pumps. Healthy blood pressure remains in the area of 120 mg/Hg systolic and 80 mg/Hg diastolic.

Fear and Anger – Both tend to cause a short-term rise in both blood pressure and heart rate. These responses are the result of the body attempting to meet the perceived needs for increased blood flow to the skeletal muscles.

Smoking – the most significant impact that smoking has on the heart is that it reduces the amount of oxygen that the lungs are able to absorb during breathing. As a result the heart must work harder without providing a training effect.

Alcohol and Drugs – alcohol and drugs can affect the heart in number of ways including raising or lowering the heart rate and blood pressure and creating heartbeat irregularities.

Heavy Workload – Studies have shown that a heart that is worked within the middle to high end of its aerobic capacity becomes stronger and more able to use oxygen that is supplied to it through the coronary arteries. In addition, a body that is worked aerobically tends to be less fat, less cholesterol is found to be deposited in arteries and blood pressure tend to be lowered.

Digestive System – Background Information

The digestive system is composed of the mouth with its teeth, tongue and saliva. From the mouth food passes through the esophagus to the stomach by being squeezed downward by a process called peristalsis. Peristalsis is generally a one-way process (though ingestion of materials and illnesses trigger nausea and reverse peristalsis on occasion). We are actually fortunate that we can eliminate some harmful substances in this manner as it prevents them from making their way through the digestive system causing more damage. Rat and mice cannot

eliminate material in his manner. In the stomach acids and other substances work on the food and break it down into large molecules some of which are absorbed by the stomach wall into the blood stream. From the stomach the liquid mixture passes through a valve into the small intestine. The stomach, small intestine and large intestine are all lined with tiny finger-like projections called villi. These villi are responsible for increasing the surface area of the digestive making them better able to absorb nutrients. The majority of the nutrients are absorbed through the 6-7 metres of small intestine. From the small intestine where most of the nutrients have been removed the food passes into the large intestine where a good deal of water is removed and enters the blood stream. From large intestine food is eliminated through the anus.

The Gallery

Several displays around the back of the gallery have been designed to point out the various functions of the digestive system.