



Science Standards

Grade 6B

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It is essential that these standards be addressed in contexts that promote scientific inquiry, use of evidence, critical thinking, making connections and communication.

LIFE SCIENCE

6.1L.1 - Compare and contrast the types and components of cells. Describe the functions and relative complexity of cells, tissues, organs, and organ systems.

Types of Cells

- Plant and animal cells have components (e.g. – membranes, organelles) that are both similar and different.
- Plant and animal cells can be differentiated by some of their unique cell components.

Functions

- Certain cell functions are similar in all living things (reproduction, movement of materials in/out, etc).
- Tissues, organs, and organ systems have specific functions.

Relative Complexity and Organization

- There are increasing levels of complexity from cell – tissue – organ – organ system.

Types of Organ Systems

- Endocrine, digestive, circulatory, nervous, muscular, reproductive, skeletal, etc.
- Vocabulary: cell wall - cellulose, chloroplast/chlorophyll, cell membrane, nucleus - cytoplasm, organism, endoplasmic reticulum, enzyme, flagella, mitochondria, prokaryote/ eukaryote, ribosome, Golgi bodies, vacuole

Possible learning targets: Underline the literacy component of each learning target.

Compare and contrast plant and animal cells.

Compare and contrast the components of cells.

Describe the functions of cells, tissues, organs, and organ systems.

Describe the relative complexity of cells, tissues, organs, and organ systems.

7.2L.2 - Explain the processes by which plants and animals obtain energy and materials for growth and metabolism.

Plants Obtain Energy through Photosynthesis

- Photosynthesis involves using the energy from sunlight to power a process to combine water and carbon dioxide to produce glucose and oxygen.
- Photosynthesis occurs in the chloroplasts which contain the photosynthetic pigment, chlorophyll.

Animals Obtain Energy from Materials Consumed

- Materials may be consumed from plants or other animals.
- Digestion/absorption provides cells with energy-containing materials.
- Inside animal cells, cellular metabolism converts materials into new cell products, such as proteins and sugars, and cellular respiration releases carbon dioxide and energy.
- Food chains/food webs (producers, consumers, scavengers, decomposers) transfer energy, originally from sunlight, to plants and animals.
- Vocabulary: metabolism, cellular respiration

Possible learning targets: Underline the literacy component of each learning target.

Explain the process by which plants obtain energy for growth.

Explain the process by which plants obtain energy for metabolism.

Explain the process by which plants obtain materials for growth.

Explain the process by which plants obtain energy for metabolism.

Explain the process by which animals obtain energy for growth.

Explain the process by which animals obtain energy for metabolism.

Explain the process by which animals obtain materials for growth.

Explain the process by which animals obtain energy for metabolism.

7.1L.1 - Compare and contrast sexual and asexual reproduction. Explain why reproduction is essential to the continuation of every species.

Differences Between Sexual and Asexual Reproduction

- Sexual reproduction results in genetic variation of offspring.
- Asexual reproduction results in genetically identical offspring.

Reproduction is Essential to Every Species

- Asexual reproduction results in the passing on of adaptive features (e.g. - inheritance of disease resistance).
- Sexual reproduction passes along adaptive features, but also provides the variations necessary for adaptation to changing conditions.
- In both types of reproduction, genetic variation can result from mutation.
- Vocabulary: fertilization, asexual reproduction, budding, clone, diversity/variation, generation/regeneration, mutation

Possible learning targets: Underline the literacy component of each learning target.

Compare and contrast sexual and asexual reproduction in both in plants and animals.

Explain why reproduction is essential to the continuation of every species.

EARTH/SPACE

6.1E.2 - Describe the properties of objects in the solar system. Describe the position of the sun within the solar system, galaxy, and universe.

Size, location and composition of

- Planets
- Dwarf Planets
- Moons
- Asteroids
- Meteoroid
- Comets

The Sun

- An Energy source
- Located at the center of Solar System

- A star located within Milky Way galaxy

Universe

- Countless number of galaxies make up the universe.
- Galaxies are made up of many star
- Vocabulary: solar system, galaxy, universe, orbit, revolution, moons/satellites, meteor, meteorite, Oort cloud, Kuiper Belt

Possible learning targets: Underline the literacy component of each learning target.

Describe the properties of objects in the solar system.

Describe the position of the sun within the solar system.

Describe the position of the sun within the galaxy.

Describe the position of the sun within the universe.

6.3 Scientific Inquiry: Scientific inquiry is the investigation of the natural world based on observation and science principles that includes proposing questions or hypotheses, and developing procedures for questioning, collecting, analyzing, and interpreting accurate and relevant data to produce justifiable evidence-based explanations

6.3S.1 - Based on observation and science principles propose questions or hypotheses that can be examined through scientific investigation. Design and conduct an investigation that uses appropriate tools and techniques to collect relevant data.

Scientific Investigation

- Propose questions or hypotheses
- Use observations and scientific principles
- Design a scientific investigation
- Identify appropriate tools and techniques
- Collect data relevant to the question or hypothesis

Vocabulary:

- Relevant data

6.2S.2 - Organize and display relevant data, construct an evidence-based explanation of the results of an investigation, and communicate the conclusions.

Results of an investigation

- Relevant data is organized and displayed (e.g. tables, graphs)
- Explanation of results is based on evidence obtained from the investigation
- Conclusions are communicated in a manner that relates to the original question or hypothesis

Vocabulary

- evidence-based

6.3S.3 - Explain why if more than one variable changes at the same time in an investigation, the outcome of the investigation may not be clearly attributable to any one variable.

Variables

- Investigation should deal with only one variable at a time.
- More than one variable may yield an outcome that is not clearly related to or caused by any individual variable.
- Independent variable (manipulated variable)
- Dependent variable/responding variable

Vocabulary

- variable
- control

6.4 Engineering Design: Engineering design is a process of identifying needs, defining problems, developing solutions, and evaluating proposed solutions

6.4D.1 - Define a problem that addresses a need and identify science principles that may be related to possible solutions.

Problem/solutions

- A need is identified and a problem defined to address that need
- Related scientific principles are identified that relate to possible solutions

Vocabulary

- Control

6.4D.2 - Design, construct, and test a possible solution to a defined problem using appropriate tools and materials. Evaluate proposed engineering design solutions to the defined problem.

Test a solution

- A solution (or possible solutions) to the defined problem should be designed, constructed, and then tested.
- Appropriate tools and materials are identified.
- The design solutions are evaluated as to how well they solve the problem.

Vocabulary

- design
- materials
- test

6.4D - Describe examples of how engineers have created inventions that address human needs and aspirations.

Necessary and desired Inventions

- Various descriptions of inventions created by engineers to address human needs and/or aspirations.

Vocabulary

- aspiration

Deconstruction of State Content Standards
 Salem-Keizer School District
Science 6

State Core Standard:
 6.1 - Structure and Function: Living and non-living systems are organized groups of related parts that function together and have characteristics and properties

State Content Standard:
 6.1L.1 - Compare and contrast the types and components of cells. Describe the functions and relative complexity of cells, tissues, organs, and organ systems.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Plant and animal cells • Function and organization of cells in tissues, organs, and organ systems. • Vocabulary: cell wall - cellulose, chloroplast/chlorophyll, cell membrane, nucleus - cytoplasm, organism, endoplasmic reticulum, enzyme, flagella, mitochondria, prokaryote/ eukaryote, ribosome, Golgi bodies, vacuole 	<ul style="list-style-type: none"> • Compare • Contrast • Describe

Explanation:

Types of Cells

- Plant and animal cells have components (e.g. – membranes, organelles) that are both similar and different.
- Plant and animal cells can be differentiated by some of their unique cell components.

Functions

- Certain cell functions are similar in all living things (reproduction, movement of materials in/out, etc).
- Tissues, organs, and organ systems have specific functions.

Relative Complexity and Organization

- There are increasing levels of complexity from cell – tissue – organ – organ system.

Types of Organ Systems

- Endocrine, digestive, circulatory, nervous, muscular, reproductive, skeletal, etc.

Possible learning targets: Underline the literacy component of each learning target.

- Compare and contrast plant and animal cells.
- Compare and contrast the components of cells.
- Describe the functions of cells, tissues, organs, and organ systems.
- Describe the relative complexity of cells, tissues, organs, and organ systems.

Textbook resources:

Book C: Cells and Heredity – Chapter 1

Deconstruction of State Content Standards
 Salem-Keizer School District
Science – 7

<p>State Core Standard: 7.2 - Interaction and change: The components and processes within a system interact.</p> <p>State Content Standard: 7.2L.2 – Explain the processes by which plants and animals obtain energy and materials for growth and metabolism.</p>

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Photosynthesis • Cellular respiration • Vocabulary: metabolism, cellular respiration 	<ul style="list-style-type: none"> • Explain • Compare • Contrast

Explanation:

Plants Obtain Energy through Photosynthesis

- Photosynthesis involves using the energy from sunlight to power a process to combine water and carbon dioxide to produce glucose and oxygen.
- Photosynthesis occurs in the chloroplasts which contain the photosynthetic pigment, chlorophyll.

Animals Obtain Energy from Materials Consumed

- Materials may be consumed from plants or other animals.
- Digestion/absorption provides cells with energy-containing materials.
- Inside animal cells, cellular metabolism converts materials into new cell products, such as proteins and sugars, and cellular respiration releases carbon dioxide and energy.
- Food chains/food webs (producers, consumers, scavengers, decomposers) transfer energy, originally from sunlight, to plants and animals.

Possible learning targets: Underline the literacy component of each learning target.

- Explain the process by which plants obtain energy for growth.
- Explain the process by which plants obtain energy for metabolism.
- Explain the process by which plants obtain materials for growth.
- Explain the process by which plants obtain energy for metabolism.
- Explain the process by which animals obtain energy for growth.
- Explain the process by which animals obtain energy for metabolism.
- Explain the process by which animals obtain materials for growth.
- Explain the process by which animals obtain energy for metabolism.

Textbook resources:

Book C Cells and Heredity – Chapter 2

Deconstruction of State Content Standards
 Salem-Keizer School District
Science – 7

State Core Standard:
 7.1 Structure and Function: Living and non-living systems are composed of components which affect the characteristics and properties of the system.

State Content Standard:
 7.1L.1 - Compare and contrast sexual and asexual reproduction. Explain why reproduction is essential to the continuation of every species.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Sexual and asexual reproduction in plants and animals • Reproduction and species continuation • Vocabulary: fertilization, asexual reproduction, budding, clone, diversity/variation, generation/regeneration, mutation 	<ul style="list-style-type: none"> • Compare and • Contrast • Explain

Explanation:

Differences Between Sexual and Asexual Reproduction

- Sexual reproduction results in genetic variation of offspring.
- Asexual reproduction results in genetically identical offspring.

Reproduction is Essential to Every Species

- Asexual reproduction results in the passing on of adaptive features (e.g. -inheritance of disease resistance).
- Sexual reproduction passes along adaptive features, but also provides the variations necessary for adaptation to changing conditions.
- In both types of reproduction, genetic variation can result from mutation.

Possible learning targets: Underline the literacy component of each learning target.

Compare and contrast sexual and asexual reproduction in both in plants and animals.

Explain why reproduction is essential to the continuation of every species.

Textbook resources:

Book C: Cells and Heredity – Chapter 3

Deconstruction of State Content Standards
 Salem-Keizer School District
Science 6

State Core Standard:
 6.1 - Structure and Function: Living and non-living systems are organized groups of related parts that function together and have characteristics and properties.

State Content Standard:
 6.1E.2 - Describe the properties of objects in the solar system. Describe the position of the sun within the solar system, galaxy, and universe.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Properties of objects in the solar system • Position of the planets • Position of the sun with the solar system, galaxy, and universe • Vocabulary: solar system, galaxy, universe, orbit, revolution, moons/satellites, meteor, meteorite, Oort cloud, Kuiper Belt 	<ul style="list-style-type: none"> • Describe

Explanation:

Size, location and composition of

- Planets
- Dwarf Planets
- Moons
- Asteroids
- Meteoroid
- Comets

The Sun

- An Energy source
- Located at the center of Solar System
- A star located within Milky Way galaxy

Universe

- Countless number of galaxies make up the universe.
- Galaxies are made up of many star

Possible learning targets: Underline the literacy component of each learning target.

Describe the properties of objects in the solar system.

Describe the position of the sun within the solar system.

Describe the position of the sun within the galaxy.

Describe the position of the sun within the universe.

Textbook Resources:

Book J: Astronomy – Chapter 3