



LINCOLN-WOODSTOCK COOPERATIVE SCHOOL DISTRICT COURSE SYLLABUS

Course Name: Grade 8 Integrated Science

Semester: Full Year

Teacher: Ms. Steeves

Course Description: This course is a combination of physical, life, and earth science topics along with the general science skills and processes. Through studying these areas, students perform experiments, tests, research, and data collection that strengthen their lab skills, critical thinking and analytical reasoning. Technology is also woven in using measuring tools, computer simulations, building kits & challenges, and computer models. Grade 8 is the final year of the spiral curriculum design for science in middle school.

NGSS Standards Assessed:

Geology

- ESS1-4: geologic time
- ESS2-1: Earth's materials
- ESS2-2: geoprocesses
- ESS2-3: evidence for plate tectonics
- ESS3-1: geoprocesses as applied to human resource use

Humans and the Environment

- PS1-3: natural resources & synthetic materials
- LS2-5: ecosystem services
- ESS3-1: geoprocesses
- ESS3-2: natural hazards
- ESS3-3: human impact
- ESS3-4: human population & sustainability
- ESS3-5: climate change

Ocean, Atmosphere and Climate

- ESS2-5: Earth's systems
- ESS2-6: climate
- ESS3-5: climate change

Heredity & Evolution

- LS1-4: adaptations increase reproductive success
- LS1-5: environmental & genetic factors on growth
- LS3-1: mutations affecting proteins
- LS3-2: asexual vs. sexual reproduction
- LS4-1: evidence for evolution
- LS4-2: evidence for evolutionary anatomy
- LS4-3: evidence for evolutionary embryology



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LS4-4: genetic variability & natural selection

LS4-5: artificial selection

LS4-6: natural selection affects traits

Engineering Design

ETS1-1: criteria, constraints, & limitations of a design

ETS1-2: evaluating designs

ETS1-3: analyze data

ETS1-4: developing models

Cross-cutting Concepts:

1. Patterns.
2. Cause and effect
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter
6. Structure and function
7. Stability and change

Science & Engineering Practices:

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Anchor Texts or Major Curriculum: Some use of *Amplify Science* unit kits & digital resources, Science-saurus; additional materials created & compiled by teacher.

Course Outline (major units of study):

Unit Title	Essential Question or Overarching Understanding
Earth's Systems: Changing Lands	What rocks do we have in NH and why? How does Earth's surface change? <ul style="list-style-type: none">• <i>Cycling of Earth's materials</i>• <i>Evidence for changes over time &</i>



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	<p><i>plate movement</i></p> <ul style="list-style-type: none">• <i>Changing landforms</i>• <i>Drivers of change-sun, water, gravity</i>• <i>Comparison of fossils & rock features</i>• <i>Geologic history of NH & the White Mountains</i>
Earth's Systems: Changing Climate	<p>How has Earth's climate changed over time and how do we know?</p> <ul style="list-style-type: none">• <i>Evidence of past conditions on Earth</i>• <i>Climate vs. weather</i>• <i>Climate change-natural and human-caused</i>• <i>Technology & solutions to mitigate effects</i>• <i>Strategies for personal sustainability</i>
Evolutionary History & Natural Selection	<p>How are organisms related, in the present day and the past?</p> <ul style="list-style-type: none">• <i>Structural changes to genes can be harmful or beneficial</i>• <i>Sexual vs. asexual reproduction in regard to offspring traits</i>• <i>Fossil record & changes in life forms</i>• <i>Anatomical similarities & differences, past & present</i>• <i>Variations of traits in a population, "survival of the fittest"</i>• <i>Genetic variation probabilities</i>• <i>Natural selection in populations and changes in traits over time</i>
Waves and Energy	<p>How do different waves work and how do they transfer energy?</p> <ul style="list-style-type: none">• <i>Basic parts of waves & types</i>• <i>Behavior of different waves</i>• <i>Waves for communication</i>
Engineering Design	<p>What is the question or solution I need an answer for?</p> <ul style="list-style-type: none">• <i>Building challenges that involve limited resources</i>• <i>Prepared and original experiments</i>

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Portrait of a Learner

Independent Learner

I make thoughtful plans and do my best to reach personal goals using feedback to work through challenges.

Responsible Collaborator

I work with others to achieve shared goals by listening actively, contributing ideas, and managing conflict.

Critical Thinker

I analyze information, ask thoughtful questions, and apply reasoning skills to solve problems and make decisions.

Effective Communicator

I express ideas clearly, adapting strategies based on the audience, setting, and/or purpose.

Global Citizen

I show that I care and take responsibility by helping in my community and the world around me.

Additional Classroom Expectations: Additional labs and activities supplied by the teacher and designed by students. Lab Safety protocols to be followed at all times.

Students must participate in lab safety lessons, pass a lab safety quiz, and practice lab safety habits whenever in the science classroom.