Providing Pathways to Excellence for Each Student

SCIENCE

UNWRAP A STANDARD: *WHAT DO STUDENTS HAVE TO KNOW AND BE ABLE TO DO?*

Domain: Life Science
Domain/Reporting Category Weight (if applicable)**:**

Standard: L1 Organisms are organized on a cellular basis and have a finite life span.

Performance/Achievement Level Descriptors

Emerging (1)	Developing (2)	Proficient (3)	Distinguished (4)
I can **identify** plant and animal cells	I can **differentiate between** components of plant and animal cells and their functions	I can **demonstrate** the relationship between structure and function in cells of plants and animals	I can **predict** how a change in structure affects function of plant and animal cells to reestablish internal stability (based on changes in external factors).

BUILDING BACKGROUND KNOWLEDGE AND SKILLS: FLASHBACK STANDARD

Standard: L1 (3-5) I can **demonstrate** that plants and animals (including humans) have internal and external structures that serve various functions that aid in growth, survival, behavior, and reproduction.

EXTENDING KNOWLEDGE AND SKILLS: PREVIEW STANDARD

Standard: L1 (HS) I can **demonstrate** cellular organization and processes to maintain homeostasis

Essential Knowledge/Concepts

What Do Students Need to Know/Understand?

List the underlined nouns.

Plants Animals Cells Functions
Roots Stems Leaves Flowers
Nucleus Organelles Cell Wall
Cell Membrane Cytoplasm Mitochondria
Ribosomes Golgi apparatus

Essential Skills

What Do Students Need to Be Able to Do?

List the circled (or *italicized*) verbs.

Identify Describe Explain
Differentiate Between Demonstrate
Predict

DOK Level

Level of content complexity rather than content difficulty.

DOK 1 DOK 2 DOK 3

WONDER Questions

How can we capture student wonder?

***Including open-ended and 'second' questions**

Why is cellular organization important for the survival of organisms?
What conclusions can we draw on how variations in cellular organization impact the life span of organisms in different environments?
How can we formulate a hypothesis on how advancements in medical technology can potentially extend the life span of organisms?

Essential Vocabulary

What Do Students Need to Comprehend?

List all key vocabulary

Plants Animals Cells Organisms
Functions Roots Stems Leaves
Flowers Nucleus Organelles Cell Wall
Cell Membrane Cytoplasm Ribosomes
Environments Mitochondria
Cellular Organization

Learning Objectives aligned to the Standard

What are the Learning Intentions and Success Criteria that will guide student progress?

See attached learning intentions and success criteria

Evidence of Student Mastery?

How will we know when they know it?
How will we encourage each student to try?

See attached diagnostic formative assessment (DFA)

Specific Instructional Framework?

What will we do to help them know/understand/can do it?
What will we do for students who still don't know it?
What will we do for students who already know it?

See attached thinking routines

Item #1: Alignment to ALD: Sci68.LC.**0** (Flashback to **Sci35.LC.1**)

Which internal structure in plants is responsible for transporting water and nutrients from the roots to the rest of the plant?

A. Leaves
B. Stem
C. Flowers
D. Roots

Item #2: Alignment to ALD: Sci68.LC.**1**

Circle all the following structures found in both plant and animal cells.

Chloroplast	Cell Wall	Central Vacuole	Nucleus

Item #3: Alignment to ALD: Sci68.LC.**2**

Which organelle contains digestive enzymes to break down waste and old cell parts?

A. Endoplasmic reticulum
B. Nucleolus
C. Lysosome
D. Chloroplast

Item #4: Alignment to ALD: Sci68.LC.**3**

Using pictures, words, and sentences, compare the structure of a plant cell and an animal cell.

Item #5: Alignment to ALD: Sci68.LC.**3**

In every cell of your body, there are structures called telomeres that are like the protective caps on the ends of shoelaces. Telomeres are essential for the cell division process, but with each cell division, they become shorter. As telomeres shorten, they eventually reach a point where the cell can no longer divide, leading to cell aging and ultimately cell death.

A. Explain in your own words what telomeres are and why they are important for cell division.

B. How does the shortening of telomeres affect the lifespan of cells?

Item #6: Alignment to ALD: Sci68.LC.**4**

Using the scenario in Item #5, hypothesize how altering the rate of telomere shortening could potentially impact the overall aging process in organisms.

My Learning Intention and Success Criteria **Science L.1**
Individual Component Version

Learning Intention: I am learning how organisms are organized on a cellular basis and have a finite life span.

My Success Criteria		Why am I learning this?
I can identify cellular components.	I'm There On My Way Getting Started	
I can explain cellular organization.	I'm There On My Way Getting Started	
I can describe life processes at the cellular level.	I'm There On My Way Getting Started	
I can identify plant and animal cells.	I'm There On My Way Getting Started	
I can differentiate between components of plant and animal cells and their functions.	I'm There On My Way Getting Started	
I can demonstrate the relationship between structure and function in cells of plants and animals	I'm There On My Way Getting Started	

Vocabulary:

Cells Plants Animals Functions Life Processes

Nucleus Life Span Cellular Organization Organelles

ELP:	**Standard:** **AZ.L1** Organisms are organized on a cellular basis and have a finite life span.

What stuck with me? Why is it important to remember?
(include any combination of images, numbers, and words)

Guided Group Lesson

Standard:

L1 Organisms are organized on a cellular basis and have a finite life span.

Group Members	Emerging	Developing	Proficient	Distinguished

Warm-Up:

Play a game of Triangle Trivia on the components and structures of plant and animal cells.

Vocabulary

Plants Animals Cells Organisms
Functions Roots Stems Leaves Flowers Nucleus
Organelles Cell Wall Cell Membrane Cytoplasm

Emerging	Developing	Proficient	Distinguished
Create a Venn Diagram comparing the components of animal cells and plant cells.	Pairs of students use their Think Pads to develop a 'Where do I Belong' chart demonstrating the relationship between structures and associated functions in cells of plants and animals	Analyze and evaluate the effectiveness of different cellular structures in maintaining internal stability in changing environments for both plants and animal cells.	Design an experiment to test how specific changes in cell structure affect the overall function and stability of plant and animal cells.

Observations:
What you notice about your students during small group instruction.

Next Steps:
What will you do with these students next? Change groups, repeat, etc.