



**Grade 6 Science**  
**Unit # 2 – Earth and Space Science**  
**Topic 10 Earth’s Surface Systems – 20 Days**

**Unit Overview:** Students will explore living things This includes how and why organisms are classified. Students will also learn about viruses, bacteria, protists, fungi, plants, and animals. Students will gain an understanding of how organisms from these various groups impact humans.

**Topic Essential Question:** How do scientists define and organize living things?

**Lessons**

- Topic Launch/Quest Kickoff
- Lesson 1 Living Things
- Lesson 2 Classification Systems
- Lesson 3 Viruses, Bacteria, Protists, and Fungi
- Lesson 4 Plants and Animals
- Topic Close –Assessment, Quest Findings

**NYSSLS Performance Expectations**

**MS-LS1-1. Plan and conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. [Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells.]**

**MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. [Clarification Statement: Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.] [Assessment Boundary: Assessment of organelle structure/function relationships is limited to the cell wall and cell membrane. Assessment of the function of the other organelles is limited to their relationship to the whole cell. Assessment does not include the biochemical details related to the functions of cells or cell parts.]**

**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-LS4-2. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. [Clarification statement: Emphasis is on explanations of the evolutionary relationships among organisms in terms of similarity or differences of the gross appearance of anatomical structures as evidence of common ancestry.]**

**Topic Opener**

PE: MS-LS-4-2

SEP: Engaging in Argument from Evidence

DCI:

LS4.A: Evidence of Common Ancestry and Diversity

- Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent. (MS-LS4- 2)

CCC: Structure and Function

**Savvas**

**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
- **uConnect Lab – Is It an Animal?**
- Quest Kickoff Video
- Quest Kickoff – How can you design a field guide to organize living things?

## **Lesson 1 – Living Things**

**PE:** MS-LS1-1

**SEP:** Planning and Carrying Out Investigations

**DCI:**

**LS1.A:** Structure and Function

- All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1)

**CCC:** Scale, Proportion, and Quantity

### **zSpace Activities (code)**

#### **Plant Cell vs. Animal Cell (A187)**

[Plant Cell vs. Animal Cell - Teacher Activity Plan](#)

In this activity, students will compare the structures of an animal cell with those of a plant cell.

[Plant Cell vs. Animal Cell - Student Worksheet](#)

[Plant Cell vs. Animal Cell - Student Worksheet GoogleDocs](#)

#### **Binary Fission (A561)**

[Binary Fission - Teacher Activity Plan](#)

All living organisms, including cells, reproduce to pass their characteristics or genes onto their offspring through asexual or sexual reproduction.

[Binary Fission - Student Worksheet](#)

[Binary Fission - Student Worksheet GoogleDoc](#)

#### **Cell Showcase (A248)**

[Cell Showcase - Teacher Activity Plan](#)

Though we don't have time to look at all 200 types of cells in the body, this activity showcases 8 examples. The models included in this activity will give future scientists, doctors, and biotech engineers a memorable view into the amazing world of cell differentiation.

[Cell Showcase - Student Worksheet](#)

[Cell Showcase - Student Worksheet GoogleDocs](#)

#### **Junk Cell (A020)**

[Junk Cell - Teacher Activity Plan](#)

To create their "junk cell," students can use any models or any parts of a model available that represent the functions of cell organelles. Examples of models include an airplane, an Xbox controller, a car door, and a cheeseburger.

[Junk Cell - Student Worksheet](#)

[Junk Cell - Student Worksheet GoogleDocs](#)

## **Savvas**

### **Guiding Objectives:**

- Students will conduct an investigation to provide evidence that supports living things are made of cells.
- Students will identify evidence that explains where living things come from.
- Students will conduct an investigation to provide evidence that explains what living things need to stay alive, grow, and reproduce.

### **Literacy Connection**

- Gather Information

### **Vocabulary**

- organism
- cell
- unicellular
- multicellular
- stimulus
- response
- spontaneous generation
- homeostasis

### **Academic Vocabulary**

- characteristics

### **Connect - TE/SB p. 438**

- Connect It!
- Inquiry Warm-Up Lab: All Wound Up
- Quest Connection

### **Investigate - TE/SB pp. 439-445**

- *u*Investigate Lab – Cheek Cells
- Video – Living Things
- Interactivity – What All Living Things Have in Common
- Literacy Connection (p.444)
- Reading Checks (p. 443; 445)
- Plan It! (p.445)

### **Synthesize - TE/SB pp. 446-447**

- Interactivity – Mom's Car Must be Alive
- Quest Check-In Interactivity – Under the Microscope
- Quest Check -In
- Reading Check (p.446)

### **Demonstrate – TE/SB p.447**

- Lesson 1 Check
- Lesson Quiz 1

**Lesson 2 – Classification Systems**

**PE:** MS-LS4-2

**SEP:** Constructing Explanations and Designing Solutions;

**DCI:**

**LS1.A:** Structure and Function

- All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1)

**CCC:** Patterns

**Savvas**

**Guiding Objectives:**

- Students will identify and describe evidence that explains how living things are classified into groups; examines the organization of levels of classification.
- Students will identify and describe evidence that explains how the theory of evolution supports the classification of organisms.

**Literacy Connection**

- Asses Sources

**Vocabulary**

- species
- classification
- genus
- binomial nomenclature
- taxonomy
- domain
- evolution
- convergent evolution

**Academic Vocabulary**

- determine

**Connect** - TE/SB p. 450

- Connect It!
- Inquiry Warm-Up Lab: clean Up That Junk Drawer
- Quest Connection

**Investigate** - TE/SB pp. 451-454; 456

• ***u*Investigate Lab – Living Mysteries**

- Video – Classification Systems
- Interactivity – Classify It
- Virtual Lab – Madagascar Mystery
- Reading Check (p. 452)
- Literacy Connection (p. 452)
- Model It! (p.452)
- Math Toolbox (p.454)

**Synthesize** - TE/SB pp. 455; 457-458

- Reading Check (p.455; 457)
- Lab – A Mystery Organism No More!
- Quest Check-In Lab – Classifying Seeds
- Quest Check-In

**Demonstrate** – TE/SB p. 458

- Lesson 2 Check
- Lesson 2 Quiz

**Lesson 3 – Viruses, Bacteria, Protists, and Fungi**

**PE:** MS-LS1-1

**SEP:** Planning and Carrying Out Investigations

**DCI:**

**LS1.A** – Structure and Function

- All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1)

**CCC:** Scale, Proportion, and Quantity

**zSpace Activities (code)**

**What are Bacteria? (A564)**

[What Are Bacteria - Teacher Activity Plan](#)

This activity provides students with foundational knowledge about one type of cell, a bacterium.

[What are Bacteria? - Student Worksheet #1](#)

[What are Bacteria? - Student Worksheet #2](#)

[What are Bacteria? - Student Worksheet GoogleDoc](#)

**Savvas**

**Guiding Objectives:**

- Students will identify and describe evidence that explains what all living things are made of.
- Students will conduct an investigation to provide evidence that describes the characteristics of viruses, bacteria, protists, and fungi.
- Students will construct explanations that explain how viruses, bacteria, protists, and fungi interact with nature and people.

**Literacy Connection**

- Cite textual evidence

**Vocabulary**

- virus
- host
- vaccine
- bacteria
- protist
- parasite

**Academic Vocabulary**

- resistant

**Connect** - TE/SB p. 460

- Connect It!
- Class Discussion – The Smallest Living Things
- Quest Connection

**Investigate** - TE/SB pp. 461 - 468

- **uInvestigate Lab – Viruses by the Numbers**
- **uInvestigate Lab – Life in a Drop of Pond Water**
- Interactivity – Life as a Single Cell
- Interactivity – Bacteriophage Treatments
- Interactivity – Vaccines and Populations
- Video – Viruses, Bacteria, Protists, and Fungi
- Reading Check (pp.461; 462; 466; 467; 468)
- Math Toolbox (p.463)
- Model It! (p.464)
- Literacy Connection (p.466)

**Synthesize** - TE/SB pp. 469-470

- Interactivity – There’s Something Going Around
- Quest Check-In Interactivity – Discovering Rainforest Organisms
- Quest Check-In

**Demonstrate** – TE/SB p.470

- Lesson 3 Check
- Lesson 3 Quiz

### **Lesson 4 – Plants and Animals**

**PE:** MS-LS1-1; MS-LS1-2; MS-LS1-3

**SEP:** Developing and Using Models; Planning and Carrying Out Investigations; Engaging in Argument from Evidence

**DCI:**

**LS1.A – Structure and Function**

- All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1)
- Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2)
- 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:** Scale, Proportion, and Quantity; Systems and System Models; Structure and Function

#### **zSpace Activities (code)**

##### **Cell Differentiation (A079)**

[Cell Differentiation - Teacher Activity Plan](#)

In this activity, students will investigate how the physical shapes of cells allow them to perform their tasks more efficiently. Students will learn how different cells are organized into larger units to complete larger tasks.

[Cell Differentiation - Student Worksheet](#)

[Cell Differentiation - Student Worksheet GoogleDocs](#)

##### **Symbiotic Relationships (A283)**

[Symbiotic Relationships - Teacher Activity Plan](#)

In this activity, students will explore three kinds of symbiotic relationships: mutualism, in which both species benefit from the relationship; commensalism, in which one species benefits without affecting the other; and parasitism, in which one species benefits while the other is harmed.

[Symbiotic Relationships - Student Worksheet](#)

[Symbiotic Relationships - Student Worksheet GoogleDocs](#)

### **Savvas**

#### **Guiding Objectives:**

- Students will observe differences to identify the forms and functions of different plants and animals.
- Students will interpret data to determine an organism's characteristics.
- Students will cite text evidence to illustrate differences and similarities in plants and animal cells.
- Students will identify and describe animal traits

#### **Literacy Connection**

- Write Informative Text

#### **Vocabulary**

- tissue
- vascular plants
- nonvascular plants
- vertebrates
- invertebrates
- organ
- mammals

#### **Academic Vocabulary**

- symmetry

#### **Connect - TE/SB p. 472**

- Connect It!
- Write – So Many Cells
- Quest Connection

#### **Investigate - TE/SB pp. 473- 481**

- **Investigate Lab – Algae and Plants**
- Interactivity – Different Cells, Different Jobs
- Interactivity – Identifying an Organism
- Video – Plants and Animals
- Plan It! (p.477)
- Reading Check (pp.473; 475; 477; 479)
- Literacy Connection (p.478)

#### **Synthesize - TE/SB pp. 482-483**

- Interactivity – Organization of Organisms
- Reading Check (p.482)
- Quest Check-In Interactivity – Multicellular Rainforest Organisms
- Quest Check-In

#### **Demonstrate – TE/SB p.483**

- Lesson 4 Check
- Lesson 4 Quiz

<p><b>Topic Close</b></p> <ul style="list-style-type: none"> <li>• Topic 6 Assessment and Remediation TE/SB pp. 484-487</li> <li>• Quest Finding and Reflection TE/SB p. 487</li> </ul> <p><b>CLRI Literacy Connections:</b></p> <p><b>Enrichment: Independent Reading</b>          “The Vast Wonder of the World: Biologist Ernest Everett Just” by Mélina Mangal</p> <p><b>Synopsis:</b>          Read the story of biologist Ernest Everett Just and how he overcame prejudice and obstacles to become a pioneer in biological research in the study of how eggs control their own development.</p> <p><b>Enrichment: Independent Reading</b>          “Women in Science: Rachel Carson” by Anne Rooney</p> <p><b>Synopsis:</b> “Rachel Carson was a twentieth century marine biologist and science writer. Her book Silent Spring – on the harmful effects of pesticides – helped to boost the environmental movement in politics and change our understanding of how people affect nature. This book tells Rachel’s story.”</p> <p><b>Enrichment: Independent Reading</b>          “Urban Biologist: Danielle Lee” by Kari Cornell</p> <p><b>Synopsis:</b> “After earning degrees studying animal behavior, Danielle Lee wanted to share her science with young people. Through urban outreach she has brought budding scientists into professional labs. She’s walked them through the steps of the scientific method. And she’s shown them that science doesn’t have to be intimidating.”</p>	<p><b>Topic 10 Enrichment</b></p> <p><b>Topic 10 - Lesson 1 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment – What is Life</li> <li>• Case Study – The Tough and tiny Tardigrade</li> </ul> <p><b>Topic 10 - Lesson 2 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment – Classifying Life</li> <li>• Extraordinary Science – Classification: What’s a Panda?</li> </ul> <p><b>Topic 10 - Lesson 3 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment – Identifying Bacteria</li> <li>• uEngineer It! – Impact on Society – A Disease Becomes a Cure</li> <li>• Engineering Design Notebook – Attack of the Virus</li> <li>• Interactivity – Modifying a Virus</li> </ul> <p><b>Topic 10 – Lesson 4 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment – Plant and Animal Needs</li> </ul> <p><b>Topic 9 – Topic Close</b></p> <ul style="list-style-type: none"> <li>• uDemonstrate Lab – It’s Alive!</li> </ul>
<p><b>English Language Learners (ELL) Enhancements</b>          To access <a href="#">hyperlinked</a> material, you must be logged into your BPS Google Drive</p>	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>• <b>Cross- Linguistic Practices:</b> 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).</li> <li>• <b>Activating Prior Knowledge</b> 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.</li> <li>• <b>Visuals</b> - GIFs, pictures- will assist students in understanding what they are listening to. Use <b>visual thinking strategies</b> to set the lens for learning.</li> <li>• Video to review or introduce a topic – use <b>closed captioning</b> to help students see the words and pronunciations while they listen to the content.</li> <li>• <b>Word stretching / Vowel stretching</b> when instructing allows students to listen closely to the pronunciation of the word.</li> <li>• <b>Performance Level Descriptors</b> 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 6.</li> </ul>



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**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 6.

**Reading**

- Supplementary Text to help reinforce concepts.
- **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 6.

**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

**Special Education Modifications**

Special Education students must have accommodations as per Individual Educational Plan (IEP)

**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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	<p><b>Technology:</b></p> <ul style="list-style-type: none"> <li>● <b>Audio</b> reading of text</li> <li>● <b>Text to type</b> functions</li> <li>● <b>Videos</b> to clarify/visualize science concepts</li> <li>● <b>Record class lecture/discussions</b> and make accessible to student</li> <li>● <b>Nearpod-</b> interactive presentations of notes</li> </ul> <hr/> <p><b>In Class Assessments</b></p> <ul style="list-style-type: none"> <li>● Provide <b>multiple options</b> for projects</li> <li>● <b>Use of timer</b> in class</li> <li>● Break all <b>complex tasks</b> into chunks</li> </ul>
<p><b>Step Up to Writing</b>            Step Up to Writing            Materials can be            found in BPS Science            K-12 Schoology            Folder Grade 6            Resources Grade 6            SUTW materials</p>	<ul style="list-style-type: none"> <li>● Easy Two-Column Notes</li> <li>● Breaking Down Definitions</li> <li>● Paragraph Frame- What I Learned</li> <li>● <b>Performance Level Descriptors</b> 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 6.</li> </ul>
<p><b>Culturally and Linguistically Responsive Teaching (CLRT) in the Science Classroom</b></p>	<ul style="list-style-type: none"> <li>● Materials, resources, and/or discussions address diverse cultural backgrounds and real-world applications</li> <li>● Artifacts (posters, charts, etc.) in the science classroom are representative of the cultures of the student population</li> <li>● All students are given an opportunity to engage in science discourse</li> <li>● Teacher demonstrates high expectations for all students</li> </ul>