

Expedition Overview

Expedition Title: Body Systems	Timeframe : Till end of August
Grade level: 7	Authors: Grade 7 Team
Date created or revised: March 2013	

Expedition Summary

In this Learning Expedition, students will do a scientific study of four Human Body Systems- Digestive, Respiratory, Circulatory and Excretory. They will use models, computer simulations, analogies and experimental set ups to understand the structure and functioning of various organs. They will study how each body system works in synchronization with the others, the output of one system becoming the input for another.

During the course of the expedition, they will design and create an innovative kit that can be used by teachers to help young students understand how the organs of the four body systems work. As part of their service, they will present this product to the teachers of a municipal school of the city.

Big Idea

The Human Body is an amazing machine made up of many small systems, each system being the outcome of individual parts and their interrelationship.

Guiding Questions

What is a system and how does it work?
How do food, water and air keep me alive?

Learning Targets	
Conceptual	<p><u>Project 1: The Human Digestive System</u></p> <ul style="list-style-type: none"> • I can explain the structure of the human digestive system, with the help of a neat and a well labeled diagram. • I can explain the process of digestion, the role of the different organs, and that of digestive enzymes. <p><u>Project 2: The Human Respiratory and Circulatory Systems</u></p> <ul style="list-style-type: none"> • I can explain the structure of the Human Respiratory System, with the help of a labeled diagram. • I can explain the basic structure and the functions of the human heart, the 3 kinds of blood vessels and the composition of blood. <p><u>Project 3: The Human Excretory System</u></p> <ul style="list-style-type: none"> • I can briefly explain how Nitrogenous Wastes are produced in the Human Body. • I can briefly explain the structure and functioning of the Human Urinary System, with the help of a labeled diagram.
Process Skill	<p>Observation and Recording I can make minute observations. I can record observations in the format provided to me.</p> <p>Reading I can use Comprehension Strategies to understand a text.</p>
Craftsmanship Skill	<p>Systems Thinking I can identify various elements within a System. I can explain how the elements of a System interact to produce its behavior.</p>
Product Skill	<p>Writing I can write instructions in the form of clear, crisp sentences arranged in the right sequence.</p> <p>Planning I can break down the task given into action steps, based on my understanding of what exactly is the end product/performance. I can write my plan in the form of detailed action steps. I can realistically estimate the time needed for each step. I can assigns roles and responsibilities within the crew, taking into account that</p>

	work is distributed fairly.
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Project 1	
Project Title and the key steps Digestive System	Guiding Question
Eliciting scientific information from relevant texts (Disgusting Digestion, Horrible Science Series/ The Incredible Journey of Harriet Hamburger) Experiment: Action of Saliva on Starch Measuring the length of different parts of the gut Sock and Paperweight model for Peristalsis How do the villi work? Using Paper Model. Work on the End Product Writing The Great Glucose Journey Part 1 Systems Thinking Game 1	What happens to food inside my body?
Case Study	Final product/ performance and the Audience
Stomach with a Hole	An Innovative Teaching Learning Kit on Digestive System. (At the end of the expedition) Demonstration of the use of the kit in the classroom and handing over of the kit to teachers of a Municipal school in the city.

Project 2	
Project Title and the Key Steps Respiration Making a working model of Respiratory System (Crew wise viewing of Respiratory System Apps on I pad) Lime Water Test, Mirror test Measuring Lung Capacity Writing: The Great Glucose Journey PART 2	Guiding Question How is Energy produced in my body?

<p>Circulation Heart: Study material, teacher guided drawing of the flow of blood through the heart Kinesthetic Activity: Heart Structure and Flow of Blood (Balloons/ Wrist bands) Crew wise viewing of Circulatory System Apps on I pad Writing The Great Glucose Journey PART 3 Work on the End Product</p> <p>Systems Thinking Game 2</p>	
Case Study	Final product/ performance and the Audience
<p>Joe's Body- Lungs, Heart (Reader's Workshop on determining importance)</p>	<p>An Innovative Teaching Learning Kit on Respiratory and Circulatory Systems. (At the end of the expedition) Demonstration of the use of the kit in the classroom and handing over of the kit to teachers of a Municipal school in the city.</p>

Project 3	
<p>Project Title and the key steps The Human Urinary System - Model to simulate action of Kidneys</p>	<p>Big Ideas/ Broader Concepts How are wastes removed from my body?</p>
Case Study	Final product/ performance and the Audience
<p>Joe's Body—Kidneys Systems Thinking Game 3</p>	<p>An Innovative Teaching Learning Kit on Urinary System. (At the end of the expedition) Demonstration of the use of the kit in the</p>

classroom and handing over of the kit to teachers of a Municipal school in the city.

Hook

Each crew is given 2 Task cards with the following task:

You and your partner need to do this for each other.

1. Note down each other's **breathing rate** while at rest, after walking for 1 minute, after spot jumping for 1 minute and running for 1 minute. You can put a finger beneath the nose of your partner and record the number of time your partner exhale.
2. Note down each other's **pulse rate** while at rest, after walking for 1 minute, after spot jumping for 1 minute and running for 1 minute. You can put a finger across your partner's wrist and record the number of pulse felt.
3. Note down each other's **heart beat** while at rest, after walking for 1 minute, after spot jumping for 1 minute and running for 1 minute. You can check the heart beat with the help of stethoscope.

Students note their observations in the form of a table and represent the data as Bar Graphs.

Students note down any patterns that they can see, and their wonder questions.

Hunt

Introduction to Systems Thinking through a Balinese folktale – **The Gecko's Complaint.**

Students use a visual tool, **Connection Circles**, to identify elements in the story which change with time and inter-dependence of one element on another. Students use a Connection Circle to visually represent the change in the response of the human body to changing activity.

Each crew plays the mystery card game (**Unbelievable Facts** of the human body)

A short video on the Human Body as a System.

Each crew works on the Human Body Puzzle (Putting together the organs of

	the Human Body) while parallelly studying the difference between ‘Heaps’ and ‘Systems’.
Expedition Launch	<ul style="list-style-type: none"> • Sharing of Overview of the Expedition with Students • Sharing of Product Descriptor • Sharing of Time line
Experts	Physicians
Service Learning	Organizing a workshop for teachers of a Municipal school in the city to demonstrate the use of the kit in the classroom, and handing over the kit to them.