ITQ ARTS AND SCIENCE INTEGRATION
GRADE 3
DANCE AND EARTH SCIENCE

The Moon and the Earth Go Round and Round
Lesson #3

FOSS California, Grade 3, *Sun, Moon, and Stars*, "The Moon", Investigation 2 and 3

CONTENT STANDARDS

Dance Grade 3

5.1 Explain relationships between dance elements and other subjects (e.g., spatial pathways – maps and grids; geometric shapes and body shapes.)

Earth Science Grade 3

ES4d Students know that the Earth is one of several planets that orbit the Sun and that the Moon orbits the Earth.

ESSENTIAL QUESTIONS *(Questions students might ask about the topic)*

- How do the Earth and the Moon move around the Sun?
- How does dance help me understand how the Earth and the Moon move around the Sun?

OBJECTIVES & STUDENT OUTCOMES *(Students will be able to…..)*

- create moving shapes and locomotor movement to depict rotation and orbit of the Earth, and Moon (with its phases), around the Sun.

ASSESSMENT (*Various strategies to evaluate effectiveness of instruction and student learning)*

- **Feedback for Teacher**
  - Student performance
  - Student answers to inquiry
- **Feedback for Student**
  - Teacher feedback
  - Peer feedback

WORDS TO KNOW

Dance

- **Locomotor Movement:** Movement that takes the body from point A to point B: walk, run, hop, skip, gallop, slide, leap, roll, crawl, jump, etc.
- **Pathway:** The path on which the body or a body part travels in curved or straight lines.
- **Shape:** A position of the body in space. A shape can be still or moving.

Science

- **Lunar Cycle:** The 4-week period during which the Moon orbits Earth one time and all of its phases are visible from Earth.
- **Moon:** Earth's natural satellite.
- **Orbit:** To move or travel around an objected in a curved path. Earth orbits the Sun. The Moon orbits the Earth.

MATERIALS

- Music:
  - *Planet Drum*, by Mickey Hart, Track 6, "The Hunt"
  - Making Music CD Grade 3, *The Power of Performance*, Track 32 "Big Beautiful Planet" and Track

34 “The Song of the Night”, Silver Burdett
- Science notebooks (1/student)

RESOURCES

- *FOSS California,* Grade 3, *Sun, Moon, and Stars*, “The Moon”, Investigation 2 and 3

PREPARATION

- Review lesson #2, rotation of the Moon around the Earth and phases of the Moon.
- Post pictures of the Lunar Cycle.
- Have teacher sheets, numbers 9-12 (Investigation 2), and page 176 ready to place on overhead.

WARM UP *(Engage students, access prior learning, review, hook or activity to focus the student for learning)*

(5 minutes)

- *Say: Today, we are going to learn more about the solar system. Before we do that, let’s review what we learned about the Earth, **Moon**, and Sun. Everything in the universe moves.*
- *Ask:*
  - *How does the Earth move?* [The Earth rotates on its axis]. Have students perform the hand gesture and dance steps.
  - *How does the **Moon** move?* [The **Moon orbits** counterclockwise around the Earth.]
    - Arrange students in pairs. Partner A stands and rotates around an axis representing the Earth, and partner B representing the Moon will **orbit** (revolve) the Earth. Both should move counterclockwise. Perform for 10 seconds. Have students sit.
  - *Where does the **Moon** get its light?* [From the Sun.]
  - *How does the **Moon** change its shape over a month?* [The **Moon** changes its appearance in a predictable cycle from the invisible new **Moon**, to the full **Moon**, and back to a new **Moon**.]
  - *What is the difference between a waxing and a waning **Moon**?* [Repeat chant from lesson #2]. The light of the waxing **Moon** appears to get bigger each day until it is a full **Moon**. The light of the waning **Moon** appears to get smaller each day until it becomes a fully shadowed new **Moon**.

MODELING *(Presentation of new material, demonstration of the process, direct instruction)*

(25 minutes)

The Earth’s **Orbit** – The Birthday Dance (5 minutes)

- *Say: Last week we learned that the **Moon orbits** the Earth in a counterclockwise direction. But did you know that the Earth **orbits** something too? Do you know what the Earth **orbits**?*
  - Pair share ideas for 10 seconds and share responses.
- *Say: The Earth **orbits** the Sun. I have stood here on Earth and been around the Sun more times than you have. You have stood here on Earth and been around the Sun more times than a first grader.*
- *Ask: Can you guess how many times you have stood on the Earth and **orbited** around the Sun?* [Accept student responses].
- *Say: Each time the Earth makes a full **orbit** (revolution) around the Sun, I will have a birthday. If I am eight years old, how many **orbits** around the Sun did I make?* [Eight]
  - Select one volunteer. The teacher will be the Sun, the student will be the Earth that will **orbit** (revolve around) the Sun.
  - *Say:* (to the student representing the Earth) *pick a place where you will begin. Note: you may also have the student begin on a north, south, east or west wall or starting facing a particular object, such as a window, door or clock).*
  - *Each time you **orbit** (revolve) and return to your starting place, you will have a birthday and say how old you are (e.g., **orbit** (revolution) one, “I am one”; **orbit** (revolution) two, “I am two”, etc.).*
  - *You will skip in as many **orbits** (revolutions) that are equal to your age. I will be the Sun and will do an axial movement that resembles the Sun shining.*
  - Student performs the number of **orbits** (revolutions) that equal his/her age.
- Have the class stand and arrange in partners. One student will be the Sun, the other will be the Earth. Repeat the exercise. Switch and repeat one more time.

Review **Lunar Cycle** and Phases of the **Moon** (10 minutes)

- As a large group, review all eight phases of the **Moon** beginning with the new **Moon.** Use the call and response chant as students work through each phase.
- Practice several times having students move smoothly through the phases. The motion should look fluid and continuous, but each shape can still be identified.
- *Say: You will have 8 **beats** to move through all eight phases. Each phase will take one **beat**.*
  - *You will start in the new **Moon** phase **shape**.*
  - *Take one **beat** to move to waxing crescent (**beat** 1)*
  - *Take one **beat** to move to first quarter (**beat** 2)*
  - *Take one **beat** to make to waxing gibbous (**beat** 3)*
  - *Take one **beat** to move to full **Moon** (**beat** 4)*
  - *Take one **beat** to move to waning gibbous (**beat** 5)*
  - *Take two **beats** to move to second quarter (**beat** 6)*
  - *Take two **beats** to move to Waning crescent (**beat** 7)*
  - *Take two **beats** to move to new **Moon** (**beat** 8)*
  - *You should be in the full **Moon shape** on **beat** 4 and back to the new **Moon** on **beat** 8. So, make sure you move your arms slowly and shuffle your feet quickly from new **Moon** back to new **Moon**.*
- Students will shuffle their feet in a quick pace as they move their arms through the eight arm positions. Practice several more times.
- Have students practice the shapes while walking in a counterclockwise circular pathway. (Note: Make certain the students are not spinning in place. If necessary, place a piece of paper or some other object on the floor and have the student make a circle around that object.) Practice several times.

The **Earth and Moon Orbit** Dance (10 minutes)

- Select twp volunteers. One student will represent the Sun, you, the teacher will represent the **Moon**, and one student will represent the Earth.
  - The student as the Sun will remain stationary in the center of the space and perform an axial movement to show the sun shining.
  - The Earth will perform the double basic step (step touch, or you may simply have this student walk slowly), rotating their arm as they revolve counterclockwise around the Sun.
  - The **Moon** will **orbit** counterclockwise around the Earth for 8 **beats** while walking and making the **Lunar Cycle** shapes with the arms.
  - *Say:*
    - *First, let's see the Sun shining (student one will do axial movement).*
      - Have students say, "The Sun is shining".
    - *Next, let's see the Earth revolving around the Sun (student two will do step-touch or slow walk) while rotating arm).*
      - Have students say, "The Earth revolves around the Sun".
    - *Last, let's have the **Moon orbit** the Earth as the Earth is revolving around the Sun.*
      - Have the students say, "The **Moon orbits** the Earth and the Earth revolves around the Sun.
      - Demonstrate the Moon changing shape as it **orbits** around the Earth.
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GUIDED PRACTICE *(Application of knowledge, problem solving, corrective feedback)*
(15 minutes)

- Arrange students in groups of three. Predetermine who will be the Sun, **Moon**, and Earth, or allow students 30 seconds to choose their role.
- *Say: In groups of three, you will create the Earth and **Moon** dance.*
- *Remember these three things* (you may want to post these points):
  1. *The Sun will be in the center shining*
  2. *The Earth will **orbit** the Sun slowly while doing the step touch and hand gesture*
  3. *The **Moon** will **orbit** the Earth counterclockwise while doing the arm gestures for the eight phases of the **Lunar Cycle**. Remember to take 16 **beats** to make a full **orbit**.*
- Allow groups five minutes to explore. Move from group to group and assist where needed. Encourage

students to make appropriate choices in level, size, speed, direction, pathway, etc.

- Option: Videotape each group in process.
- Select three groups who grasp the understanding of both the science and dance concepts to perform for the class.
- Arrange the three groups in a row and have each group perform, one at a time, in succession then freeze.
- Videotape if desired.
- *Ask* the audience*:*
  - *How many **lunar cycles** did you see in the last demonstration?* [Three]
  - *How many months did this represent?* [Three]
  - *In what **pathway** did the Earth and the **Moon** travel?*
  - *What energy, smooth or sharp, did we use to show the lunar phases?* [Smooth]
  - *Why did we choose smooth energy to show the **Moon's** shape changing?* [We used smooth energy because the **Moon's** shape changes smoothly and continuously.]

DEBRIEF & REFLECT *(Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet outcomes?)*
(5 minutes)

- Answer the following question in your science notebooks: How do the Earth and the Moon move around the Sun? Make an illustration of the pathway in which the **Moon orbits** around the Earth and the Earth revolves around the Sun.
- How does dance help me understand how the Earth and the moon move around the sun?

EXTENSION *(Expectations created by the teacher that encourage students to participate in further research, make connections, and apply understanding and skills previously learned to personal experiences.)*

- Watch the video and discuss how the Earth and Moon revolve and rotate around the Sun.
- If the Sun, **Moon**, and Earth were animals, which kinds of animals or insects would you choose and why? Consider the size, speed, energy, and shape.
- Research how old you would be if you lived on the **Moon**?