Directions:

Students will work on this task independently. The teacher should build in checkpoints for peer and teacher feedback.

Task:

This is a one week long project in which students creatively apply their mathematical knowledge and reasoning skills to solve an interdisciplinary problem: Explaining mathematically the vertical motion of planets in the solar system. Students will practice using computational, technological, and communication skills in this project.

Project Description:

This three-step project requires to students to solve quadratic equations in one variable and graph quadratic functions for the purpose of gaining an understanding of vertical motion.

The purpose of this project is to provide students with opportunities apply mathematical reasoning and computation skills in novel ways to create meaning about the world around them.

This project also allows for students to build their capacity to use technology, to create mathematical rules, and to use communication skills in sharing their work with their classmates.

The following question will guide student work:

How can vertical motion of the solar system be explained mathematically?





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LEARNING GOALS

Learning Objectives

- 1. Students will be able to solve mathematical equations through computational and reasoning skills.
- 2. Students will be able to use technology to solve mathematical equations.
- 3. Students will be able to practice using the listening and speaking skills with their classmates in small groups.

Content and Skills

- Calculate gravity
- Write the equation of the vertical motion (quadratic equation)
- Recognize maximum point of the parabola
- Learn how to solve quadratic equations
- Recognize the axis of symmetry in order to find the x-intercepts

Standards and 21st Century Skills Learned

- A-REI Solve quadratic equations in one variable
- F-IF.7 Graph quadratic functions
- CCSS Mathematical Practices # 2: Reason abstractly and quantitatively
- 21st Century Standard: 6.A.2 Use technology (computer, PDA's, media players, GPA's, etc.) communication/networking tools and social networks appropriate to access, manage, integrate, evaluate and create information to successfully function in a knowledge economy.





Process/Timeframe:

Due dates, check-in points, a timeline of the expected process.

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	 Teacher introduces project Out of this World. Teacher will explain the project. 	 Students will work on both Activities 1 and 2. 	 Students finish Activity 2. Students will work on Activity 3. 	 Students will finish Activity 3. Students research basketball / other sports rules. Students write basketball rules in any of the 8 planets. 	 Students share their findings with one another in small groups. Students hand in their projects typed.

Materials and Resources Needed:

- $Ax^2 + Bx + C$ quadratic equation in standard form.
- Internet for research basketball rules.

<u>Grading</u>: How will the student be graded? How will the check-in points be assessed?

Out of this World Rubric



