

EARTH SCIENCE

Science , Math, Social Science and English/Language Arts

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)

- System, patterns of change, models

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

- Bloom's Taxonomy: evaluate, analyze, infer, hypothesize

Differentiation Features - Students

- Assigned fewer tasks to master standard of learning
- Assessed learning to prior to teaching
- Use multiple higher-level skills
- Have additional variables to study
- Use multiple resources
- Study a concept in multiple applications
- Conducts original research
- Make cross-disciplinary applications
- Design and/or construct a model based on principles or criteria

COMMON CURRICULUM GOAL**Science - Earth and Space Science**

Understand physical properties of the Earth, how these properties change, and the Earth's relationship to other celestial bodies.

Science - The Dynamic Earth

Understand changes occurring within the lithosphere, hydrosphere, and atmosphere of the Earth.

Science - Scientific Inquiry

Use interrelated processes to pose questions and investigate the physical and living world.

Forming the Question/Hypothesis

Formulate and express scientific questions or hypotheses to be investigated.

Designing the investigation

Design safe and ethical scientific investigations to address questions or hypotheses.

Collecting and presenting data

Conduct procedures to collect, organize, and display scientific data.

Analyzing and interpreting results

Analyze scientific information to develop and present conclusions.

Math - Interpretation of Data

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Math - Modeling and Change - Use mathematical models to represent and understand quantitative relationships.**Math - Units and Tools** – Understand measurable attributes of objects and the units, systems and processes of measurement.

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Archetypal Model

Students will investigate one variable that affects erosion caused by running water.

TASK DEMAND**Sample Task Activity**

A timeline of major geological events in North America will be developed.

- Students will use an erosion table to investigate how the rate of flow, type of soil, or the slope affects erosion.

Lesson/Unit Progression:

- Students will plan and carry out an investigation on erosion using an erosion table. Students will maintain a journal of their observations and data.
- Students will do background reading in informational texts on earth surface changes.
- Oral presentations will be given supported by appropriate visual aids.

Note: As part of the acceleration, some background information was taught and assessed earlier:

- 8th Grade-**Scientific Inquiry**-Summarize and analyze data including possible sources of error. Explain results and offer reasonable and accurate interpretations and implications.
- 10th Grade-**The Dynamic Earth**-Analyze evidence of ongoing evolution of the Earth's system.
- 10th Grade-**Social Science-History**-Locate and identify places, regions, and geographic features that have played prominent roles in historical or contemporary issues and events.
- 10th Grade-**Social Science-History**-Reconstruct, interpret and represent the chronology of significant events, developments, and narratives from US history.

Guiding Questions:

How did the variable you chose affect the surface?

Knowing you will investigate one variable that affects erosion caused by running water ...

- what scientific questions or hypotheses would you investigate?
- how would you design safe and ethical scientific investigations to address your questions or hypotheses?
- what procedures will you use to collect, organize, and display scientific data?
- how will you analyze scientific information to develop and present conclusions?

Implementation Time

- 2 weeks

Language Arts/English - Writing

Communicate knowledge of a topic, including relevant examples, facts, anecdotes, and details appropriate to the audience and purpose.

Social Science - Geography

Locate major physical and human features of the Earth.

Social Science - Geography

Compare and analyze physical and human characteristics of places and regions.

Social Science - Historical Skills

Interpret and reconstruct chronological relationships.

CONTENT STANDARDS**Science - The Dynamic Earth**

Explain and analyze changes occurring within the lithosphere, hydrosphere, and atmosphere of the Earth.

Science - Scientific Inquiry

Make observations. Formulate and express scientific questions or hypotheses to be investigated based on the observations.

Design scientific investigations to address and explain questions or hypotheses.

Collect, organize and display scientific data.

Analyze scientific information to develop and present conclusions.

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Grades: 5**PAGE 3****Internet Resources**Library of Congress, The Geography and Map Division <http://lcweb.loc.gov/rr/geogmap>U.S. Geological Survey, Earthquake Hazards Program <http://earthquake.usgs.gov>Think Quest Volcanoes Online <http://library.thinkquest.org/17457>Volcanoes from Annenberg/CPB site www.learner.org/exhibits/volcanoes/entry.htmlVolcanoes Around the World www.volcanoes.comVolcano Expedition from the field in Costa Rica www.sio.ucsd.edu/volcano

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.

BENCHMARKS/GRADE LEVEL STANDARDS**Science**5th Grade – Identify causes of Earth’s surface changes.8th Grade – Describe the Earth’s structure and how it changes over time.8th Grade – Summarize and analyze data including possible sources of error. Explain results and offer reasonable and accurate interpretations and implications.**Math – Interpretation of Data**5th Grade – Design investigations to address a question and recognize how data collection methods affect the nature of the data set.7th Grade – Formulate questions and design experiments or surveys to collect relevant data.**Math – Modeling and Units and Tools**5th Grade – Identify or describe a situation which may be modeled by a given graph.7th Grade – Select the most appropriate unit to measure surface area and volume.**Language Arts/English – Writing**5th Grade – Expository: write clear, coherent and focused essays exhibiting awareness of the audience and purpose.5th Grade – Provide supporting evidence.8th Grade – Support theses or conclusions with analogies, paraphrases, quotations, opinions from authorities, comparisons and similar devices.

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Scoring Guide: WRITING Students will be able to:	6 Exemplary	5 Proficient	4 Strong	3 Developing	2 Emerging	1 Beginning
write clear, coherent and focused essays exhibiting awareness of the audience and purpose						
provide supporting evidence,						
support theses or conclusions with analogies, paraphrases, quotations, opinions from authorities, comparisons and similar devices.						

Scoring Guide: MATH Students will be able to:	6 Exemplary	5 Proficient	4 Strong	3 Developing	2 Emerging	1 Beginning
recognize how data collection methods affect the nature of the data set.						
Formulate questions and design experiments or surveys to collect relevant data.						
Evaluate the validity of a study by assessing the characteristics of its design, including the role of randomization and bias prevention in surveys and experiments						
Select the most appropriate tool and unit to measure length, perimeter, weight and capacity.						
Model problem situations with objects and use representations such as graphs, tables and equations to draw conclusions.						
Select the most appropriate unit to measure surface area and volume.						

Social Science - Geography

5th Grade – Locate and identify on maps the continents of the world, the 50 states of the U.S., and major features of Oregon.

5th Grade – Identify physical and human characteristics of regions in the U.S. and the processes that have shaped them.

8th Grade – Locate and identify on maps and globes the regions of the world and their prominent physical features.

8th Grade – Identify and compare physical and human characteristics of major regions and significant places in the world.

10th Grade – Locate and identify places, regions, and geographic features that have played prominent roles in historical contemporary issues and events.

Social Science – Historical Skills

5th Grade – Interpret data and chronological relationships presented in timelines and narratives.

10th Grade – Reconstruct, interpret and represent the chronology of significant events from U. S. history.

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TAG NEEDS ADDRESSED

INTELLECTUALLY GIFTED	ADVANCED SCIENCE KNOWLEDGE/	ACADEMICALLY TALENTED MATH	ACADEMICALLY TALENTED ENG/LA	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 type="checkbox"/> Continuous Progress for Level and Rate* <input checked="" 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 type="checkbox"/> Continuous Progress/ Level and Rate* in Science <input checked="" 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 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 LA <input type="checkbox"/> Continuous Progress/ Level and Rate* in LA <input type="checkbox"/> Challenging LA Resources <input type="checkbox"/> Creative Problem Solving Strategies in LA <input type="checkbox"/> 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 LA Peer <input type="checkbox"/> Realistic Goal Setting <input type="checkbox"/> Opportunity for Competition/Failures/Successes <input type="checkbox"/> Advanced Academic Planning in LA	<input type="checkbox"/> Advanced Critical Thinking in Soc Science <input 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 type="checkbox"/> Advanced Academic Planning in Social Studies	<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	<p>Science:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM
<p>* Rate requires monitoring to ensure that the student was allowed to move ahead upon acquiring concepts.</p>						<p>Math:</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>						<p>English/LA:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM
<p>Social Sci:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM						