

PLANETS

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

- Systems: Student will understand any collection of things that have an influence on one another can be thought of as a system.

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

- Hypothesizing, analyzing, predicting, inferring, evaluating

Differentiation Features – Students:

- Use multiple higher-level skills
- Have additional variables to study
- Make reasoning explicit
- Design and/or construct a model based on principles or criteria
- Present oral and written communication to a real world audience

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

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

Understand the earth's place in the solar system and the universe.

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-Statistics and Probability

Interpretation of Data –Develop and evaluate inferences and predictions that are based on data.

Language Arts/English-Communications

Communicate supported ideas using oral, visual, written, and multi-media forms in ways appropriate to topic, context, audience, and purpose.

PLANETS**Science, Math, and English/Language Arts****Grades: 5****PAGE 2****Archetypal Model**

Read about the movement of one of the planets as it orbits the sun, using textbooks, encyclopedias, and Internet sites.

Design a kinetic model that can show the effect of that planet's movement with relation to the sun and any satellites it has.

Present the model and position the parts to explain celestial phenomenon.

Demonstrate phases of Jupiter's satellites.

TASK DEMAND**Sample Task Activity**

- Have students read about the movement of the Earth and moon as they revolve around the sun.
- Make a model of the sun, Jupiter and its satellites so that their size and distance are to scale. Demonstrate the movement of Jupiter and its satellites around the sun explaining how the revolution and rotation relate to days/years, seasons, solar and lunar eclipses.
- Direct them to create a model that will explain day/night years, seasons, moon phases and eclipses. (Balls on pedestals or held by students.)
- Students will be able to place the individual pieces of their model in the proper position to answer the following questions:

Questions

- How do the planets in our solar system move around the sun?
- How does the movement of the Earth cause us to experience days, seasons, years?
- How does the moon interact with Earth and the sun so that we see phases of the moon?

MOON JOURNAL

- Have students keep a moon journal in which they make moon observations 3-4 times a week. Included in each observation will be a drawing of how the moon appears including the direction in the sky, its height (0° is horizon, 90° is straight up) and the time of the observation.
- After they collect this data, they will analyze it for patterns concerning the moon's phases and the time of day it is visible.
- As part of the journal, they will make a chart or table that shows the moons' phases over a complete cycle. Based on their observations or research (daily newspaper or web site) they will include data on moonrise, also.
- Students will write an expository paper that explains their moon set conclusions citing their observations.

BENCHMARKS/GRADE LEVEL STANDARDS**Science**

5th Grade – Describe the earth's place in the solar system and the patterns of movement of objects within the solar system using pictorial models.

8th Grade – Explain the relationship of the Earth's motion to the day, season, year, phases of the moon, and eclipse.

5th Grade – Collect, organize and summarize data from investigations.

8th Grade – Summarize, analyze and interpret data from investigations.

Math

5th grade – Represent and interpret data using tables, circle graphs, bar graphs, and line graphs or plots (first quadrant).

Language Arts/English-Communication-Speaking

5th Grade – Clarify and support spoken ideas with evidence and examples.

5th Grade – Use descriptive words that clearly convey the message and establish the tone.

5th Grade - Use appropriate technical words that support clear understanding.

8th Grade – Use language effectively and creatively to make a strong impact, evoke a responses from the audience, and convey a clear message.

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Questions

- What is the position of the earth relative to the sun at noon and midnight in Oregon? Demonstrate this.
- What is the position of the Earth and moon, related to the sun, for the following for Oregon:
 - Spring, half moon
 - Summer, half moon
 - Winter, full moon
- If the earth were in this (teacher given) position relative to the sun now, what position would it be in 15 months?

Implementation Time

2 weeks with intermittent journal time.

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.

Resources

- Ask Jeeves <http://www.askjeeves.com>
- International Earth Rotation Service <http://www.iers.org/>
- *Astronomy 161* The Solar System University of Tennessee <http://csep10.phys.utk.edu/astr161/lect/index.html>
- How Stuff Works—Solar Eclipses <http://www.howstuffworks.com/solar-eclipse.htm>
- How Stuff Works—The Seasons Explained <http://www.howstuffworks.com/framed.htm?parent=question165.htm&url=http://www.efni.com/~brentt/tourist/earth2.htm>
- How Stuff Works—Lesson on Seasons <http://www.howstuffworks.com/framed.htm?parent=question165.htm&url=http://www.lalc.k12.ca.us/laep/smart/Sunrise/4-7les4.html>

Scoring Guides See Standards and Assessments Section VII for SPEAKING	6 Exemplary	5 Proficient	4 Strong	3 Developing	2 Emerging	1 Beginning
SCIENCE						
Students will be able to:						
Explain how the Earth’s revolution and rotation relate to days/years						
Explain how the tilt of the Earth’s axis causes seasons.						
Explain the cause of the moon’s phases.						
Explain solar and lunar eclipses.						

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TAG NEEDS ADDRESSED

INTELLECTUALLY GIFTED	ADVANCED SCIENCE KNOWLEDGE/SKILLS	ACADEMICALLY TALENTED MATH	ACADEMICALLY TALENTED ENG/LA	CAREER RELATED LEARNING STANDARDS FOR CAM - Certificate of Advanced Mastery	TEACHER CHECKS THE BENCHMARK LEVEL STUDENT IS PURSUING
<input 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 <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 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 checked="" 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 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 * Rate requires monitoring to ensure that the student was allowed to move ahead upon acquiring concepts.	<p>Science:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM <p>Math:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM <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>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>					