Grade 7 Science – Course 2
Unit # 1- Life Science
Topic 2 Human Body Systems – 20 Days

Unit Overview Students will understand and apply scientific concepts, principles, and theories pertaining to the living environment setting and recognize the historical development/multicultural involvement of the ideas in science. Main ideas include: living things are alike yet different, structures in living things are related to their function and living things interact with their environment. Students consider systems and how they interact as they investigate cell function and cellular processes as well as exploring the human body as a system model, driven by the flow of energy and the cycling of matter. This leads to the study of reproduction and the plant and animal structures that support it. Students consider stability and change as a core concept in the biosphere.

Topic Essential Question: How do systems interact in the human body?

Lessons

- Topic Launch/Quest Kickoff
- Lesson 1 Body Organization
- Lesson 2 Systems Interacting
- Lesson 3 Supplying Energy
- Lesson 4 Managing Materials
- Lesson 5 Controlling Processes
- Topic Close –Assessment, Quest Findings

NYSSLS Performance Expectations

MS-LS1-3. Construct an explanation supported by evidence for how the body is composed of interacting systems consisting of cells, tissues, and organs working together to maintain homeostasis. [Clarification Statement: Emphasis should be on the function and interactions of the major body systems (e.g. circulatory, respiratory, nervous, musculoskeletal).] [Assessment Boundary: Assessment is focused on the interactions between systems not on the functions of individual systems.]

MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli, resulting in immediate behavior and/or storage as memories. [Assessment Boundary: Assessment does not include mechanisms for the transmission of this information.]

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Topic Opener	**Savvas**
PE: MS-LS1-3; MS-LS1-8 **SEP:** Obtaining, Evaluating, and Communicating Information **DCI:** **LS1.A -** Structure and Function ● In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3) **CCC:** Systems and System Models	**Highlighted labs are important to the understanding of the instructional concepts in this lesson and must be completed during Science instructional time.** ● Topic Readiness Test ● *u*Connect Lab – How is your body organized? ● Quest Kickoff Video – How do your body systems interact when you train for your favorite sport?
Lesson 1 – Body Organization	**Savvas**

PE: MS-LS1-3
SEP: Engaging in Argument from Evidence
DCI:
LS1.A - Structure and Function
- In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3)

CCC: Systems and System Models

zSpace Activities (code)
Skeletal System (A273)
Skeletal System - Teacher Activity Plan
Students will learn why their internal skeletons are important, and will analyze how the skeletal system supports, moves, and protects the body.
Skeletal System - Student Worksheet
Skeletal System - Student Worksheet GoogleDoc

Muscle Mechanics (A114)
Muscle Mecanics - Teacher Activity Plan
In this activity, students will identify different types of muscle tissue, learn how muscles work, and identify important muscle pairs in the human arm and leg.
Muscle Mechanics - Student Worksheet 1 &
Muscle Mechanics - Student Worksheet 2
Muscle Mechanics - Student Worksheet GoogleDoc

Structure of Bones (A272)
Structure of Bones - Teacher Activity Plan
In this activity, students will focus in on the structure and inner workings of our bones.
Structure of Bones - Student Worksheet
Structure of Bones - Student Worksheet GoogleDoc

Guiding Objectives:
- Students will use textual evidence to: List the levels of organization in the body; describe the organization of body systems; describe the functions of cells, tissues, organs, and body systems.
- Students will use evidence to construct and support arguments in order to: Compare the structure and function of body systems to other systems (e.g. car, invertebrates); explain the general functions of body systems, including how they work together to function.

Literacy Connection
- Support Authors Claim

Vocabulary
- tissue
- organ
- organ system

Academic Vocabulary
- organized

Connect - TE/SB p. 72
- Connect It!
- Quest Connection
- Inquiry Warm-Up Lab; System-atically Organized

Investigate - TE/SB pp. 73-79
- *u*Investigate Lab – Observing Cells and Tissues
- Video – Body Organization
- Interactivity – Human Body Systems
- Interactivity – Balancing Act
- Reading Checks (pp.73; 75; 77; 79)
- Math Toolbox (p.74)
- Literacy Connection (p.77)

Synthesize - TE/SB pp. 79
- Interactivity – Interacting Systems

Demonstrate – TE/SB pp.80
- Lesson 1 Check
- Lesson Quiz 1

Lesson 2 – Systems Interacting

PE: MS-LS1-3
SEP: Engaging in Argument from Evidence
DCI:
LS1.A - Structure and Function

- In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3)

CCC: Systems and System Models

zSpace Activities (code)
Levels of Organization (A306)
Levels of Organization - Teacher Activity Plan
In this activity, students will investigate what makes up a cell and how these building blocks of life are organized within and among living things on Earth. Biological levels of organization will be explored from the atom to the biosphere.
Levels of Organization - Student Worksheet
Levels of Organization - Student Worksheet GoogleDoc

Skeletal System (A273)
Skeletal System - Teacher Activity Plan
Students will learn why their internal skeletons are important, and will analyze how the skeletal system supports, moves, and protects the body.
Skeletal System - Student Worksheet
Skeletal System - Student Worksheet GoogleDoc

Muscle Mechanics (A114)
Muscle Mecanics - Teacher Activity Plan
In this activity, students will identify different types of muscle tissue, learn how muscles work, and identify important muscle pairs in the human arm and leg.
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Muscle Mechanics - Student Worksheet 2
Muscle Mechanics - Student Worksheet GoogleDoc

Structure of Bones (A272)
Structure of Bones - Teacher Activity Plan
In this activity, students will focus in on the structure and inner workings of our bones.
Structure of Bones - Student Worksheet
Structure of Bones - Student Worksheet GoogleDoc

Savvas
Guiding Objectives:

- Students will identify evidence to describe and explain: Stimulus-response situations; how the glands of the endocrine system control body processes; how the nervous system compares to the endocrine system; how systems interact to maintain homeostasis.
- Students will identify evidence to predict and describe: What may happen if one body system stops interacting with another; how blocked blood vessels affect cells; how healthy choices affect organ systems.

Literacy Connection

- Cite Textual Evidence

Vocabulary

- stimulus
- response
- gland
- hormone

Academic Vocabulary

- interactions
- stable

Connect - TE/SB p. 82

- Connect It!
- Quest Connection
- Poll: Growth Spurt

Investigate - TE/SB pp. 83-90

- Video – Systems Interacting
- *uI*nvestigate Lab – Parts Working Together*
- Interactivity – Communication and Homeostasis
- Interactivity – Joints
- Virtual Lab – Physiology and Fitness
- Literacy Connection
- Plan It! (p.85)
- Reading Check (pp.84; 86; 89; 90)

Synthesize - TE/SB pp. 90-91

- Interactivity – A Variety of Symptoms
- Quest Check-In Interactivity – Training Systems
- Quest Check-In

Demonstrate – TE/SB p. 91

- Lesson 2 Check
- Lesson 2 Quiz

*Denotes accompanying lab video

Lesson 3 – Supplying Energy **PE:** MS-LS1-3 **SEP:** Engaging in Argument from Evidence **DCI:** **LS1.A -** Structure and Function ● In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3) **CCC:** Systems and System Models **ZSpace Activities (code)** **Digestive System (A308)** Digestive System - Teacher Activity Plan In this activity students will explore the human body's digestive system to gain an understanding of its structure and functions. Digestive System - Student Worksheet Digestive System - Student Worksheet GoogleDoc	**Savvas** **Guiding Objectives:** ● Students will identify and explain: The important nutrients a body needs to carry out its processes; how the body's systems process the foods you eat. ● Students will develop arguments to explain: Why some food choices are healthier than others; how food becomes materials the body can use. ● Students will analyze proportional relationships to determine the total recommended daily allowances of nutrients **Literacy Connection** ● Write Arguments **Vocabulary** ● digestion ● nutrients ● carbohydrates ● peristalsis ● saliva **Academic Vocabulary** ● absorption ● elimination **Connect -** TE/SB p. 94 ● Connect It! ● Quest Connection ● Poll - Energized **Investigate -** TE/SB pp. 95-102 ● *u*Investigate Lab – Measuring Calories ● Nearpod for *u*Investigate Lab – Measuring Calories available in BPS K-12 Science Schoology Group ● Video – Supplying Energy ● Interactivity – Bits and Pieces ● Interactivity: Investigating Cells and Homeostasis ● Model It! ● Reading Check (pp 97; 99) ● Math Toolbox (p.98) ● Plan It! (p.97) ● Literacy Connection (p.95) **Synthesize -** TE/SB pp. 103-104 ● Interactivity – A Day in the Life of a Cell ● Quest Check-In Interactivity – Training Table ● Quest Check-In ● Reading Check (p.103) **Demonstrate –** TE/SB p.104 ● Lesson 3 Check ● Lesson 3 Quiz
Lesson 4 – Managing Materials	**Savvas**

PE: MS-LS1-3
SEP: Engaging in Argument from Evidence
DCI:
LS1.A - Structure and Function
- In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3)

CCC: Systems and System Models

zSpace Activities (code)
Circulatory and Respiratory System (A010)
Circulatory and Respiratory System - Teacher Activity Plan
Students will take a tour of the circulatory and respiratory systems of the human body. They will explore how these two systems are related, the parts included in each, and how those parts are similar to other parts of the human body.
Circulatory and Respiratory System - Student Wkst 1,
Circulatory and Respiratory System - Student Wkst 2,
Circulatory and Respiratory System - Student Wkst 3
Circulatory and Respiratory System - Student Worksheets GoogleDocs

What is your Blood Type (A070)
What is your Blood Type - Teacher Activity Plan
In this activity, students will learn about blood types and that in sexual reproduction, each parent contributes half of the genetic information that determines the offspring's blood type.
What is your Blood Type - Student Worksheet
What is your Blood Type - Student Worksheet GoogleDoc

Guiding Objectives:
- Students will use textual evidence to explain how body systems interact to transport materials throughout the body.
- Students will analyze diagrams in order to explain how the respiratory system interacts with other systems to exchange gases.
- Students will interpret photos and text to explain how other body systems interact with the excretory system to remove waste.

Literacy Connection
- Draw Evidence

Vocabulary
- circulatory system
- artery
- capillary
- vein
- lymph
- bronchi
- alveoli

Academic Vocabulary
- contract

Connect - TE/SB p. 106
- Connect It!
- Quest Connection
- Inquiry Warm-Up Lab: Your Heart, Your Breathing

Investigate - TE/SB pp. 107-115
- *u*Investigate Lab – Body Systems Working Together
- Video – Managing Materials
- Interactivity – Body Highways and Byways
- Interactivity – Testing a Training Plan
- Interactivity – Circulatory System
- Reading Check (pp. 110; 111; 113; 115)
- Math Toolbox (p.110)
- Literacy Connection (p.111)

Synthesize - TE/SB p. 115-117
- Quest Check-In Lab – Heart Beat, Health Beat
- Quest Check-In
- Model It! (p.116)

Demonstrate – TE/SB p.117
- Lesson 4 Check
- Lesson 4 Quiz

<u>Lesson 5 – Controlling Processes</u>
PE: MS-LS1-8

Savvas
Guiding Objectives:

SEP: Developing and Using Models; Engaging in Argument from Evidence; Obtaining, Evaluating, and Communicating Information
DCI:
LS1.D: Information Processing
- Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. (MS-LS1-8)

CCC: Cause and Effect; Systems and System Models

zSpace Activities (code)
Nervous System (A033)
Nervous System - Teacher Activity Plan
Students will dissect the nervous system and a virtual brain. They will explore the nervous system, nerves, connections, and the ways in which the brain communicates with the body.
Nervous System - Student Worksheet
Nervous System - Student Worksheet GoogleDoc

- Students will use evidence to explain what systems control processes in the human body.
- Students will use visuals to explain how nerve signals travel.
- Students will develop and use models to demonstrate how the body senses and reacts to surroundings.

Literacy Connection
- Integrate with Visuals

Vocabulary
- neuron
- synapse
- brain
- spinal cord
- gland
- negative

Academic Vocabulary
- impulse

Connect - TE/SB p. 118
- Connect It!
- Quest Connection
- Inquiry Warm-Up Lab – How Does Your Knee React?

Investigate - TE/SB pp. 119-125
- *u*Investigate Lab – What are the Parts of the Nervous System?*
- Video – Controlling Processes
- Interactivity – Humans vs. Computers
- Model It! (p.123)
- Reading Check (pp. 120; 123)
- Literacy Connection (p.42)

Synthesize - TE/SB pp. 126-127
- Interactivity – Flex Your Reflex
- Literacy Connection (p.126)
- Reading Check (p.126)
- Quest Check-In Interactivity – Why Practice Makes Perfect
- Quest Check-In

Demonstrate – TE/SB p.127
- Lesson 5 Check
- Lesson 5 Quiz

*Denotes accompanying lab video

Topic Close

Topic 2 Enrichment
Topic 2- Lesson 1 Enrichment

• Topic 2 Assessment and Remediation TE/SB pp. 128-131 • Quest Finding and Reflection TE/SB p. 131	• Enrichment – Blood is a Tissue • Interactivity – Advances in Medical Technology • Design Challenge – Using Phenomena – Engineering and Organ **Topic 2 - Lesson 2 Enrichment** • Enrichment Activity – Interaction Among Systems • Case Study – Agents of Infection (pp.92-93) • Career Video - Illustrator **Topic 2 - Lesson 3 Enrichment** • Enrichment Activity – A Balanced Diet • Careers – Nutritionist (p.105) **Topic 2 - Lesson 4 Enrichment** • Enrichment Activity – A Closer Look at Blood Vessels **Topic 2 Lesson 5 Enrichment** • Enrichment – Polygraph Test

English Language Learners (ELL) Enhancements To access hyperlinked material, you must be logged into your BPS Google Drive	**Listening** • **Cross- Linguistic Practices:** Gives students opportunities to make connections between what they hear and their home language (For example, allow students to listen to a passage and identify cognates). • **Activating Prior Knowledge** Activating prior knowledge means both eliciting from students what they already know and building initial knowledge that they need in order to access upcoming content. • **Visuals** - GIFs, pictures- will assist students in understanding what they are listening to. Use **visual thinking strategies** to set the lens for learning. • Video to review or introduce a topic – use **closed captioning** to help students see the words and pronunciations while they listen to the content. • **Word stretching / Vowel stretching** when instructing allows students to listen closely to the pronunciation of the word. • **Performance Level Descriptors** this document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of listening. Scroll for grade 7.
	Speaking • **Sentence Stems/Frames** - to begin a sentence - such as *Evolution is…* or *I think that evolution is…* • **Academic Conversation Starters:** Have a visual of a list of academic sentence starters that students can refer to in a discussion. • **Choral Reading** - To build fluency, self-confidence and motivation with reading/speaking. • Create **movement** to go with the word. Movement can be a motivating factor, as well as a kinesthetic tool for conceptualizing the rhythm and flow of fluent reading while triggering brain function for optimal learning. • **Performance Level Descriptors** This document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of speaking. Scroll for grade 7.
	Reading • Supplementary Text to help reinforce concepts.

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Visual Aids - Pictures or models to support vocabulary words and concepts
Video to review or introduce a topic - use closed captioning to help students read along while they listen to the content.
4 Square / Frayer models to help students gain a deeper understanding of vocabulary.
Highlighting important text to assist students in answering questions after the reading.
Chunking-Break reading of text into chunks or paragraphs
Vocabulary Morphology- Morphology relates to the segmenting of words into affixes (prefixes and suffixes) and roots or base words, and the origins of words. Understanding that words connected by meaning can be connected by spelling can be critical to expanding a student's vocabulary.
Performance Level Descriptors this document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of reading. Scroll for grade 7.

Instructional Accommodations (depending on the student's needs)

Extended time for tests in class, projects and assignments
Directions read. Broken down as necessary
Model how to complete the activity in the lesson
Oral simplification of directions or questions
Translated version of test when available. Student may have both version English and native language version
Use of approved bilingual glossaries from NYS in each subject

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<tr><td rowspan="3">Special Education Modifications

Special Education students must have accommodations as per Individual Educational Plan (IEP)</td><td>
Instructional

Pre-teach vocabulary
Use picture vocabulary
Scaffold Depth of Knowledge questions
Provide copy of notes/notes in "cloze" form
Use of Think, Pair, and Share strategy to help process information
Scaffold written assignments with the use of graphic organizers
Allow for multiple ways to respond (verbal, written, response board)
Provide model of performance task
Modify informational text to fit the needs of the students
Provide a digital or paper interactive notebook
Present complex tasks in multiple ways
Provide mnemonic strategies for scientific concepts

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Technology:

Audio reading of text
Text to type functions
Videos to clarify/visualize science concepts
Record class lecture/discussions and make accessible to student
Nearpod- interactive presentations of notes

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In Class Assessments

Provide multiple options for projects
Use of timer in class
Break all complex tasks into chunks

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<tr><td>Step Up to Writing</td><td>

Easy Two-Column Notes
Breaking Down Definitions
Paragraph Frame- What I Learned

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Step Up to Writing Materials can be found in BPS Science K-12 Schoology Folder Grade 5 Resources Grade 5 SUTW materials	• **Performance Level Descriptors** this document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of writing. Scroll for grade 7.
Culturally and Linguistically Responsive Teaching (CLRT) in the Science Classroom	• Materials, resources, and/or discussions address diverse cultural backgrounds and real-world applications • Artifacts (posters, charts, etc.) in the science classroom are representative of the cultures of the student population • All students are given an opportunity to engage in science discourse • Teacher demonstrates high expectations for all students