Grade 7 Science Scope & Sequence

First Unit	**Textbook & Materials**	**Supplements**	**Assessment Options**
Motion and Forces **Days/Weeks** Minimum: 20 days Maximum: 27 days	Holt Physical Science Chapter 5 Chapter 6	Physics 4 Kids website: http://www.physics4kids.com/ Rutgers http://www.physics.rutgers.edu/hex_old/visit/lesson/lesson_index.html Middle School Science Physics Page: http://www.middleschoolscience.com/physics.htm Science Channel: Isaac Newton's Laws of Motion: http://science.discovery.com/interactives/literacy/newton/newton.html Videos: Bill Nye Friction Bill Nye Motion Bill Nye Gravity Bill Nye Momentum	**Formative:** • Detecting Acceleration Lab (Physical Science Lab Book – p.647) • Science Friction Lab (Physical Science Lab Book - p. 650) • Relating Mass and Weight Lab(Physical Science Lab Book - p. 651) • A Marshmallow Catapult Lab (Physical Science Lab Book - p. 652) • Inertia-Rama! Lab (Physical Science Lab Book - p. 654) **Summative:** • Friction Inquiry Lab (Physical Science p. 120) • Teacher-created post-assessments • Holt Chapter Tests (chapters 5, 6 – Physical Science)

Oregon Science Standards:

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

7.2P.1 – Identify and describe types of motion and forces and relate forces qualitatively to the laws of motion and gravitation.

8.2 Interaction and Change: Systems interact with other systems.

8.2E.1 – Explain how gravity is the force that keeps objects in the solar system in regular and predictable motion and describe the resulting phenomena. (Explain the interactions that result in Earth's Seasons – 8th grade)

Common Core Standards for Literacy in Science – Reading:

RST.6-8.3 – Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.7 – Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Common Core Standards for Literacy in Science – Writing:

WHST.6-8.1 – Write focused arguments focused on discipline-specific content.

Critical Content Vocabulary:

Motion
Speed
Velocity
Acceleration
Force
Newton
Friction
Gravity
Mass
Action Force
Reaction Force
Net Force
Balanced/Unbalanced Forces
Newton's Laws of Motion
Inertia
F=ma
Momentum

Learning Targets:

- I can describe motion in terms of speed, velocity, and acceleration.
- I can explain the difference between speed and velocity.
- I can identify when acceleration is occurring.
- I can interpret graphs showing motion.
- I can give examples of different forces
- I can calculate the net force on an object and determine if they are balanced or unbalanced.
- I can explain how friction affects motion.
- I can explain the effects of gravity on earth and throughout the universe.
- I can describe the difference between mass and weight.
- I can explain how gravity and air resistance affect falling objects.
- I can identify and describe the four forces of flight.
- I can describe the relative motion of the Earth, Sun, and Moon
- I can explain how gravity makes planets move in orbits.
- I can state and apply Newton's laws of motion.
- I can identify action and reaction forces.

Common Core Reading Vocabulary: Multistep procedure Experiment **Common Core Writing Vocabulary:** Evidence Claim	**Common Core Reading Learning Targets:** • I can identify the steps necessary when carrying out experiments. • I can take measurements. • I can follow a multistep procedure. • I can use graphs, tables, and diagrams to understand information. **Common Core Writing Learning Targets:** • I can support claims with accurate data and evidence. • I can provide a concluding statement or section that follows from and supports the argument presented.

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Second Unit	**Textbook & Materials**	**Supplements**	**Assessment Options**
Energy **Days/Weeks** Minimum: 5 days Maximum: 15 days	Holt Physical Science: Chapter 3, Section 1 Chapter 9 Chapter 10 Holt Earth Science: Chapter 5	Video: • Bill Nye Energy Websites: • U.S. Energy Information Administration http://www.eia.gov/kids/ • NEED – Energy Info Books http://www.need.org/Energy-Infobooks • Rube Goldberg devices http://www.rubegoldberg.com/	**Formative:** • Lab: Energy of Pendulums p.670 • Lab: Feel the Heat p. 672-3 • Lab: Counting Calories p. 675 **Summative:** • Lab: Save the Cube p. 674 • Research/Debate Energy Resources (use NEED website) • Students create own Rube Goldberg device • See disk

Oregon Science Standards:

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

6.1P.2 (Review) - Compare and contrast the characteristic properties of forms of energy.

8.2 Interaction and Change: Systems interact with other systems.

8.2P.2 - Explain how energy is transferred, transformed, and conserved.

7.2 Interaction and Change: The components and processes within a system interact.
7.2E.1 - Describe and evaluate the environmental and societal effects of obtaining, using, and managing waste of renewable and non-renewable resources.

8.1 Structure and Function: Systems and their components function at various levels of complexity.
8.1P.3 (Preview) - Explain how the motion and spacing of particles determines states of matter.

Common Core Standards for Literacy in Science – Reading:
RST.6-8.2 – Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

Common Core Standards for Literacy in Science – Writing:
WHST.6-8.1 – Write arguments focused on discipline-specific content.

Critical Content Vocabulary:	Critical Content Learning Targets:
chemical energy composting conduction convection disposable disposal electrical energy electromagnetic energy environmental effects fossil fuels garbage dumps geothermal heat hydroelectric energy	• I can explain how energy conversions / transformations and how they can make energy useful. • I can explain the law of conservation of energy. • I can give examples of how thermal energy is always a result of energy conversion / transformation. • I can name several energy resources. • I can explain how the sun is the source of most energy on Earth. • I can explain the advantages and disadvantages of using various energy resources. • I can contrast renewable and nonrenewable resources. • I can explain how humans can conserve natural resources. • I can explain how fossil fuels are obtained. • I can identify problems with fossil fuels. • I can describe alternatives to the use of fossil fuels.

incinerating kinetic energy landfill Law of Conservation of Energy limited resources management mechanical energy mining nonrenewable resources nuclear energy radiation recycling renewable resources runoff societal effects solar energy sound energy temperature thermal energy transformations/conversions of energy wave energy wind energy **Common Core Reading Vocabulary:** central idea, summary, opinion **Common Core Writing Vocabulary**: debate, counterclaim, argument, evidence, claim	• I can list advantages and disadvantages of using alternative energy resources. • I can describe how temperature relates to kinetic energy. • I can define heat as a transfer of energy between objects at different temperatures. **Common Core Reading Learning Targets:** • I can compose a summary stating the key information, central idea, or conclusions of the test without adding my own prior knowledge or opinions. **Common Core Writing Learning Targets:** • I can choose a side of the argument and identify reasons that support my choice.

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Third Unit	**Textbook & Materials**	**Supplements**	**Assessment Options**
Weather and Climate **Days/Weeks** Minimum: 20 days Maximum: 27 days	Holt Earth Science: Chapter 15 (The Atmosphere) Chapter 16 (Understanding Weather) Chapter 17 (Climate)	Geography 4 Kids website: http://www.geography4kids.com/ NPR /National Geographic Climate Connections series: http://www.npr.org/news/specials/climate/video/ Teachers' Guide to High Quality Educational Materials on Climate Change and Global Warming http://hdgc.epp.cmu.edu/teachersguide/teachersguide.htm Videos: Bill Nye – Atmosphere Bill Nye - Climate Bill Nye - Earth's Seasons Bill Nye - Water Cycle Bill Nye - Wind	**Formative:** • Water Cycle – What Goes Up… (Earth Science Lab Book – p. 670) • Global Impact (Earth Science Lab Book – p. 700) **Summative:** • Teacher-created summative assessment(s)

Oregon Science Standards:

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

7.2E.2 – Describe the composition of the Earth's atmosphere, how it has changed over time, and implications for the future

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

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

8.1P.3 – Explain how the motion and spacing of particles determines states of matter.

8.2 Interaction and Change: Systems interact with other systems.

8.2E.1 – Explain how gravity is the force that keeps objects in the solar system in regular predictable motion and describe the resulting phenomena. Explain the interactions that result in the Earth's seasons.

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

Common Core Standards for Literacy in Science – Reading:

RST.6-8.9 – Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Common Core Standards for Literacy in Science – Writing:

WHST.6-8.8 – Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Vocabulary:

Atmosphere
Atmospheric layers
Radiation
Conduction
Convection
Greenhouse effect
Global warming / Global climate change
Coriolis effect
Ozone layer
Ice ages
Weather
Climate
Seasons
Axial tilt
Climate Zones
Climatic Evidence (8.2E.4)
Ice core analysis
Climate change
El Niño/La Niña

Learning Targets:

- I can describe the composition of the Earth's atmosphere
- I can describe the layers of atmosphere
- I can explain convection, conduction, and radiation and how they affect the Earth's atmosphere.
- I can explain the relationship between air pressure and wind direction.
- I can describe local and global wind patterns.
- I can explain how water moves through the water cycle.
- I can explain the difference between weather and climate
- I can identify the factors that determine climates
- I can explain how plants and animals interact with the atmosphere.
- I can explain how the greenhouse effect could contribute to global warming.
- I can describe how the Earth's climate has changed over time.
- I can explain how the Earth's tilt causes seasons on Earth
- I can identify why some regions of the earth do not have seasonal changes

Common Core Reading Vocabulary: Data Compare Contrast **Common Core Writing Vocabulary:** Credibility Accuracy	**Common Core Reading Learning Targets:** • I can explain various methods of gathering scientific information. • I can compare and contrast information gained from different sources. **Common Core Writing Learning Targets:** • I can determine the credibility and accuracy of a source by reviewing who wrote it, when it was written, and why it was written.

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Fourth Unit	**Textbook & Materials**	**Supplements**	**Assessment Options**
Cells and Cellular Processes	Holt Life Science: Chapter 3, Section 2 Chapter 4, Section 1-2 Chapter 6, Section 2	Video: Bill Nye Cells Websites: http://sciencespot.net/Pages/classbio.html http://science-class.net/Biology/Biology.htm http://www-bioc.rice.edu/pblclass/6th%20grade/misc/toc.htm http://www.biologycorner.com/worksheets/diffusionlab.html	**Formative:** LabBook: The Perfect Taters Mystery p. 698 LabBook: Stayin' Alive! P. 700 See websites for: Gummy Bear lab Baggie Osmosis lab **Summative:** Holt Chapter Tests Cellular Processes Test (pending)
Days/Weeks Minimum: 5 days Maximum: 10 days			

Oregon Science Standards:

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

7.2L.1- Explain how organelles within a cell perform cellular processes and how cells obtain the raw materials for those processes.

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

Common Core Standards for Literacy in Science-Reading:

RST.6-8.3- Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

RST.6-8.9- Compare and contrast the information gained from experiments, simulations, video or multimedia sources with that gained from reading a text on the same topic.

Critical Content Vocabulary:	**Critical Content Learning Targets:**
Cell wall Cell membrane Chloroplasts Nucleus ribosome mitochondria ATP Photosynthesis Chlorophyll Metabolism Diffusion Osmosis Passive/active transport Endocytosis/exocytosis Respiration Fermentation Glucose Protein synthesis Selectively permeable Stomata **Common Core Reading Vocabulary:** multistep procedure, experiment, technical task, compare, contrast	• I can explain the process of diffusion. • I can describe how osmosis occurs. • I can compare passive transport with active transport. • I can explain how large particles get into and out of cells. • I can describe the relationship between photosynthesis and cellular respiration. • I can compare cellular respiration with fermentation. • I can outline the basic steps in making a protein. **Common Core Reading Learning Targets:** • I can precisely follow a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. • I can compare and contrast information gained from experiments, simulations, video, or multimedia sources with information gained from reading a text on the same topic.

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Fifth Unit	**Textbook & Materials**	**Supplements**	**Assessment Options**
Heredity **Days/Weeks** Minimum: 6 days Maximum: 10 days	Holt Life Science: Chapter 5, Section 1 Chapter 6, Section 1-2	Video: Bill Nye Genes Websites: http://sciencespot.net/Pages/classbio.html http://science-class.net/Biology/Biology.htm http://www.teach-nology.com/teachers/lesson_plans/science/biology/genetics/ http://learn.genetics.utah.edu/content/begin/traits/ http://www-bioc.rice.edu/pblclass/6th%20grade/misc/toc.htm	**Formative:** LabBook: Bug Builders, Inc. p. 702 LabBook: Tracing Traits, p. 704 See websites for: SpongeBob Gen. WS **Summative:** Holt Chapter Tests Genetics Test (pending)

Oregon Science Standards:

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

7.1L.2- Distinguish between inherited and learned traits, explain how inherited traits are passed from generation to generation, and describe the relationships among phenotype, genotype, chromosomes, and genes.

Common Core Standards for Literacy in Science-Reading:

RST.6-8.4- 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 6-8.

Common Core Standards for Literacy in Science- Writing:
WHST.6-8.4- Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Critical Content Vocabulary:	**Critical Content Learning Targets:**
Heredity Dominant trait Recessive trait Genes Alleles Genotype Phenotype Probability Sex cells Sex chromosomes DNA Chromosomes Heterozygous Homozygous Mutation Inherited/learned traits Co-dominant Offspring	• I can explain the difference between inherited and learned traits. • I can explain how genes and alleles are related to genotypes and phenotypes. • I can use the information in a Punnett square. • I can define mutation, and give an example.

Common Core Reading Vocabulary: content specific vocabulary **Common Core Writing Vocabulary:** writing style, purpose, task, audience	**Common Core Reading Learning Targets:** • I can identify symbols, key terms, and words or phrases when used in a scientific/technical context. **Common Core Writing Learning Targets:** • I can use organizational/formatting structures (graphic organizers) to develop my writing ideas.

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Sixth Unit	**Textbook & Materials**	**Supplements**	**Assessment Options**
Reproduction **Days/Weeks** Minimum: 3 days Maximum: 5 days	Holt Life Science: Chapter 2, Section 1 Chapter 5, Section 2 Chapter 11, Section 1-2 Chapter 13, Section 1 Chapter 14, Section 1 Chapter 26, Section 1	Websites: www.ops.org/MIDDLE/MORTON www.middleschoolscience.com/	**Formative:** See website for: Sexual/Asexual Reproduction Foldable Flower Dissection lab **Summative:** Reproduction Test (pending)

Oregon Science Standards:

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

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

Common Core Standards for Literacy in Science- Reading:

RST.6-8.9- Compare and contrast the information gained from experiments, simulations, video or multimedia sources with that gained from reading a text on the same topic.

Common Core Standards for Literacy in Science- Writing:

WHST.6-8.2- Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Critical Content Vocabulary: budding clone diversity fertilization generation regeneration **Common Core Reading Vocabulary:** compare, contrast **Common Core Writing Vocabulary:** organizational structures, formatting structures, transitions, cohesion	**Critical Content Learning Targets:** • I can distinguish between sexual and asexual reproduction. • I can explain the difference between meiosis and mitosis. • I can explain the difference between sexual and asexual reproduction in plants. • I can describe the roles of pollination and fertilization in sexual reproduction. • I can explain that sexual reproduction results in genetic variation of offspring and asexual reproduction results in genetically identical offspring. • I can explain that in both types of reproduction, genetic variation can result from mutation. • I can identify the advantages and disadvantages of sexual and asexual reproduction. **Common Core Reading Learning Targets:** • I can compare and contrast information gained from experiments, simulations, video, or multimedia sources with information 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 information (e.g. well-chosen facts, definitions, details, quotations, examples) to share with my audience.