

PREDICT CHANGE IN NATURE
Science, Math and Social Science

Grades: 5

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Acceleration Approach

Standard has been accelerated by moving grade level 5 up to the standard used for grade level 8.

1	2	3	4	5	6	7	8	9	CIM	CRLS/ CAM yes
				→						

Organizing Overarching Concept (e.g. systems, patterns of change, models, scales)

Patterns of Change

Organizing Higher Order Skills (e.g. Bloom’s, Paul’s Model of Reasoning)

Paul’s Model of Reasoning:

- Concepts
- Evidence
- Consequences and Implications

Differentiation Features – Students:

- Study a concept in multiple applications
- Use advanced resources
- Make reasoning explicit

COMMON CURRICULUM GOAL

Science - Physical Science—Matter

Understand structure and properties of matter.

Math Measurement —Units and Tools

Understand measurements, attributes of objects and the units, systems and processes of measurement.

Social Science —Geography

Understand and use geographic skills and concepts to interpret contemporary and historical issues

Understand how people and the environment are interrelated.

CONTENT STANDARDS

Science —Physical Science —Matter

Understand structure and properties of matter.

Math Measurement —Units and Tools

Social Science—Geography

Understand how physical characteristics in the environment and changes in the environment affect human activities.

Understand how humans affect the physical environment.

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Archetypal Model

Read and learn about how different variables cause erosion of different land surfaces.

Explain consequences and implications of these changes in the environment. Use Graphic Organizer *Change Model*.

TASK DEMAND

Sample Task Activities

- Given substances such as sandstone, clay, salt, wood, ice etc., students will compare, contrast and predict outcomes of change when these objects are exposed to different forms of nature [e.g., moisture (M), heat (H), pressure (P)]. They will choose appropriate units of measurement.
- Construct a model of a certain geographic area to study erosion, one variable at a time.
- Construct a graph showing change in different geographic areas over time.
- A group discussion will be held of the social implications of different geological areas for humans to live.

Questions to answer in the discussion:

- How has the population of _____ (give the students specific sites, for example; the north side of the Columbia River between Bonneville Dam and Bridge of the Gods, the downtown waterfront of Portland, Mt. St. Helens, Eugene) changed since earliest written history?
- Which factors have contributed to the population changes?
- Which occurred by natural means?

Questions for constructing the product:

1. Which elements erode faster/slower when exposed to moisture (M), heat (H), pressure (P)? Explain and prove.
2. Which combinations of moisture (M), heat (H), pressure (P) lead to faster/slower erosion of elements? Explain and prove.
3. What are the implications of this information when determining building locations?
4. What are the implications of this information when determining natural resource retrieval?

Implementation Time

3 week unit

BENCHMARKS

Science

8th Grade - Compare properties of specific substances.

Social Sciences

8th Grade - Identify economic, cultural, and environmental factors that affect population, and predict how the population would change as a result.

8th Grade - Understand how changes in physical environment affect human activity.

GRADE LEVEL STANDARDS

Math

7th Grade - Determine surface area and volume of three-dimensional block constructions, given two dimensional representation.

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Resources

- Graphing Calculators
- Access to components listed such as sandstone, clay, salt, wood, ice, etc.
- Earth Science Texts
- Earth Science Lesson #33 that follows this lesson has the Archetypal Model: *Students will investigate one variable that affects erosion caused by running water.*
- BPA Northwest Power System Curriculum <http://www.bpa.gov/Corporate/KR/ed/nwpower/standards/OR-8th.htm>
- Access to website STELLA (calculus software):
 - Finding your way around STELLA http://newmedia.doit.wisc.edu/staff/wolf/stella_documents/modes/index.html
 - STELLA at UW-Madison <http://newmedia.doit.wisc.edu/staff/wolf/STELLA.html>

The editor used the internet for many resources listed in this document. The listed books and internet sites should be reviewed and evaluated by the teacher before using.

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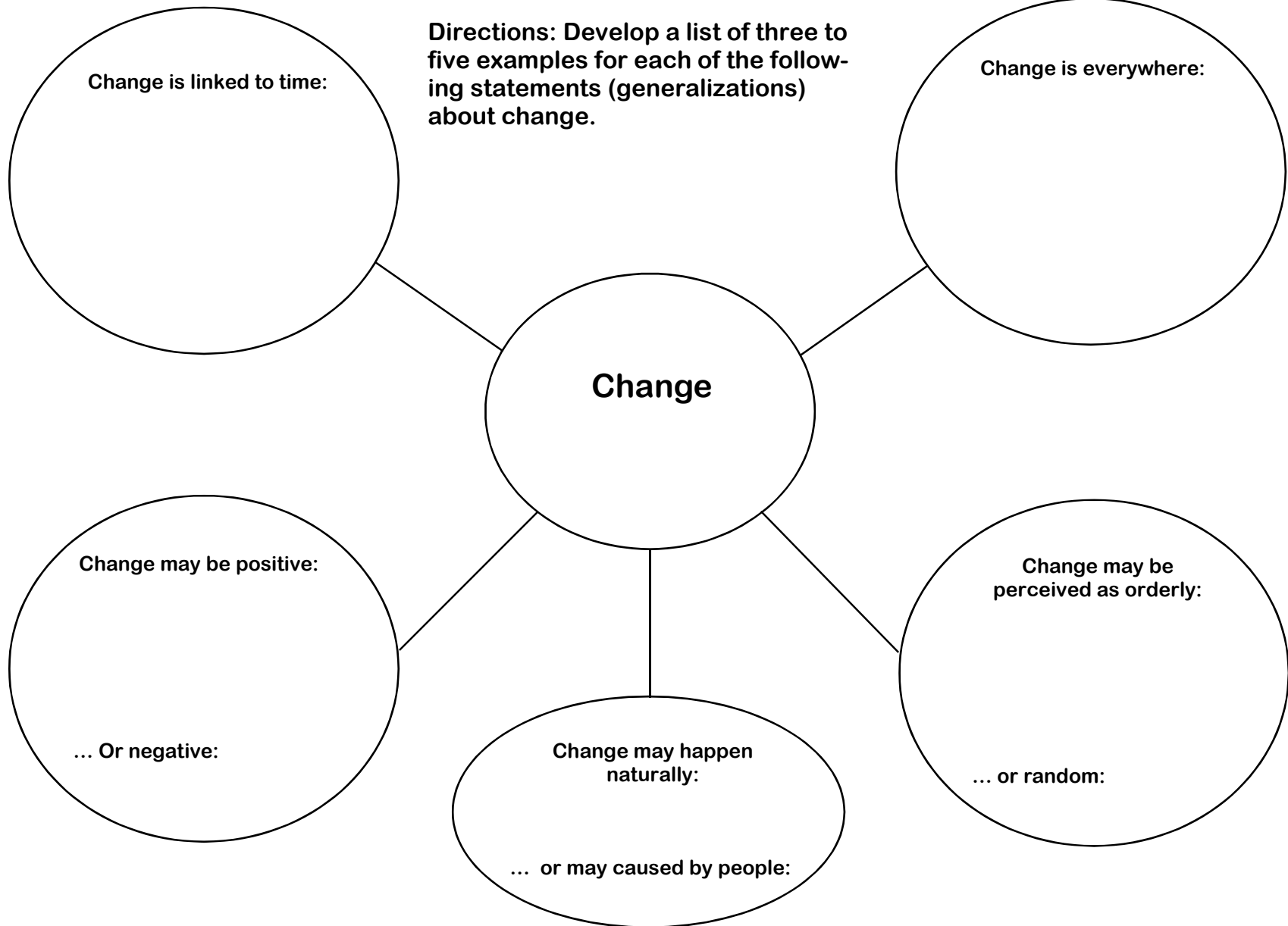
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Science Scoring Guide	6	5	4	3	2	1
Students will be able to:	Exemplary	Proficient	Strong	Developing	Emerging	Beginning
SCIENCE						
Predict and explain which solid components will erode fast/slower under “what” conditions.						
Predict and explain which liquids will erode fast/slower under “what” conditions.						
Predict and explain which gases will erode fast/slower under “what” conditions.						
Graph and explain the rates of erosion of combinations of components versus rates of individual components – and predict consequences and implications for future sustainability of natural resources.						
Predict an increase or decrease in population at different levels of resources availability.						
MATH						
MATH						
Select and use the most appropriate unit to measure surface area and volume.						
Accurately convert measurements to solve problems.						
Accurately explain why all measurements are approximations and why the results of computations with measurements are approximate.						
SOCIAL SCIENCE						
SOCIAL SCIENCE						
Define natural resources.						
Explain economic concepts in regards to scarcity/abundance of natural resources.						
Explain the relationship between the environment (natural resources) and people.						

Graphic Organizer
CHANGE MODEL

Name _____ Date _____



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TAG NEEDS ADDRESSED

INTELLECTUALLY GIFTED	ADVANCED SCIENCE KNOWLEDGE/SKILLS	ACADEMICALLY TALENTED MATH	ADVANCED SOCIAL SCIENCE KNOWLEDGE/SKILLS	CAREER RELATED LEARNING STANDARDS FOR CAM - Certificate of Advanced Mastery	TEACHER CHECKS THE BENCHMARK LEVEL STUDENT IS PURSUING
<input checked="" type="checkbox"/> Advanced Critical Reasoning <input type="checkbox"/> Scholarly Interaction <input checked="" type="checkbox"/> Continuous Progress for Level and Rate* <input type="checkbox"/> Challenging Resources <input type="checkbox"/> Effecting Change <input type="checkbox"/> Decision Making; Ethical Use of Influence <input type="checkbox"/> Leadership Training/Career <input type="checkbox"/> Realistic Goal Setting <input type="checkbox"/> Regular Interaction with Intellectual Peers <input type="checkbox"/> Social-Emotional Issues; Support; Coping Strategies <input type="checkbox"/> Advanced Academic Planning <input type="checkbox"/> Opportunity for Competition/Failures/Successes <input type="checkbox"/> Creative Problem Solving with Real Problems/Audiences <input type="checkbox"/> Pursuit of Advanced Level Research <input type="checkbox"/> Advanced Vocabulary Development	<input type="checkbox"/> Advanced Critical Thinking in Science <input checked="" type="checkbox"/> Continuous Progress/Level and Rate* in Science <input type="checkbox"/> Challenging Science Resources <input type="checkbox"/> Creative Problem Solving Strategies in Science <input type="checkbox"/> Science Advanced Vocabulary Development <input type="checkbox"/> Leadership Training/Career <input type="checkbox"/> Decision Making; Ethical Use of Influence <input type="checkbox"/> Regular Interaction with Talented Science Peer <input type="checkbox"/> Realistic Goal Setting <input type="checkbox"/> Opportunity for Competition/Failures/Successes <input type="checkbox"/> Advanced Academic Planning in Science	<input type="checkbox"/> Advanced Critical Thinking in Math <input checked="" type="checkbox"/> Continuous Progress/Level and Rate* in Math <input checked="" type="checkbox"/> Challenging Math Resources <input type="checkbox"/> Creative Problem Solving Strategies in Math <input type="checkbox"/> Math Advanced Vocabulary Development <input type="checkbox"/> Leadership Training/Career <input type="checkbox"/> Decision Making; Ethical Use of Influence <input type="checkbox"/> Regular Interaction with Talented Math Peers <input type="checkbox"/> Realistic Goal Setting <input type="checkbox"/> Opportunity for Competition/Failures/Successes <input type="checkbox"/> Advanced Academic Planning in Math	<input type="checkbox"/> Advanced Critical Thinking in Soc Science <input checked="" type="checkbox"/> Continuous Progress/Level and Rate* in Soc Science <input type="checkbox"/> Challenging Soc Science Resources <input type="checkbox"/> Creative Problem Solving Strategies in Soc Science <input type="checkbox"/> Soc Science Advanced Vocabulary Development <input type="checkbox"/> Leadership Training/Career <input type="checkbox"/> Decision Making; Ethical Use of Influence <input type="checkbox"/> Regular Interaction with Talented Soc Science Peer <input type="checkbox"/> Realistic Goal Setting <input type="checkbox"/> Opportunity for Competition/Failures/Successes	<input checked="" type="checkbox"/> Personal Management <input checked="" type="checkbox"/> Problem Solving <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Teamwork <input type="checkbox"/> Employment Foundations <input type="checkbox"/> Career Development <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>* Rate requires monitoring to ensure that the student was allowed to move ahead upon acquiring concepts.</p> </div>	<p>Math:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM <p>Science:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM <p>Social Science:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM
<p>Student _____ Grade _____</p> <p>Teacher _____ School _____</p> <p>Date Initiated _____ Date Completed _____</p> <p>Check TAG Identification category:</p> <p><input type="checkbox"/> Intellectual <input type="checkbox"/> Academic Math <input type="checkbox"/> Academic LA</p>					