



Science Standards

Grade 8

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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.

Core Standards:

- 8.1 - Structure and Function: Systems and their components function at various levels of complexity.
- 8.2 - Interaction and Change: Systems interact with other systems.

Content Standards:

PHYSICS:

6.2P.2 - Describe the relationships between: electricity and magnetism, static and current electricity, and series and parallel electrical circuits.

Relationships

- Electricity and magnetism
- Static and current electricity
- Series and parallel circuits
- Vocabulary: open/closed circuit, conductor, insulator, resistance, electromagnetic field, ampere (amps), ohm, series, parallel, circuit, switch, voltage

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

Describe the difference between static electricity and current electricity.

Describe the relationship between electricity and magnetism.

Describe that electricity can cause magnetism of specific objects and magnetic objects can generate electricity.

Compare and contrast series and parallel circuits.

CHEMISTRY:

8.1P.1 - Describe the atomic model and explain how the types and arrangements of atoms determine the physical and chemical properties of elements and compounds.

Atomic Model

- Particles in an atom and where they are located (i.e., electrons orbit around a nucleus of protons and neutrons)
- Different atoms have different numbers of particles and different atomic masses.

Qualitative description of bonding

- The outermost electrons are involved to join atoms together.
- Different numbers of atoms join together to create different compounds (e.g. oxygen joins with 2 hydrogen to form a new compound with different properties than the original elements, sodium + chlorine = salt).

- Vocabulary: nucleus, proton, neutron, electron, electron cloud, chemical properties, elements, compounds, molecule, atomic mass

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

Illustrate and describe the Atomic Model in terms of particles and charges.

Contrast physical and chemical properties.

Explain how the types and arrangement of atoms determine the chemical properties of elements.

Explain how the types and arrangement of atoms determine the physical properties of elements.

Explain how the types and arrangements of atoms determine the chemical properties of compounds.

Explain how the types and arrangements of atoms determine the physical properties of compounds.

8.1P.2 - Explain how the Periodic Table is an organization of elements based on their physical and chemical properties.

Periodic Table

- A tool for organizing elements based on properties and characteristics
- Metal/nonmetals/metalloids are areas on the Periodic Table and those elements share common characteristics.
- Noble gasses are stable elements.
- Atomic number gives us information about the atom.
- Atomic mass is an average mass of the isotopes of that type of atom.
- Rows and columns have meaning.
- Vocabulary: metal, non-metal, metalloid, family, period, isotope, atomic mass, atomic number, noble gases

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

Compare and contrast metals, non-metals and metalloids.

Describe the reactivity between different families or groups of the periodic table.

Explain how the Periodic Table is an organization of elements based on their physical and chemical properties.

EARTH-SPACE:

8.2E.2 - Describe the processes of Earth's geosphere and the resulting major geological events

Rock Cycle

Igneous Rocks

Sedimentary Rocks

Metamorphic Rocks

Plate Tectonics

Continental Drift

Sea Floor Spreading

Lithospheric (crustal) Plates

Plate Boundaries (constructive, destructive)

Convection currents

Volcanoes

Patterns

Causes

Earthquakes

Stresses

Seismic wave

Fault zones

Effects

Mountain Building

Uplift

Folded Mountains

Fault block Mountains

Volcanic

- Vocabulary: crust, mantle, lithosphere, divergent boundary, convergent boundary, transformed boundary, ridges/trenches, faults, subduction, continental drift, Pangaea, convection, cementation, crystallization, fossilization, magnetic reversals, metamorphism, minerals, plateau

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

Create a model of the layers of the Earth.

Explain the theory of plate tectonics and how plate movement relates to constructive and destructive forces.

Describe the processes of the Earth's geosphere.

Describe the major geological events resulting from the processes of Earth's geosphere

8.2E.3 - Explain the causes of patterns of atmospheric and oceanic movement and the effects on weather and climate.

Atmospheric Movement

- Differential heating
- Coriolis effect
- Wind
- Air Pressure
- Convection
- Rain shadow

Oceanic Movement

- Convection
- Ocean currents
 - o Deep
 - o Surface
 - o Upwelling

Weather vs. Climate

Types of Weather Fronts

- Conditions
- Types
- Vocabulary: windward, air mass, differential, elevation, jet stream, leeward, prevailing, relative humidity, saturated

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

Differentiate between weather and climate.

Explain the causes of patterns of atmospheric movement.

Explain the causes of patterns of oceanic movement.

Explain the effects of patterns of atmospheric movement on weather.

Explain the effects of patterns of atmospheric movement on climate

Explain the effects of patterns of oceanic movement on weather.

Explain the effects of patterns of oceanic movement on climate.

7.2E.1 - Describe and evaluate the environmental and societal effects of obtaining, using, and managing waste of renewable and non-renewable resources.

Renewable resources

- Solar Energy
- Hydroelectric energy
- Wind energy
- Wave Energy

- Geothermal
- Other types of renewable energy
- Benefits and drawbacks

Non-Renewable resources

- Nuclear energy
- Fossil fuels
- Benefits and drawbacks

Obtaining resources

- Mining
- Recycling

Using resources

- How they are used
- Transformations of energy

Managing waste

- Incinerating
- Garbage Dumps
- Recycling

- Vocabulary: renewable resources, nonrenewable resources, limited resource, fossil fuels, disposable, landfill, nuclear, runoff, societal

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

Distinguish between renewable and nonrenewable resources.

Describe the societal and environmental effects of obtaining renewable and nonrenewable resources.

Describe the environmental effects of managing waste of renewable and nonrenewable resources.

7.2E.3 - Evaluate natural processes and human activities that affect global environmental change and suggest and evaluate possible solutions to problems.

Natural Processes

- Natural cycles affect global climate (e.g. Milankovitch cycles, cycles involving Earth's rotation and carbon cycle)
- Natural cycles can lead to cooling, warming or other environmental affects (e.g. Ice Ages, volcanic activity, meteorite impact)

Human Activities

- Human activity/use has environmental impacts.
- (e.g. deforestation, farming, fossil fuels, chemicals released into the atmosphere)
- Human activity/use can have a positive or negative effect on the environment.

Global vs. Regional Changes

- Vocabulary: pollution, deforestation, carbon footprint, combustion, fuel efficiency, solar-electric, wind power

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

Evaluate both human (pollution, deforestation) and natural factors (fire, floods) that affect global environmental change.

Suggest and evaluate possible solutions associated with global environmental change.

LIFE SCIENCE:

8.1L.1 - Explain how genetics and anatomical characteristics are used to classify organisms and infer evolutionary relationships.

Classification and Anatomical Characteristics

- Organisms can be classified or grouped according to the similarities of their anatomical characteristics.
- Organisms having similar structures are part of the evidence that they have a common origin (ancestry).
- Example: vertebrates are all animals with a vertebral column, while invertebrates lack a vertebral column.

Classification and Genetics

- Organisms with similar genetic makeup are more closely related and thus will have more similar anatomical characteristics.
- The degree or percentage of similarity of the DNA is a measure of how closely organisms are related.
- Evolutionary diagrams show the relative distance vs. closeness of evolutionary relationships.

- Vocabulary: classification, anatomy, embryo

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

Describe anatomical characteristics and adaptations.

Explain how anatomical characteristics are used to infer evolutionary relationships.

Explain how genetics is used to classify organisms.

Explain how genetics is used to infer evolutionary relationships.

8.2L.1 - Explain how species change through the process of natural selection. Describe evidence for evolution.

Species Change Over Time

- Fossil record shows changes in related species over time. Example: dinosaur bone structures show many similarities to fossil and modern birds, suggesting that birds have evolved from dinosaurs through gradual change.
- Closely related living species also demonstrate that changes have occurred in some of their anatomical features. Example: Darwin's Finches are closely related but have different bill structure depending on their adaptation to particular food supplies.

Species Change as a Result of Natural Selection

- Variations occur in the population of a species through changes in their genetic material (DNA on chromosomes).
 - More offspring are produced than can survive due to limiting factors in their environment.
 - Natural selection factors, such as changes in environment, food supply, predators, or disease, will select for those individuals of the species best able to survive, and these, in turn, will pass along their genetics to their offspring. Example: when antibiotics are applied to a population of bacteria, most of the bacteria die, but some are resistant to the antibiotic and pass on this resistance to their offspring.
 - Failure of a species to have variations needed for survival under changing conditions can lead to extinction.
- Vocabulary: natural selection, variation, evolution, adaptation, species, homologous structures, adaptation, niche, random

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

Explain how species change through the process of natural selection

Describe evidence for evolution

Compare adaptations and variation within species.

8.2E.4 - Analyze evidence for geologic, climatic, environmental, and life form changes over time.

Geologic Evidence

- Fossils
- Relative age dating
- Superposition
- Radioactive dating
- Rock cycle

Climatic Evidence

- Ice core analysis
- Climate change
- El Niño/La Niña

Environmental Evidence

- Change in habitat

Life Form Evidence

- Evolution
- Fossils

- Vocabulary: relative dating, fossil, extinction, absolute age, core sample, deposits

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

Recognize that Earth is a dynamic, constantly changing planet.

Analyze evidence for geologic change over time

Analyze evidence for climatic change over time

Analyze evidence for environmental change over time

Analyze evidence for life form changes over time

8.3 Scientific Inquiry: Scientific inquiry is the investigation of the natural world based on observations and science principles that includes proposing questions or hypotheses and designing procedures for questioning, collecting, analyzing, and interpreting multiple forms of accurate and relevant data to produce justifiable evidence-based explanations and new explorations.

8.3S.1 - Based on observations and science principles propose questions or hypotheses that can be examined through scientific investigation. Design and conduct a scientific investigation that uses appropriate tools, techniques, independent and dependent variables, and controls to collect relevant data.

Variables

- Independent
- Dependent

Experimental Controls including

- Temperature
- Light
- Size
- Shape
- Mass

Appropriate Tools & Techniques including

- Microscope
- Scale
- Thermometer

Vocabulary:

- relevant

8.3S.2 - Organize, display, and analyze relevant data, construct an evidence-based explanation of the results of a scientific investigation, and communicate the conclusions including possible sources of error. Suggest new investigations based on analysis of results.

Results of an investigation

- Display of results to aid in analysis
- Communicate sources of error
- Analyze results and suggest new investigations

Vocabulary:

- approximation
- estimation
- investigation

8.3S.3 - Explain how scientific explanations and theories evolve as new information becomes available.

History of Science

- Evolution of scientific theories
- Impact of new technologies on current thinking

Role of Evidence in Explanations

Vocabulary:

- theory

8.4 Engineering Design: Engineering design is a process of identifying needs, defining problems, identifying design criteria and constraints, developing solutions, and evaluating proposed solutions.

8.4D.1 - Define a problem that addresses a need, and using relevant science principles investigate possible solutions given specified criteria, constraints, priorities, and trade-offs.

Possible design solutions need to address specified:

- Criteria
- Constraints
- Priorities
- Trade-offs

Examples of Structural Engineering

- Bridge construction
- Engineering design failures
- Earthquake resistant buildings

Vocabulary:

- structural

8.4D.2 - Design, construct, and test a proposed engineering design solution and collect relevant data. Evaluate a proposed design solution in terms of design and performance criteria, constraints, priorities, and trade-offs. Identify possible design improvements.

Propose a Solution

Design a prototype solution

Test and evaluate a solution in terms of-

- Design and performance criteria
- Constraints
- Priorities
- Trade-offs

Identify improvements that may be possible for the design

Vocabulary:

- durability
- redesign
- retest

8.4D.3 - Explain how creating a new technology requires considering societal goals, costs, priorities, and trade-offs.

New technologies need to consider:

- Societal goals
- Costs (not just monetary)
- Priorities
- Trade-offs
- Impacts (societal, environmental)

Vocabulary:

- revolution (technological)

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

State Core Standard:

6.2 - Interaction and Change: The related parts within a system interact and change.

State Content Standard:

6.2P.2 - Describe the relationships between: electricity and magnetism, static and current electricity, and series and parallel electrical circuits.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Relationship between electricity and magnetism • Relationship between static and current electricity • Relationship between series and parallel electrical circuits • Vocabulary: open/closed circuit, conductor, insulator, resistance, electromagnetic field, ampere (amps), ohm, series, parallel, circuit, switch, voltage 	<ul style="list-style-type: none"> • Describe • Compare • Contrast • Demonstrate

Explanation:

Relationships

- Electricity and magnetism
- Static and current electricity
- Series and parallel circuits

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

Describe the difference between static electricity and current electricity.

Describe the relationship between electricity and magnetism.

Describe that electricity can cause magnetism of specific objects and magnetic objects can generate electricity.

Compare and contrast series and parallel circuits.

Textbook resources:

Book N: Electricity and Magnetism – Chapters 1 and 3

Deconstruction of State Content Standards
Salem-Keizer School District
Science 8

State Core Standard:

8.1 - Structure and Function: Systems and their components function at various levels of complexity.

State Content Standard:

8.1P.1 - Describe the atomic model and explain how the types and arrangements of atoms determine the physical and chemical properties of elements and compounds.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Atomic Model • Chemical properties/physical properties • Chemical changes/physical changes • Vocabulary: nucleus, proton, neutron, electron, electron cloud, chemical properties, elements, compounds, molecule, atomic mass 	<ul style="list-style-type: none"> • Illustrate • Describe • Distinguish • Explain

Explanation:

Atomic Model

- Particles in an atom and where they are located (i.e., electrons orbit around a nucleus of protons and neutrons)
- Different atoms have different numbers of particles and different atomic masses.

Qualitative description of bonding

- The outermost electrons are involved to join atoms together.
- Different numbers of atoms join together to create different compounds (e.g. oxygen joins with 2 hydrogen to form a new compound with different properties than the original elements, sodium + chlorine salt).

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

Illustrate and describe the Atomic Model in terms of particles and charges.

Contrast physical and chemical properties.

Explain how the types and arrangement of atoms determine the chemical properties of elements.

Explain how the types and arrangement of atoms determine the physical properties of elements.

Explain how the types and arrangements of atoms determine the chemical properties of compounds.

Explain how the types and arrangements of atoms determine the physical properties of compounds.

Textbook resources:

Book K: Chemical Building Blocks – Chapter 3

Book L: Chemical Interactions – Chapter 1

Deconstruction of State Content Standards
Salem-Keizer School District
Science 8

State Core Standard:

8.1 - Structure and Function: Systems and their components function at various levels of complexity.

State Content Standard:

8.1P.2 - Explain how the Periodic Table is an organization of elements based on their physical and chemical properties.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none">• Metals, Non-Metals and Metalloids• Reactivity between different families or groups of the periodic table • Vocabulary: metal, non-metal, metalloid, family, period, isotope, atomic mass, atomic number, noble gases	<ul style="list-style-type: none">• Compare• Contrast• Analyze

Explanation

Periodic Table

- A tool for organizing elements based on properties and characteristics
- Metal/nonmetals/metalloids are areas on the Periodic Table and those elements share common characteristics.
- Noble gasses are stable elements.
- Atomic number gives us information about the atom.
- Atomic mass is an average mass of the isotopes of that type of atom.
- Rows and columns have meaning.

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

Compare and contrast metals, non-metals and metalloids.

Describe the reactivity between different families or groups of the periodic table.

Explain how the Periodic Table is an organization of elements based on their physical and chemical properties.

Textbook resources:

Book K: Chemical Building Blocks – Chapter 3

Book L: Chemical Interactions – Chapter 1

Deconstruction of State Content Standards
Salem-Keizer School District
Science 8

State Core Standard:

8.2 - Interaction and Change: Systems interact with other systems.

State Content Standard:

8.2E.2 - Describe the processes of Earth's geosphere and the resulting major geological events.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • The layers of the Earth. • The theory of plate tectonics and how plate movement relates to constructive and destructive forces • Vocabulary: crust, mantle, lithosphere, divergent boundary, convergent boundary, transformed boundary, ridges/trenches, faults, subduction, continental drift, Pangaea, convection, cementation, crystallization, fossilization, magnetic reversals, metamorphism, minerals, plateau 	<ul style="list-style-type: none"> • Create a model • Describe • Explain

Explanation:

Rock Cycle

Igneous Rocks
 Sedimentary Rocks
 Metamorphic Rocks

Plate Tectonics

Continental Drift
 Sea Floor Spreading
 Lithospheric (crustal) Plates
 Plate Boundaries (constructive, destructive)
 Convection currents

Volcanoes

Patterns
 Causes

Earthquakes

Stresses
 Seismic wave

Fault zones
Effects
Mountain Building
Uplift
Folded Mountains
Fault block Mountains
Volcanic

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

Create a model of the layers of the Earth.

Explain the theory of plate tectonics and how plate movement relates to constructive and destructive forces.

Describe the processes of the Earth's geosphere.

Describe the major geological events resulting from the processes of Earth's geosphere

Textbook resources:

Book F: Inside Earth – Chapters 1-3

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

State Core Standard:

8.2 - Interaction and Change: Systems interact with other systems

State Content Standard:

8.2E.3 - Explain the causes of patterns of atmospheric and oceanic movement and the effects on weather and climate.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Difference between weather and climate • How air and ocean currents affect weather and climate • Vocabulary: windward, air mass, differential, elevation, jet stream, leeward, prevailing, relative humidity, saturated 	<ul style="list-style-type: none"> • Explain • Differentiate

Explanation:

Atmospheric Movement

- Differential heating
- Coriolis effect
- Wind
- Air Pressure
- Convection
- Rain shadow

Oceanic Movement

- Convection
- Ocean currents
 - o Deep
 - o Surface
 - o Upwelling

Weather vs. Climate

Types of Weather Fronts

- Conditions
- Types

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

Differentiate between weather and climate.

Explain the causes of patterns of atmospheric movement.

Explain the causes of patterns of oceanic movement.

Explain the effects of patterns of atmospheric movement on weather.

Explain the effects of patterns of atmospheric movement on climate.

Explain the effects of patterns of oceanic movement on weather.

Explain the effects of patterns of oceanic movement on climate.

Textbook resources:

Book I: Weather and Climate – Chapters 1-4

Book H: Earth's Waters – Chapter 3

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

State Core Standard:

7.2 - Interaction and Change: The components and processes within a system interact.

State Content Standard:

7.2E.1 - Describe and evaluate the environmental and societal effects of obtaining, using, and managing waste of renewable and non-renewable resources.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Renewable and nonrenewable resources • Use of resources • Waste management • Societal effects • Vocabulary: renewable resources, nonrenewable resources, limited resource, fossil fuels, disposable, landfill, nuclear, runoff, societal 	<ul style="list-style-type: none"> • Distinguish • Evaluate • Describe

Explanation:

Renewable resources

- Solar Energy
- Hydroelectric energy
- Wind energy
- Wave Energy
- Geothermal
- Other types of renewable energy
- Benefits and drawbacks

Non-Renewable resources

- Nuclear energy
- Fossil fuels
- Benefits and drawbacks

Obtaining resources

- Mining
- Recycling

Using resources

- How they are used
- Transformations of energy

Managing waste

- Incinerating
- Garbage Dumps
- Recycling

Possible learning targets: *Underline the literacy component of each learning target.*
Distinguish between renewable and nonrenewable resources.
Describe the societal and environmental effects of obtaining renewable and nonrenewable resources.
Describe the environmental effects of managing waste of renewable and nonrenewable resources.

Textbook resources:

Book E: Environmental Science – Chapters 3-5

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

State Core Standard:

7.2 - Interaction and Change: The components and processes within a system interact.

State Content Standard:

7.2E.3 - Evaluate natural processes and human activities that affect global environmental change and suggest and evaluate possible solutions to problems.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • How natural processes affect global environmental change • How human activities affect global environmental change • Possible solutions to the environmental problems • Vocabulary: pollution, deforestation, carbon footprint, combustion, fuel efficiency, solar-electric, wind power 	<ul style="list-style-type: none"> • Evaluate • Suggest

Explanation:

Natural Processes

- Natural cycles affect global climate (e.g. Milankovitch cycles, cycles involving Earth's rotation and carbon cycle)
- Natural cycles can lead to cooling, warming or other environmental affects (e.g. Ice Ages, volcanic activity, meteorite impact)

Human Activities

- Human activity/use has environmental impacts.
- (e.g. deforestation, farming, fossil fuels, chemicals released into the atmosphere)
- Human activity/use can have a positive or negative effect on the environment.

Global vs. Regional Changes

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

Evaluate both human (pollution, deforestation) and natural factors (fire, floods) that affect global environmental change.

Suggest and evaluate possible solutions associated with global environmental change.

Textbook resources:

Book E: Environmental Science – Chapters 4 and 5

**Deconstruction of State Content Standards
Salem-Keizer School District
Science 8**

State Core Standard:

8.2 - Interaction and Change: Systems interact with other systems.

State Content Standard:

8.1L.1 - Explain how genetics and anatomical characteristics are used to classify organisms and infer evolutionary relationships.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Anatomical characteristics and adaptations. • Genetics connection to classification and evolution • Vocabulary: classification, anatomy, embryo 	<ul style="list-style-type: none"> • Describe • Explain • Infer • Classify

Explanation:

Classification and Anatomical Characteristics

- Organisms can be classified or grouped according to the similarities of their anatomical characteristics.
- Organisms having similar structures are part of the evidence that they have a common origin (ancestry).
- Example: vertebrates are all animals with a vertebral column, while invertebrates lack a vertebral column.

Classification and Genetics

- Organisms with similar genetic makeup are more closely related and thus will have more similar anatomical characteristics.
- The degree or percentage of similarity of the DNA is a measure of how closely organisms are related.
- Evolutionary diagrams show the relative distance vs. closeness of evolutionary relationships.

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

Describe anatomical characteristics and adaptations.

Explain how anatomical characteristics are used to infer evolutionary relationships.

Explain how genetics is used to classify organisms.

Explain how genetics is used to infer evolutionary relationships.

Textbook resources:

Book A: From Bacteria to Plants – Chapter 1

Book C: Cells and heredity – Chapter 5

**Deconstruction of State Content Standards
Salem-Keizer School District
Science 8**

State Core Standard:

8.2 - Interaction and Change: Systems interact with other systems.

State Content Standard:

8.2L.1 - Explain how species change through the process of natural selection. Describe evidence for evolution.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Natural selection. • Adaptations and variation. • Vocabulary: natural selection, variation, evolution, adaptation, species, homologous structures, adaptation, niche, random 	<ul style="list-style-type: none"> • Describe • Compare • Explain

Explanation:

Species Change Over Time

- Fossil record shows changes in related species over time. Example: dinosaur bone structures show many similarities to fossil and modern birds, suggesting that birds have evolved from dinosaurs through gradual change.
- Closely related living species also demonstrate that changes have occurred in some of their anatomical features. Example: Darwin's Finches are closely related but have different bill structure depending on their adaptation to particular food supplies.

Species Change as a Result of Natural Selection

- Variations occur in the population of a species through changes in their genetic material (DNA on chromosomes).
- More offspring are produced than can survive due to limiting factors in their environment.
- Natural selection factors, such as changes in environment, food supply, predators, or disease, will select for those individuals of the species best able to survive, and these, in turn, will pass along their genetics to their offspring. Example: when antibiotics are applied to a population of bacteria, most of the bacteria die, but some are resistant to the antibiotic and pass on this resistance to their offspring.
- Failure of a species to have variations needed for survival under changing conditions can lead to extinction.

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

Explain how species change through the process of natural selection

Describe evidence for evolution

Compare adaptations and variation within species.

Textbook resources:

Book C: Cells and Heredity – Chapter 5

**Deconstruction of State Content Standards
Salem-Keizer School District
Science 8**

State Core Standard:

8.2 - Interaction and Change: Systems interact with other systems.

State Content Standard:

8.2E.4 - Analyze evidence for geologic, climatic, environmental, and life form changes over time.

What does this standard require students to ...

KNOW? (Concepts)	DO? (Skills&/or Reasoning)
<ul style="list-style-type: none"> • Earth is a dynamic, constantly changing planet. • Vocabulary: relative dating, fossil, extinction, absolute age, core sample, deposits 	<ul style="list-style-type: none"> • Recognize • Analyze

Explanation:

Geologic Evidence

- Fossils
- Relative age dating
- Superposition
- Radioactive dating
- Rock cycle

Climatic Evidence

- Ice core analysis
- Climate change
- El Niño/La Niña

Environmental Evidence

- Change in habitat

Life Form Evidence

- Evolution
- Fossils

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

Recognize that Earth is a dynamic, constantly changing planet.

Analyze evidence for geologic change over time

Analyze evidence for climatic change over time

Analyze evidence for environmental change over time

Analyze evidence for life form changes over time

Textbook resources:

Book C: Cells and Heredity – Chapter 5