My Place in Space: Unit Roadmap **May 2015**

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First Grade

My Place in Space: An 'out of this world' investigation of Earth's place in space and exploration of pattern of movement in the sky. Particular emphasis is placed on the relationships between the Sun/Earth/Moon.

Timeline: 10 lessons (30-40 minutes in duration)

Goals: While 'traveling' through space students will gain an understanding of Earth's place in the universe while actively observing, describing, and predicting some patterns of movement of objects in the sky.

Essential Questions to Consider: What objects are in the sky and how do they appear to move? What patterns can now be predicted based on my new understandings? What is the relationship between the Sun/Earth/Moon?

Objectives: See end of document for NGSS and NH Curriculum Framework standards.

Students will be able to understand that:

- ***the features of the day and night sky are different.***
- ***night and day are caused by the Earth's rotation …the regular and predictable motions of the Earth and Moon explain day and night.***
- ***the Sun is a source of light and heat for Earth and is necessary for life.***
- ***the Sun is a star…a big ball of gas.***
- ***the Sun is at the center of the solar system and does not move.***
- ***there are predictable cycles in our system.***
- ***the sun and moon appear to rise in one part of the sky, move across the sky, and set.***
- ***there are too many stars to count and they are unequal in their brightness.***
- ***there are other planets in our solar system.***
- ***the Moon orbits the Earth.***

- *the Earth is a part of a solar system, made up of distinct parts, one of a number of planets that orbit the Sun.*

Students will be able to:

- *use observations of the sun, moon, and stars to describe patterns that can be predicted.*
- *make observations at different times of year to relate the amount of daylight to the time of year.*
- *recognize the basic patterns of the Sun, including its appearance during the daytime, and how its position in the sky changes through the seasons*
- *recognize the basic patterns of the Moon, including its appearance sometimes at night and sometimes during the day; and how it appears to change shape through the month.*
- *recognize that the light and heat the Sun provides to the Earth is necessary for life.*
- *compare and identify the features of the day and the night sky.*
- *demonstrate that the Earth rotates approximately once every 24 hours.*
- *realize that the Sun and the Moon appear to rise and set (change position across the sky).*
- *illustrate changes in the Moon's appearance (patterns over time), and document its phases (through observation).*
- *demonstrate understanding of what it means to revolve, rotate, and orbit.*
- *model how the Earth rotates as it moves around the Sun and how the Moon movers around the Earth.*
- *explain the Earth's place in the solar system.*
- *recognize that as the position of the Sun changes in relation to the Earth it creates shadows of varying length and direction.*
- *predict, compare, analyze, and discover as SCIENTISTS.*
- *investigate things that interest them about space.*
- *ask effective questions to further their individual understandings.*

Assessment:

Formative assessment is central to my practice and will be used throughout the unit and lessons. Students will be asked to self-assess understandings at the beginning of the unit and later record growth on a rubric. The unit will begin with the children illustrating and articulating something they think they either know or wonder about the Earth/Sun/Moon. The unit will conclude with a performance assessment in which the students will be able to display their learning to the other first grade classrooms in the school. I am acquiring a giant 'space ship' made from a refrigerator box at the end of the year. In the coming years, we will be training throughout the unit for our trip to space in our class space ship. This will involve physical and mental preparation. The children will act as tour guides and be presenting information to their peers. The performance may involve NASA video and photography to simulate real space travel.

Activities: The unit will be integrated throughout all subject areas.

1. **Goal setting for unit (SUN/MOON/EARTH) and previewing content: Pose questions to the children and have them record answers on first 'graffiti wall'-What do we already think we know about our place in space? Children will think about questions such as, "What is the solar system? How does the sun produce light and heat?," etc. After discussing and recording thoughts, we will embark on a second 'graffiti wall'-What questions do I have? What do I want to learn? We will gather to discuss goals for the unit and children will self-assess levels of understanding on class rubric. 'Space Rap' will be introduced and performed at the start of each science period.**
2. **My Place in Space: Read text and discuss terms. Photographs will be shown and disseminated to children. The children will make 'zooming out' books. We will zoom out from our school all the way to the Milky Way. The lesson will focus on perspective and set foundational understandings. This activity will serve as a meaningful hook for such a grand idea.**

3. **Earth: With a clearer idea and understanding of the unit, children will have an opportunity to discuss what makes our Earth special and why we need to care for it. An art project will be explained and children will make a beautiful coffee filter Earth in space. Upon completion, the Earth projects will be displayed and children's 'universal' address written.**

4. **SUN and Earth's relationship to Sun: Three sessions will be spent exploring and investigating the Sun. After introductory nonfiction text and song, Lisa and Van Purcell will come and present Four Winds lessons/activities. A puppet show will be given to help the children discover why the sun is important to living things on Earth. An activity will focus on the rotation of the Earth and the patterns/reasons for nighttime and daytime (flashlight/globe). We will explore and investigate what kinds of materials allow light to pass through and investigate shadows. Outdoor exploration will include size of the sun in relation to Earth (yellow balloon/peppercorn), shadow drawings, heat investigations, and a measurement activity to show the distance of the Earth from the sun. Michael Caduto's performances will also feed into these investigations.**

5. **EARTH/SUN/MOON relationships: Songs and movement will be presented to teach vocabulary such as orbit, rotate, and revolve. Children will understand the earth moves around the sun and the moon moves around the earth. Students will work on a model of these relationships.**

6. **MOON: Phases (demonstration with flashlight, etc.), models, videos of first lunar landings shown. Children create books about phases of the moon. An activity to demonstrate craters is planned. Throughout the unit, moon journals are worked on and shared at Morning Meeting. Students begin to make observations and describe patterns that can be predicted.**

7. **<u>Stars and Stories</u>: Guest teacher Michael Caduto will come to present myths and legends about the night sky and teach the children about constellations. Children learn songs about the night and work on constellation art project.**

8. **<u>Science Centers:</u> Throughout the unit, eight independent science centers will be set up for investigation and exploration. Centers include:**
    - **Earth and Sun**
    - **Up in the Sky**
    - **Different Seasons**
    - **Making Shadows**
    - **Cloud Shapes**
    - **Day and Night**
    - **Our Helpful Sun**
    - **Rocket Ship**

9. **<u>Writing</u>: Throughout the unit we will contribute to a class book called *Our Journey Through Space.* We will respond to what to what we are learning and write interactively about our experiences.**

    <u>Touchstone experience</u>: Traveling planetarium or star-gazing evening. Students will have an opportunity to celebrate and reflect on their learning. Graffiti walls will be revisited and we will design another asking what we still question.

Supporting Resources:
As stated earlier, this unit will be integrated into all areas of the day. Read-alouds will consist of rich nonfiction text, as well as myths and fiction. Songs will be sung daily and children will complete many art projects. Children will paint the solar system and the sun and moon. Children are naturally curious about space, so ample time will be devoted to talking about and researching planets, what it means to travel in space, gravity, etc. This year, I was able to purchase a plethora of rich nonfiction texts from grant funding.

NGSS: First Grade

1.Space Systems: Patterns and Cycles
Space Systems:
Patterns and Cycles
Students who demonstrate understanding can:
1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.
1-ESS1-2.Make observations at different times of year to relate the amount of daylight to the time of year.

New Hampshire Curriculum Framework
Science
Earth Space Science
ESS2– The Earth is part of a solar system, made up of distinct parts, which have temporal and spatial interrelationships.

1. EARTH, SUN, AND MOON
S:ESS2:2:1.1 Recognize the basic patterns of the Sun, including its appearance during the daytime, and how its position in the sky changes through the seasons.
S:ESS2:2:1.2 Recognize the basic patterns of the Moon, including its appearance sometimes at night and sometimes during the day; and how it appears to change shape through the month.

2. ENERGY
S:ESS2:2:2.1 Recognize that the light and heat the Sun provides to the Earth is necessary for life.

4. VIEW FROM EARTH
S:ESS2:2:4.1 Recognize that the Sun, Moon and stars all appear to move slowly across the sky.
S:ESS2:2:4.2 Recognize that as the position of the Sun changes in relation to the Earth it creates shadows of varying length and direction.
S:ESS2:2:4.3 Explain that people should not look directly at the Sun because it is dangerous and may cause injury to the eyes.