

## Grade 9 General Science Scope & Sequence

<u>First Unit</u>	Textbook & Materials	Supplements	Assessment Options
Scientific Method	Glencoe: Physical Science Chapter 1 pgs 4-35	Glencoe resource packet Chapter 1	<p><b><u>Formative</u></b></p> <ul style="list-style-type: none"> <li>• Exp. Variables</li> <li>• Measurement Lab</li> <li>• Graphing activities</li> <li>• Penny Lab</li> </ul> <p><b><u>Summative</u></b></p> <ul style="list-style-type: none"> <li>• Unit exam (see division chair)</li> </ul>
<b>Days/Weeks</b>			
Minimum: 5 days Maximum: 7 days			

**Oregon Science Standards:**

**H.3 Scientific Inquiry**

**H.3S.1** Based on observations and science principles, formulate a question or hypothesis that can be investigated through the collection and analysis of relevant information.

**H.4 Engineering and Design**

**H.4D.3** Analyze data, identify uncertainties, and display data so that the implications for the solution being tested are clear.

**Common Core Standards for Literacy in Science: Reading**

**RST.9-10.3** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

**RST.9-10.7** Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**RST.9-10.9** Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

Vocabulary and Targets in *italics* are introduced during this unit.

## **Common Core Standards for Literacy in Science: Writing**

**WHST.9-10.2** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

### **Critical Content Vocabulary:**

Independent variable  
Dependent variable  
Control  
Constant  
Metric units  
Metric system  
Hypothesis  
Data  
Observation  
Bias

### **Common Core Reading Vocabulary:**

Multistep procedure, experiment, technical task, quantitative information, equation, formats, compare, contrast, contradict

### **Common Core Writing Vocabulary:**

Organizational structure, formatting structure domain-specific vocabulary, transition, cohesion

### **Critical Content Learning Targets:**

- I can identify the control, independent, and dependent variables in an experiment.
- I can identify metric units.
- I can correctly measure using the metric system.
- I can create a graph based on data collected in an experiment.

### **Common Core Reading Learning Targets:**

- I can identify the steps necessary when carrying out experiments, taking measurements, or performing technical tasks
- I can precisely follow a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- I can identify quantitative or technical information in a text when expressed visually (e.g., tables, charts, graphs), mathematically (e.g., in an equation), and in words.
- I can translate quantitative or technical information expressed in words into visual form
- I can translate information into words that is expressed visually or mathematically in a text.
- I can explain that information can be gained from experiments, simulations, video, multimedia sources, or by reading a text on the same topic.
- I can compare and contrast ( analyze the similarities and differences) information gained from my own experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

### **Common Core Writing Learning Targets:**

- I can select a historical event, scientific procedure/experiment, or technical process and identify and gather relevant and appropriate information (e.g., well-chosen facts, definitions, details, quotations, examples) to share with my audience.

Vocabulary and Targets in *italics* are introduced during this unit.

## Grade 9 General Science Scope & Sequence

<u>Second Unit</u>	Textbook & Materials	Supplements	Assessment Options
Phases of Matter	Glencoe: Physical science Chapter 16 (pgs 486-515) Chapter 6 (pgs 158-170)	Glencoe resource packet Chapter 6 and 16  Univ. of Colorado Interactive Simulations <a href="http://phet.colorado.edu/en/simulation/states-of-matter">http://phet.colorado.edu/en/simulation/states-of-matter</a>	<p><b><u>Formative</u></b></p> <ul style="list-style-type: none"> <li>• Sodium thio. Lab</li> </ul> <p><b><u>Summative</u></b></p> <ul style="list-style-type: none"> <li>• Unit Test (see division chair)</li> </ul>
<b>Days/Weeks</b>			
Minimum: 8 days Maximum: 10 days			

**Oregon Science Standards:**

**H.2 Interaction and change**

**H.2P.2** Explain how physical and chemical changes demonstrate the law of conservation of mass.

**Common Core Standards for Literacy in Science: Reading**

**RST.9-10.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

**RST.9-10.5** Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

**Common Core Standards for Literacy in Science: Writing**

**WHST.9-10.9** Draw evidence from informational texts to support analysis, reflection, and research.

**Critical Content Vocabulary:**

Solid	thermal expansion
Liquid	kinetic theory
Gas	temperature
Plasma	heat
Melting point	convection
Boiling point	conduction
Condensing	radiation
Freezing point	
Sublimation	

**Common Core Reading Vocabulary:**

Content specific vocabulary, structure and relationships

**Common Core Writing Vocabulary:**

Textual evidence, analysis, reflection, and/or research

**Critical Content Learning Targets:**

- I can use the kinetic theory to identify and describe the four phases of matter.
- I can identify the phase changes of matter.
- I can explain the difference between heat and temperature.
- I can describe and identify three ways that heat can be transferred.

**Common Core Reading Learning Targets:**

- I can identify symbols, key terms, and words or phrases (e.g., Fe=iron, laser, survival of the fittest) when used in a scientific/technical context.
- I can locate and use resources (e.g., glossary, footnote, dictionary) to assist me in determining the meaning of unknown symbols, key words, and phrases.
- I can identify key terms and concepts in a text.
- I can analyze the structure of the relationships among key terms and concepts in a text.
- I can explain the relationship among key terms in a text.

**Common Core Writing Learning Targets:**

- I can compose written responses and include textual evidence to strengthen my analysis, reflection, and/or research

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<b><u>Third Unit</u></b>	<b>Textbook &amp; Materials</b>	<b>Supplements</b>	<b>Assessment Options</b>
Atomic Structure and Periodic Table	Glencoe textbook Chapter 18 (pgs 542-571)	Glencoe resource packet Chapter 18	<p><b><u>Formative:</u></b></p> <ul style="list-style-type: none"> <li>• Alien activity</li> <li>• Atomic models</li> </ul> <p><b><u>Summative:</u></b></p> <ul style="list-style-type: none"> <li>• Unit Test (see division chair)</li> </ul>
<b>Days/Weeks</b>			
Minimum: 14 days Maximum: 18 days			

### **Oregon Science Standards:**

#### **H.1 Structure and Function**

**H.1P.1** Explain how atomic structure is related to the properties of elements and their position in the Periodic Table. Explain how the composition of the nucleus is related to isotopes and radioactivity.

#### **Common Core Standards for Literacy in Science: Reading**

**RST.9-10.1** Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

**RST.9-10.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

**RST.9-10.7** Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

Vocabulary and Targets in *italics* are introduced during this unit.

**Critical Content Vocabulary:**

Proton	chemical properties
Neutron	physical properties
Electron	ion
Atom	valence electrons
Atomic structure	reactive
Atomic mass	non-reactive
Atomic number	group
Isotope	period
Periodic table	

**Common Core Reading Vocabulary:**

Textual evidence, explicit, precise detail, content specific vocabulary, quantitative information, equation, formats

**Critical Content Learning Targets:**

- I can identify and locate the three subatomic particles.
- I can use the periodic table to find
  - protons, neutrons, electrons, atomic and mass number
    - groups, periods and regions
    - valence electrons and energy levels
- I can compare and contrast the isotopes of the same element.

**Common Core Reading Learning Targets:**

- I can read closely and find explicit (right there) information in science and technical texts.
- I can identify symbols, key terms, and words or phrases (e.g., Fe=iron, laser, survival of the fittest) when used in a scientific/technical context.
- I can use various strategies (e.g., context clues, root words, affixes) to determine the meaning of symbols, key terms, and scientific/technical words or phrases in a text.
- I can locate and use resources ( e.g., glossary, footnote, dictionary) to assist me in determining the meaning of unknown symbols, key terms, words and phrases.
- I can identify quantitative or technical information in a text when expressed visually (e.g., tables, charts, graphs), mathematically (e.g., in an equation), and in words
- I can translate quantitative or technical information expressed in words into visual form.
- I can translate information into words that is expressed visually or mathematically in a text.

## Grade 9 General Science Scope & Sequence

<b><u>Fourth Unit</u></b>	<b>Textbook &amp; Materials</b>	<b>Supplements</b>	<b>Assessment Options</b>
Chemical Bonding and Reactions	Glencoe: Physical science Chapter 19 (pgs 572-601)	Glencoe Resource packet Chapter 19	<b><u>Formative:</u></b> <ul style="list-style-type: none"> <li>• Sulfur Lab/demo</li> <li>• Baggie Chemistry</li> </ul> <b><u>Summative:</u></b> <ul style="list-style-type: none"> <li>• Unit Test (see division chair)</li> </ul>
<b>Days/Weeks</b>			
Minimum: 5 days Maximum: 7 days			

### **Oregon Science Standards:**

#### **H.1 Structure and Function:**

**H.1P.2** Describe how different types and strengths of bonds affect the physical and chemical properties of compounds.

#### **H.2 Interaction and Change**

**H.2P.1** Explain how chemical reactions result from the making and breaking of bonds in a process that absorbs or releases energy. Explain how different factors can affect the rate of a chemical reaction.

**H.2P.2** Explain how physical and chemical changes demonstrate the law of conservation of mass.

### **Common Core Standards for Literacy in Science: Reading**

**RST.9-10.3** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

**RST.9-10.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

**RST.9-10.7** Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

Vocabulary and Targets in *italics* are introduced during this unit.

**Critical Content Vocabulary:**

Ion  
Ionic bond  
Covalent bond  
Polar  
Non-polar  
Chemical reaction  
Exothermic  
Endothermic  
Law of conservation of mass  
Coefficient  
Subscript

**Common Core Reading Vocabulary:**

Multistep procedure, experiment, technical task, content specific vocabulary, quantitative information, equation, formats

**Critical Content Learning Targets:**

- I can, by using a periodic table, identify ionically or covalently bonded compounds.
- I can explain the difference between polar and non-polar covalent bonds.
- I can tell the difference between an exothermic and endothermic reaction
- I can identify the different types of chemical reactions.
  - synthesis
  - decomposition
  - combustion
- I can balance chemical equations to show the law of conservation of mass

**Common Core Reading Learning Targets:**

- I can identify the steps necessary when carrying out experiments, taking measurements, or performing technical tasks
- I can precisely follow a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- I can attend (pay attention to) to special cases or exceptions defined in the text when carrying out experiments, taking measurements, or performing technical tasks.
- I can identify symbols, key terms, and words or phrases (e.g., Fe=iron, laser, survival of the fittest) when used in a scientific/technical context.
- I can use various strategies (e.g., context clues, root words, affixes) to determine the meaning of symbols, key terms, and scientific/technical words or phrases in a text.
- I can locate and use resources ( e.g., glossary, footnote, dictionary) to assist me in determining the meaning of unknown symbols, key terms, words and phrases.
- I can identify quantitative or technical information in a text when expressed visually (e.g., tables, charts, graphs), mathematically (e.g., in an equation), and in words

Vocabulary and Targets in *italics* are introduced during this unit.



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|--|---|
|  | <ul style="list-style-type: none"><li>• I can translate quantitative or technical information expressed in words into visual form.</li><li>• I can translate information into words that is expressed visually or mathematically in a text.</li></ul> |
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Vocabulary and Targets in *italics* are introduced during this unit.

## Grade 9 General Science Scope & Sequence

<u>Fifth Unit</u>	Textbook & Materials	Supplements	Assessment Options
Physics	Glencoe: Physical science Chapter 2 (pgs 36-65) Chapter 3 (pgs 66-97) Chapter 4 (pgs 89-123)	Glencoe resource packets for Chapters 2, 3 and 4	<p><b><u>Formative:</u></b></p> <ul style="list-style-type: none"> <li>• Pendulum lab</li> <li>• Acceleration lab</li> <li>• Momentum lab</li> </ul> <p><b><u>Summative:</u></b></p> <ul style="list-style-type: none"> <li>• Car lab</li> <li>• Unit test (see division chair)</li> </ul>
<b>Days/Weeks</b>			
Minimum: 20 days			
Maximum: 22 days			

### **Oregon Science Standards:**

#### **H.2 Interaction and Change**

**H.2P.3** Describe the interactions of energy and matter including the law of conservation of energy.

**H.2P.4** Apply the laws of motion and gravitation to describe the interaction of forces acting on an object and the resultant motion.

#### **Common Core Standards for Literacy in Science: Reading**

**RST.9-10.3** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

**RST.9-10.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

**RST.9-10.5** Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

**RST.9-10.7** Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

Vocabulary and Targets in *italics* are introduced during this unit.

**Critical Content Vocabulary:**

Kinetic energy	acceleration
Potential energy	momentum
Gravitation pot. Energy	gravity
Elastic pot. Energy	force
Chemical pot.	hertz
Radiant energy	wavelength
Amplitude	law of gravitation
Frequency	
Newton's Laws of motion	
Law of conservation of mass	

**Common Core Reading Vocabulary:**

Multistep procedure, experiment, technical task, content specific vocabulary, structure, relationships, quantitative information, equation, formats

**Common Core Writing Vocabulary:**

Credibility, advanced search, plagiarism, paraphrase, authoritative point

**Learning Targets:**

- I can provide examples of each of Newton's Laws of Motion.
- I can distinguish between balanced and unbalanced forces.
- I can compare and contrast kinetic, potential and radiant energy.
- I can define the law of conservation of energy.

**Common Core Reading Learning Targets:**

- I can identify the steps necessary when carrying out experiments, taking measurements, or performing technical tasks
- I can precisely follow a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- I can attend (pay attention to) to special cases or exceptions defined in the text when carrying out experiments, taking measurements, or performing technical tasks.
- I can identify symbols, key terms, and words or phrases (e.g., Fe=iron, laser, survival of the fittest) when used in a scientific/technical context.
- I can use various strategies (e.g., context clues, root words, affixes) to determine the meaning of symbols, key terms, and scientific/technical words or phrases in a text.
- I can locate and use resources ( e.g., glossary, footnote, dictionary) to assist me in determining the meaning of unknown symbols, key terms, words and phrases.
- I can identify key terms and concepts in a text.
- I can analyze the structure of the relationships among key terms and concepts in a text.
- I can explain the relationship among key terms in a text.
- I can identify quantitative or technical information in a text when expressed visually (e.g., tables, charts, graphs), mathematically (e.g., in an equation), and in words
- I can translate quantitative or technical information expressed in words into visual form.
- I can translate information into words that is expressed

Vocabulary and Targets in *italics* are introduced during this unit.

visually or mathematically in a text.

**Common Core Writing Learning Targets:**

- I can define textual evidence (“words for word” support).
- I can determine textual evidence that supports my analysis, reflection, and/or research.

## Grade 9 General Science Scope & Sequence

<u>Sixth Unit</u>	Textbook & Materials	Supplements	Assessment Options
Earth science	None		Formative:  Summative: <ul style="list-style-type: none"> <li>• Unit Test (see Division chair)</li> </ul>
<b>Days/Weeks</b>			
Minimum: 14 days			
Maximum: 16 days			

**Oregon Science Standards:**  
**H.2 Interaction and Change:**  
**H.2E.1** Identify and predict the effect of energy sources, physical forces, and transfer processes that occur in the Earth system. Describe how matter and energy are cycled between system components over time.  
  
**H.2E.2** Explain how Earth’s atmosphere, geosphere, and hydrosphere change over time and at varying rates. Explain techniques used to elucidate the history of events on Earth.

**Common Core Standards for Literacy in Science: Reading**  
**RST.9-10.2** Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.  
**RST.9-10.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.  
**RST.9-10.7** Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

Vocabulary and Targets in *italics* are introduced during this unit.

**Critical Content Vocabulary:**

Fluctuation	radiometric dating	subduction zone
Volcanism	unconformity	transform
Earthquakes	atmosphere	divergent
Glaciation	geosphere	convergent
Tectonic forces	hydrosphere	troposphere
Weathering/erosion	jet stream	stratosphere
Weather phenomenon	deposition	
External energy (sun)	convection	
Water/hydrologic cycle	asthenosphere	
Rock cycle	lithosphere	

**Common Core Reading Vocabulary:**

Central idea, conclusion, depiction, process, phenomenon, concept, summary, multistep procedure, experiment, technical task, quantitative information, equation, formats

**Critical Content Learning Targets:**

- I can identify physical forces that shape the Earth.
- I can identify energy sources that occur in the Earth system.
- I can describe how matter and energy are cycled and transferred through Earth systems.
- I can explain atmospheric events on the Earth.
- I can identify different techniques to date the earth history.

**Common Core Reading Learning Targets:**

- I can define central idea (main point in a piece of writing).
- I can identify symbols, key terms, and words or phrases (e.g., Fe=iron, laser, survival of the fittest) when used in a scientific/technical context.
- I can locate and use resources (e.g., glossary, footnote, dictionary) to assist me in determining the meaning of unknown symbols, key terms, words and phrases.
- I can identify quantitative or technical information in a text when expressed visually (e.g., tables, charts, graphs), mathematically (e.g., in an equation), and in words
- I can translate quantitative or technical information expressed in words into visual form.
- I can translate information into words that is expressed

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<b><u>Seventh Unit</u></b>	<b>Textbook &amp; Materials</b>	<b>Supplements</b>	<b>Assessment Options</b>
Earth Science	None		Formative  Summative Unit test
<b>Days/Weeks</b>			
Minimum: 6 days			
Maximum: 8 days			

**Oregon Science Standards:**

**H.2E.3 Describe how the universe, galaxies, stars, and planets evolve over time.**

**Common Core Standards for Literacy in Science:**

**Vocabulary:**

Asteroid	nebula
Meteoroid	gravity
Comet	speed of light
Black hole	
Red giant	
Super nova	
Galaxy	
Fusion	
White dwarf	

**Learning Targets:**

**I can explain the theory of Earth’s formation.**

**Based upon a star’s size, I can explain it’s life cycle.**

**I can describe the formation of planets.**

Vocabulary and Targets in *italics* are introduced during this unit.