1. What is our purpose?
To inquire into the following:
- **transdisciplinary theme**

**How the World Works:** An inquiry into the natural world and its laws; the interaction between the natural world and human societies, how humans use their understanding of scientific principles; the impact of scientific and technological advances on society and the environment.

- **central idea**

Man’s innate curiosity has driven his desire to understand Earth and its relationship to other planets in the solar system.

**Summative assessment task(s):**

What are the possible ways of assessing students’ understanding of the central idea? What evidence, including student-initiated actions, will we look for?

Using the research findings of the class, students will complete together as a class, a “Visitor’s Guide to Space”. Key information for their guide will include: the composition of the sun as a star that provides light and heat energy, the names and histories of the planets in the solar system and their positions in relation to the sun, the characteristics of the planets. Students will have the option to work in teams or individually to construct models of the planets and the moons to showcase their research.

Additional information relating to space technology will be reported. This will include the machines that have enhanced our understanding of the solar system and biographical information about scientists whose impact on science has expanded our space knowledge.

Children will be encouraged to create dramatic readings related to the mythological characters for whom the planets were named. This inspiration of expression may also include the performance of any poetry, music, or dance.

2. What do we want to learn?

What are the key concepts (form, function, causation, change, connection, perspective, responsibility, reflection) to be emphasized within this inquiry?

- Connection, Causation, Function

**Related Concepts:** system, organization, discovery

What lines of inquiry will define the scope of the inquiry into the central idea?

The dynamics of planets, moons, stars, and the importance of gravity

The earth’s movement relative to the sun and other planets

Movement of the phases of the moon

Biographical information on scientists

Machines that explore space to provide information about the solar system

What teacher questions/provocations will drive these inquiries:

Children will brainstorm their own inquiries, but in addition:

- What makes Earth unique? What sets it apart from the other planets?
- How does gravity effect the planets?
- What are the names of honored space scientists?
- What machines did man create to explore outer space?
- How did early people regard the phenomena of Earth’s changes?
- What stories did they create to explain these phenomena?
3. How might we know what we have learned?

This column should be used in conjunction with “How best might we learn?”
What are the possible ways of assessing students’ prior knowledge and skills? What evidence will we look for?
Students will discuss the lines of inquiry in groups or in a whole-class setting to determine prior information which will be recorded on chart paper.
Discuss what children already know about the components of the solar system. Discuss why Man is so curious to know about the world outside of Earth.

What are the possible ways of assessing student learning in the context of the lines of inquiry? What evidence will we look for?
Students will discuss the lines of inquiry in groups or in a whole-class setting to determine prior information which will be recorded on chart paper.

As students read independently and share their readings, they will revisit inquiry questions and record findings.

Students will provide a drawing that sequences the moon phases that explain its changing appearance.

Teachers will use anecdotal records to record students’ understanding of the concepts of size, order, and distance of the planets.

Children will write a paragraph explaining why the planets maintain their orbits.

Children will list the machines man has created that bear scientists name (Hubble, Galileo, etc.)

4. How best might we learn? What are the learning experiences suggested by the teacher and/or students to encourage the students to engage with the inquiries and address the driving questions?

During independent reading and shared reading, students and teacher will read a variety of library books related to the solar system.

Students will observe the moon for 28 days and create a “Moon Journal”. Students will share and discuss findings to deepen understanding of the phases. Alternatively, a class journal can be created.

In collaborative groups, students will compare/contrast selected planets. Focus will be on distance, length of day, moons and rings of planets, surface properties and atmosphere. Alternatively, children will independently choose a planet and write descriptive paragraphs including the above information along with five facts about the planets. They can include fantasy activities to “advertise” the planet in their Guide to Space.

Create a poster listing the advantages of living on Earth, describing the resources available, the seasons, behavior (migration, hibernation).

Children will read various myths to determine how the planets got their names, and make a report to share.

Given the vast information children have acquired, they can create their own planet with a name, properties, and available activities.

Children can choose a famous space scientist and share information in autobiographical format.

Children will research early space research throughout the ages. What opportunities will occur for transdisciplinary skills development and for the development of the attributes of the learner profile?

Transdisciplinary Skills - Research skills, self-management skills (See above activities above.)

Learning Profile: inquirer, thinker, knowledgeable through the activities listed above

5. What resources need to be gathered?

Trade books by Seymour Simon  Mars, Venus, Earth, Mercury, Jupiter, Saturn, Uranus,

Computers for research in the classroom, solarsystem.nasa.gov/kids, United Streaming.org, Google Earth, National Geographic, Planets for Kids.org, Kids.Nineplanets.org, StarChild.com

Nonfiction literature containing information about planets and scientists, materials for developing planet models, reproduction of photos from Hubble, under the direction of the art teacher may be obtained from the computer. Using Kidrex.org or StarChild@starchild.gsfc.nasa.gov websites children may research the following scientists who have telescopes/probes named for them: Nicolaus Copernicus, Galileo, Ulysses, Magellan, Cassini, Huygens, Herschel, Spitzer, famous women astronauts and astronomers.

Work area for research, creating, and producing materials, t.v. for video viewing, access to computers for research.

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6. To what extent did we achieve our purpose?

Assess the outcome of the inquiry by providing evidence of students’ understanding of the central idea. The reflections of all teachers involved in the planning and teaching of the inquiry should be included. Student learning was evident from the research and completion of the projects. Students learned the various properties of the planets as rocky and gas planets as well as the different gods for whom the planets were named. They learned about the various machines—telescopes, probes—that humans have created to further knowledge of the solar system. They used their creativity to imagine unknown plants and describe properties based on those of existing ones.

How you could improve on the assessment task(s) so that you would have a more accurate picture of each student’s understanding of the central idea.

We think it is important to encourage children to use their imaginations in their presentations. Children should not have to be confined to a teacher-directed outcome, and we’ll continue to let them decide what they want to create to demonstrate their knowledge.

What was the evidence that connections were made between the central idea and the transdisciplinary theme?

Through the research students learned that there is a connection between the existence of humans and their natural world. They developed an understanding of scientific investigation through the research.

7. To what extent did we include the elements of the PYP?

What were the learning experiences that enabled students to:
● develop an understanding of the concepts identified in “What do we want to learn?”
  Function: Students learned how the components of the solar system work through reading and sharing information about the technology and machines that were created for discovery.
  Organization: Students learned how the planets and other satellites have a specific order in space;
  Discovery: This unit demonstrated that man’s curiosity has had a major impact on furthering our knowledge about space and our earth.
● demonstrate the learning and application of particular transdisciplinary skills?
  This unit gave the students an opportunity to use research skills to find the answers to many of their inquiries. They were able to use this information to create their projects.
● develop particular attributes of the learner profile and/or attitudes?
  In each case explain your position.
  The students grew as thinkers and inquirers. At the beginning of the unit they asked basic questions but dug deeper to learn more about the dynamics of the universe. They communicated through writing and discussion and curiosity was evident as they researched information. They were mostly engaged in their projects, enjoyed their presentations, and seemed excited about participating. As always, there were some who had difficulty keeping on task.
Reflecting on the inquiry

8. What student-initiated inquiries arose from the learning?

Record a range of student-initiated inquiries and student questions and highlight any that were incorporated into the teaching and learning.

How did the planets form?
How old is the sun?
What do you call scientists who study space and make machines?
How do planets stay in orbit?
What happens if a planet spins off its orbit?
How many years does it take to make a telescope?
Will scientists prove that there was life on Mars?
If Earth moves close to the sun, will it burn up fast or slow?
If we found a new planet, could we name it Spirits of Fire?
How are craters formed?

At this point teachers should go back to box 2 “What do we want to learn?” and highlight the teacher questions/provocations that were most effective in driving the inquiries.

What student-initiated actions arose from the learning?

Record student-initiated actions taken by individuals or groups showing their ability to reflect, to choose and to act.

Some students took the initiative to do more research on their space topics at home, then shared the information at school.
Students researched myths and gods that are related to the planets.

9. Teacher notes

The students were engaged from the beginning since the planets pique the interest of young children. The projects worked well with the reading program since there were many book available from the district to use for research. This supported students with the process of non-fiction writing. Students were inquirers and learned how to research a topic on the internet as well as locate information in nonfiction texts.

Future Actions
Donate more time for the unit so children can do more of the work during class time
Coordinate a field trip to the Planetarium, depending on the program being offered
Allow for creative art reinforcement since our time is limited by the constraints of the state test schedule
Use newspaper or scientific journals to show children the advances in space information