

**SOLAR SYSTEM**  
Science and English/Language Arts

Grades: 2-3

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**Acceleration Approach**

Standard has been accelerated by moving grade level 2-3 up to the standard used for grade level 5.

K	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

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

- Bloom’s Knowledge, comprehension, application, analysis, synthesis and evaluation

**Differentiation Features – Students:**

- Clustered by higher order thinking
- Use multiple resources
- Conduct original research
- Develop a product
- Use advanced resources
- 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 in Space**

Understand the Earth’s place in the solar system and the universe.

**English/Language Arts/Writing**

Write personal fictional narrative, and expository and persuasive compositions.

Use multi-step writing process to express ideas. Communicate knowledge of the topic, including relevant examples, facts, anecdotes and details appropriate to audience and purpose.

Select functional, precise, and descriptive words appropriate to audience and purpose.

**Content Standards**

**Science-Earth in Space**

Explain the relationships among the Earth, sun, moon, and the solar system.

**Benchmarks**

**Science-Earth in Space**

3<sup>rd</sup> Grade – Identify and trace the movement of objects in the sky.

5<sup>th</sup> Grade – Describe the earth’s place in the solar system and the patterns of movement of objects within the solar system using pictorial models.

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#### Archetypal Model

**RAFT** is a model for planning for all ability students. **RAFT** is an acronym for Role, Audience, Format and Topic. (See Graphic Organizer **RAFT**)

In creating this grid:

- consider the skills and content wanted to teach students individually and collectively.
- plan to modify the content, process, or product of a student assignment based on student readiness, learning style, and or interests.
- modify the assignments based on a level that ranges from simple to complex, from concrete to abstract.

In meeting the needs of all learners in a Standards based classroom, the **RAFT** model can be an effective tool to help organize differentiated assignments. The sample will use the model as a means to create an overview of a lesson that integrates either Language Arts and Science. The concept of the **RAFT** organizer has been taken from a Carol Ann Tomlinson workshop.

#### Teacher Planning

- Begin by creating five clusters of students (this number is flexible, you may create as many or as few tiers as needed, based on student readiness.) Five clusters that would likely be found in a regular classroom are: 1) struggling learners, 2) below ability, 3) average ability, 4) academically talented and 5) intellectually gifted.
- Select a theme based on Oregon State Standards. Using a chart based on Bloom's Taxonomy may be helpful in this process.

#### TASK DEMAND

#### Sample Task Activity

Students will learn about the earth's place in the solar system by reading solar system books, seeing a video, viewing resources on the internet and playing kinesthetic games. They will write to demonstrate their knowledge of the solar system.

- Resources and writing assignments will be tiered. Writing choices will be organized in a **RAFT** format.

- High-end learners will find at least one resource online and one in the library to support their writing assignment.
- Students who are talented in reading will create a travel brochure.
- High-end learners will write a persuasive ad for an "Out of this world adventure."
- Accurate facts and data that come from answering the questions below need to be included.
- TAG writing products require students to use higher tiers of Bloom's Taxonomy by asking them to "design" and "create" a product.

#### Questions

##### Solar System Writing Project

- What are the five most important elements of the Solar System? (e.g., sun, planets, satellites, asteroids, moons)
- What are the boundaries of our Solar System?
- What planet is farthest from Earth?
- What planet is closest to Earth?
- What role does gravity play on Earth?
- How do the moon and the Earth interact in the Solar System?
- How can people on Earth tell that the Earth rotates on its axis once every 24 hours?
- How do the Earth and other planets in our Solar System interact with the Sun?

##### Additional Questions for the above average reader (Travel Brochure)

- What descriptions can you use to help make your brochure interesting to the general public?
- What illustrations can you choose to make people want to take a trip in the Solar System?
- What are some ideas or images in your brochure that will make people want to visit your planet?

##### Additional Questions for the high-end learner (Persuasive Ad Campaign)

- How will you persuade the space travel company to choose your adventure ad over another writer's ad?

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- How will you use humor, excitement, and financial savings to make your adventure sound appealing?
- What ideas can you use in the Travel Brochure to persuade your classmates to choose your adventure?

- National Space Science Data Center Photo Gallery [http://nssdc.gsfc.nasa.gov/photo\\_gallery/photogallery.html](http://nssdc.gsfc.nasa.gov/photo_gallery/photogallery.html)
- Magic School Bus: Solar System <http://www.microsoft.com/kids/msb/solarsystem.htm>
- Cole, Joanna. (1992). *The magic school bus lost in the solar system*. Scholastic Trade.

**Implementation Time**

- Five 40-minute work sessions

**Resources**

- ODE Voice Scoring Guide (See Standards and Assessments Section VII.)
- Pine Mountain Observatory <http://pmo-sun.uoregon.edu/>
- NASA Spacelink Our Solar System <http://spacelink.msfc.nasa.gov/Instructional.Materials/Curriculum.Support/Space.Science/Our.Solar.System/>
- NASA "Welcome to the Planets" <http://pds.jpl.nasa.gov/planets/>

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.

Scoring Guide	6 Exemplary	5 Proficient	4 Strong	3 Developing	2 Emerging	1 Beginning
<b>Students will be able to:</b>						
Incorporate correct scientific terminology						
Incorporate correct data for all planets						
Design of product that is well organized and easy to read						
Design of product is creative and interesting						
Select appropriate adjectives to persuade the reader/audience						
Clear and concise oral presentation						

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**RAFT****A model for planning for all ability students.**

**RAFT** is an acronym for Role, Audience, Format and Topic.

In creating a **RAFT** grid: (See Graphic Organizer **RAFT**)

- consider the skills and content we want to teach students individually and collectively.
- plan to modify the content, process, or product of a student assignment based on student readiness, learning style, and or interests.
- modify the assignments based on a level that ranges from simple to complex, from concrete to abstract.

In meeting the needs of all learners in a Standards based classroom, the **RAFT** model can be an effective tool to help organize differentiated assignments. The concept of the **RAFT** organizer has been taken from a Carol Ann Tomlinson workshop.

Begin by creating five clusters of students; this number is flexible, you may create as many or as few tiers as needed, based on student readiness. Five clusters that would likely be found in a regular classroom are: 1) slow learners, 2) LD or ESL, 3) average ability students, 4) academically talented students and 5) intellectually gifted students.

Select a theme based on Oregon State Standards. Collaborate with peers at your grade level. Have Oregon State Standards newspapers on hand as a point of reference. Using a chart based on Bloom's

Taxonomy may be helpful in this process. (See Models and Graphic Organizers Section VI.)

Assignments around a class theme may be developed with the high-end learner expected to work at two to three grade levels above.

**DIFFERENTIATION EXAMPLES**

**Solar System Theme** -Traveling in a space module, you leave Earth headed for Pluto passing other planets.

- **Average students:** Write a sentence, giving an important fact, about Mars, Jupiter, Saturn, Uranus, Neptune, Pluto as you pass on your way.
- **Above average students:** Research the planets that you will pass and fill out the Solar System Comparison Graphic Organizer. (3rd Grade Benchmark is to identify and trace the movement of objects in the sky.)
- **High End Learners:** Research the planets that you will pass and create a visual product that shows the earth in relation to the other planets. (5<sup>th</sup> Grade Benchmark is to describe the earth's place in the solar system and the patterns of movement of objects within the solar system using pictorial models.)

See Solar System **RAFT** on the next page.

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**RAFT Solar System - Grade 3**

<b>Student Profile</b>	<b>Role</b>	<b>Audience</b>	<b>Format</b>	<b>Topic</b>
STRUGGLING LEARNER	Cosmic Tourist	Your Best Friend	Post card from Pluto (Cloze activity)	Write a postcard to your best friend about your trip to Pluto. Fill in the blanks using facts you have learned about the planet Pluto and our Solar System.
BELOW AVERAGE READER	Astronaut	Your Family	E-mail	Send an email to a family member telling them things you have learned, getting ready for your trip to Mars. Include at least four important facts about Mars.
AVERAGE	Astronaut	NASA Supervisor; Captain Spacely	Scientific log entry	Traveling in a space module, you leave Earth headed for Pluto. Write a sentence, giving an important fact, about each planet you pass on your way. (Mars, Jupiter, Saturn, Uranus, Neptune, Pluto).
ABOVE AVERAGE READER	Travel Agent	General Public (Tourists)	Travel Brochure	Select a planet that interests you. Design a travel brochure for people interested in space travel in our Solar System. Use strong vocabulary (adjectives) to describe your planet. Include information about the planet's distance from the Earth and the Sun, as well as size, climate and appearance.
HIGH-END LEARNER	Advertising Agent (Ad Writer)	Client: Space Travel Company	Persuasive Ad (Written and Oral Presentation)	Work with a partner. Create an advertisement for a "out of this world" adventure in our Solar System. Describe the destinations that will be viewed or visited. You must convince the travel company owner that you are the right agency for this job. Your ad must contain accurate facts, as well as being imaginative & exciting.





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**TAG NEEDS ADDRESSED**

INTELLECTUALLY GIFTED	ADVANCED SCIENCE KNOWLEDGE/SKILLS	ACADEMICALLY TALENTED ENG/LA	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 checked="" type="checkbox"/> Creative Problem Solving with Real Problems/Audience <input type="checkbox"/> Pursuit of Advanced Level Research <input type="checkbox"/> Advanced Vocabulary Development	<input checked="" 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 checked="" 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 LA <input checked="" type="checkbox"/> Continuous Progress/Level and Rate* in LA <input type="checkbox"/> Challenging LA Resources <input checked="" 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 checked="" type="checkbox"/> Teamwork <input type="checkbox"/> Employment Foundations <input type="checkbox"/> Career Development	<p><b>Science:</b></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><b>Student</b> _____ <b>Grade</b> _____</p> <p><b>Teacher</b> _____ <b>School</b> _____</p> <p><b>Date Initiated</b> _____ <b>Date Completed</b> _____</p> <p><b>Check TAG Identification category:</b></p> <p style="text-align: center;"> <input type="checkbox"/> Intellectual    <input type="checkbox"/> Academic Math    <input type="checkbox"/> Academic LA         </p>				