**Lesson Identification & Learning Goal**

**Prepared by**: Rachel Forstat

**Name of CT:** Mr. Cotter

**Date (lesson planned)**: Week of October 26, 2009

**Date(To be taught):** November 18 and 19, 2009

**Curriculum material sources**:

* Michigan Grade Level Content Expectations (GLCEs), Fourth Grade, Earth Science
* Department of Education, Science Fourth Grade GLCE Companion

(Accessed from the Michigan Department of Education website: <http://www.michigan.gov/mde/0,1607,7-140-28753_33232---,00.html>)

**Title**: Battle Creek Area Mathematics & Science Center Curriculum Guide

**Author**: Battle Creek Area Mathematics and Science Center Outreach Staff and Teachers from Participating Districts

**Publisher**: Battle Creek Area Mathematics and Science Center

**Unit Title:** View From Earth

**Lesson Title:** Solar Dance

**Grade Level:** Fourth Grade

**Learning Goals** to be addressed in the lesson from the Michigan Grade Level Content Expectations (GLCEs) and the related main ideas and practices within those learning goals

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| Process GLCE:  **S.IP.04.11**  **Accessed from:** MichiganDepartment of Education’s Fourth Grade, Earth Science GLCEs ([*http://www.michigan.gov/documents/mde/4-Science\_COMPLETE\_12-10-07\_218319\_7.pdf*](http://www.michigan.gov/documents/mde/4-Science_COMPLETE_12-10-07_218319_7.pdf)) | **S.IP.04.11**: **Make purposeful observations of the natural world using the appropriate senses.** |
| Related Main Ideas:  **Accessed from:** Battle Creek Area Mathematics and Science Center Curriculum Guide | * Observing the motions of objects in the sky through the use of models and role-playing; requires participation, cooperation, careful observation, and asking questions * Observing patterns while participating in experiences will generate higher-level thinking and consequently, more questions. * Taking notes and drawing pictures in a journal will help record observations and in turn, make them more comprehensible. |
| Related Practices:  **Accessed from:** MichiganDepartment of Education’s Fourth Grade, Earth Science GLCEs (<http://www.michigan.gov/documents/mde/4-Science_COMPLETE_12-10-07_218319_7.pdf>)  Battle Creek Area Mathematics and Science Center Curriculum Guide | * Observe the motion of a model Earth, Moon, and Sun multiple times. * Role-play the motion of the Earth and Moon in relation to the Sun and record observations. * Record those observations by drawing pictures of those motions and labeling aspects of those motions with the correct conventions science journals. * Think critically and analyze the questions and statements being contributed. |
| Content GLCE:  **E.ST.E.2**  More specifically: E.ST.04.21, 22, and 23.  **Accessed from:** MichiganDepartment of Education’s Fourth Grade, Earth Science GLCEs ([*http://www.michigan.gov/documents/mde/4-Science\_COMPLETE\_12-10-07\_218319\_7.pdf*](http://www.michigan.gov/documents/mde/4-Science_COMPLETE_12-10-07_218319_7.pdf) )  Battle Creek Area Mathematics and Science Center Curriculum Guide | **E.ST.E.2: Patterns of Objects in the Sky- Common objects in the sky have predictable patterns of movement.**  *E.ST.04.21*: Describe the orbit of the Earth around the sun as it defines a year.  *E.ST.04.22*: Explain that the spin of the Earth creates day and night.  *E.ST.04.23*: Describe the motion of the moon around the Earth. |
| Related Main Ideas:  **Accessed from:** Department of Education, Science Fourth Grade GLCE Companion<http://www.michigan.gov/documents/mde/4th_Grade_Complete_1-27-09_264578_7.pdf>  Battle Creek Area Mathematics and Science Center Curriculum Guide | * The Earth orbits the sun once every 365 days (one year). * It takes 24 hours (one day) for the Earth to complete one rotation. * The Earth spins in a counter-clockwise (cc) direction. * The Moon orbits around the Earth, in a cc direction. * The same side of the Moon faces the Earth as it moves in its orbit. * It takes 29 ½ days, or about one month, for the Moon to complete its orbit. |
| Related Practices:  **Accessed from:** MichiganDepartment of Education’s Fourth Grade, Earth Science GLCEs (<http://www.michigan.gov/documents/mde/4-Science_COMPLETE_12-10-07_218319_7.pdf>)  Battle Creek Area Mathematics and Science Center Curriculum Guide | * Describe how the 24 hour cc rotation of the Earth, creates day and night. * Articulate thoughts in regards to the motion of the Moon in relation to the Earth...e.g. “The Moon spins once in its 29 ½ day, cc, orbit around the Earth and because the Moon makes one rotation during its revolution, we only ever see one side of the Moon. * Define the Earth’s orbit around the Sun as taking one year (365 days). * Use arrows on drawings to describe the motion and direction of the Moon and Earth in relation to the Sun, and write a corresponding paragraph. |

**Central Question:** How do the Sun, Moon, and Earth move in space?

**Lesson Objective(s):** After attending class, and participating in the classroom discussions and activities, the students will be able to:

1. Recognize and describe the rotation and revolution of the Earth in relation to the Sun and Moon.
2. Articulate verbally, and in writing, how the rotation of the Earth creates day and night, and how the Earth’s revolution takes 365 days (one year).
3. Identify, and explain the rotation and revolution of the Moon and how this rotation and revolution causes the lunar phases, and allows us to see one side of the Moon at all times.

**Assessment**

**Task(s):**

* Prior to initiating the formal lesson instruction, the students will participate in a classroom discussion with the intention of eliciting prior knowledge on the subsequent lesson. This discussion will be utilized as a preliminary assessment. The students will review what they have learned about the motion of the Earth and Moon in previous lessons. They will contribute ideas, opinions, and questions that will encourage authentic dialogue.
* The students will be divided into groups of four and each group will be given a specified amount of clay to use in creating models of the SME. Once the models have been made, the students will have sufficient time to manipulate the clay models and discuss their positions and motions. While they are utilizing the clay models to represent the motion of the SME; the students will also be free to role-play the different celestial bodies and explore their motions through the act of simulation. As these activities are being performed, they will be responsible for describing the motions they were role-playing and modeling.
* Each group of students will demonstrate their models of the SME to the rest of the class.
* The students will draw a diagram of the Earth, and Moon’s motion in relation to the Sun. They will label these drawings using conventions to display motion, and write a corresponding paragraph, describing the motion of the SME system, in their journals.

**Diagnostic Features:**

* I will be looking for key words and phrases, such as:
  + **Year –** Referring to the amount of time it takes the Earth to orbit one complete time around the sun. A year is about 365 days.
  + **Day –** Referring to the amount of time it takes the Earth to complete one full rotation. A day is composed of 24 hours.
  + **Counter-clockwise** – Referring to the Earth and Moon’s direction while both orbiting and spinning.
  + **Orbit –** Referring to the movement of the Earth around the Sun, and the Moon around the Earth
  + **Spin –** Referringto the movement of the Earth and Moon; their rotations (as opposed to revolutions, or orbits).
  + **The Earth takes 24 hours to spin once** – Referring to the amount of time it takes for the Earth to complete one rotation, one day, also referencing the reasons for night and day.
  + **The Earth takes 365 days to orbit the sun** – Referring to the year it takes for the Earth to make one full revolution around the Sun.
  + **We only see one side of the moon** – Referring to the length of time it takes the Moon to make one rotation.
  + **The Moon takes about a month to orbit the Earth** – Referring to the length of time it takes for the Moon to orbit the Earth; it takes 29 ½ days to make one full revolution around the Earth.
* I will be listening for these key words and phrases being used during the student activities and discussions.
* I will be observing the role-play and model activity for the correct demonstration of the motion of the Earth and Moon in relation to the Sun.
* I will be looking for correctly constructed diagrams of the Earth and Moon’s movement in relation to the Sun; using correct conventions and displaying the correct movement and position.
* I will be looking for these key words and phrases when evaluating the students corresponding journal entry concerning the motion of the SME.

**Knowing Your Students**

In order to preparing for this lesson, I conducted a Science Talk with a group of three fourth grade students. The Science Talk I administered has provided me with an adequate overview of my fourth graders’ ideas, and prior knowledge in regards to my science “big idea”, i.e., “How do the Earth, Moon, and Sun move in space?” The purpose for my Science Talk was to gather information in regards to my students’ knowledge and understanding on the motion of the Earth, and Moon in relation to the Sun. I also wanted to have a sufficient understanding on the class’s sense-making process. To prepare for teaching my lesson, I put together a list containing the following questions:

1. You’ve been studying the moon as a class for a couple of weeks now…why don’t you talk to me about what you’ve learned so far.
2. In the conversations you’ve had as a class, you’ve also spent some time discussing the earth in relation to the moon…can you tell me a little bit about that?
3. What do you know about the sun?
4. How does the earth move?
5. How does the moon move?
6. How does the sun move?

When I put together this list, I focused on creating open ended questions that forced the students to think and create their own answers; they could not simply say “yes” or “no”. This enabled me to observe their thought processes, gather some information regarding their background knowledge, and construct a paradigm of the commonly held ideas of today’s fourth graders.

1. ***Commonly Held Ideas:***

According to the observations I recorded during my Science Talk on October 23, 2009, fourth graders have a number of commonly held ideas in regards to the motion of the Earth and Moon in relation to the Sun. At this point in the Earth Science Unit, “View From Earth”, accessed from the *Battle Creek Area Mathematics and Science Center Curriculum Guide*, fourth graders should have completed a number of lessons highlighting the MI GLCEs in regards to Earth Science. This denotes that at this point in time, fourth grade students within the Holt Public School District should have completed lessons referencing the following content expectations: **E.ST.04.11:** “Identify the Sun and Moon as common objects in the sky”; **E.ST.04.12**: “Compare and contrast the characteristics of the Sun, Moon and Earth, including relative distances and abilities to support life”; **E.ST.04.21:** “Describe the orbit of the Earth around the sun as it defines a year”; **E.ST.04.22: “**Explain that the spin of the Earth creates day and night”; **E.ST.04.23: “**Describe the motion of the moon around the Earth”; and finally, **E.ST.04.24: “**Explain how the visible shape of the moon follows a predictable cycle which takes approximately one month”, (accessed from: <http://www.michigan.gov/documents/mde/Complete_Science_GLCE_12-12-07_218314_7.pdf>). I wanted to bring this to light, in order to highlight why it is these fourth graders have the prior knowledge they do. During my Science Talk, I was very impressed at the level of information they were able to provide me with. They were familiar with the phases of the moon, they understood why we have day and night, they were able to articulate the direction the Moon and Earth orbit, and they were able to explain the length of time it takes for the Earth and Moon to complete one orbit.

After becoming acquainted with my students’ prior knowledge, their thinking processes, and current thoughts and ideas concerning the motion of the SME, I feel that I can create a meaningful class discussion that reviews what the class already knows, and prepares them for what they will be learning in my lesson. Having information regarding their background knowledge allows me to construct a lesson that doesn’t focus on ideas and concepts they have already addressed. I can provide information they need to know, in order to progress successfully onto the next lesson in the unit.

1. ***Previous Experiences and Funds of Knowledge:***

In relation to the Earth Science Unit, my fourth grade students have had an adequate amount of out of class experiences that allow for the development of scientific knowledge. One such experience was instigated by my CT (Mr. CT). Mr. CT instructed his class to make daily Moon observations and record what they viewed in the sky, in a “Moon Notebook”. This authentic activity had students participating in scientific experiences outside of the classroom. They observed phenomena that provided them with meaningful knowledge in regards to the predictable patterns of movement of common objects in the sky, (**E.ST.E.2**, accessed form: MI GLCEs, <http://www.michigan.gov/documents/mde/Complete_Science_GLCE_12-12-07_218314_7.pdf>).

During my Science Talk, I was able to form a decent understanding of the experiences and knowledge my fourth grade students had encountered and absorbed outside of the classroom. For instance, pertaining to the second question I asked my students during the Science Talk, i.e. “Can you tell me what you know about the earth”, the students were able to provide me with a large amount of information; referencing the earth’s rotation (direction and duration), and the sun’s “apparent” movement across the sky. One student, Katie\*, said, “Yeah! The earth spins left to right and that’s why the sun rises in the east and sets in the west…when I go on vacation to Lake Michigan, I watch the sun set with my mom”. I was very impressed with Katie’s ability to relate her learning with an experience she had outside of class. After she added that, both Jordan\* and Evan\* chimed in and began telling stories about times they have seen the sun set. I was able to observe their abilities to associate the patterns and explanations they have discussed in class to the experiences they have had outside of school.

I really enjoyed listening to my students recount experiences they had outside of school in relation to their science topic. When I teach this lesson, I will make a point to highlight the experiences that Katie\*, Evan\*, and Jordan\* conveyed to me. Whenever an opportunity to relate scientific knowledge to relevant experiences in a fourth grader’s life presents itself, I cannot ignore it! If I can make successful connections between activities experienced both in and out of class, I think I will have created a very meaningful lesson.

1. ***Linguistic, social and academic challenges, resources and supports:***

My fourth grade class is very well behaved. Thanks to Mr. CT’s classroom management techniques, his rules and regulations, and the emphasis he places on respect, the students I will be teaching are very well mannered, eager to participate, and excited to learn. I do not anticipate any severe problems in relation to management occurring. If they do, I will be prepared to acknowledge student miss-behavior, and speak to the “problem-maker” individually, if necessary.

Creating a lesson which addresses the many different social, linguistic, and academic challenges that present themselves in a classroom is a necessary task. However, I am placed in middle, to upper class, white elementary school. There is one student who is an English language learner (ELL), but he will not be present for the duration of my lesson. During the time I will be presenting my lesson, he will be working on literacy in the resource room. There is one student who experiences particularly intense social anxiety, yet this normally occurs in the morning when she first arrives at school and thanks to some smart thinking on Mr. CT’s behalf, she is able to re-locate to a quiet classroom area to gain composure before the school day begins. Due to this management technique, this student is fully collected and ready to begin her day by the second bell, and I will not need to provide any additional support. However, if any such problem does occur, I will be prepared to ask whoever is causing problems to re-locate themselves to an area away from the rest of the class (a technique utilized by Mr. CT).

\* - Student names have been changed to protect their privacy.

**Instructional Approach** - Activity sequences with rationales

My lesson “Solar Dance” is the eighth lesson (out of 15) in the *View From Earth,* Earth Science curriculum unit. The lessons that precede mine cover a range of concepts that all relate to the Earth and Moon. My lesson comes directly after a lesson entitled, “Comparing the Sun, Moon, and Earth”. This is the first lesson in the unit which introduced the Sun to the students. My CT did a good job of acknowledging the Sun in the previous lessons; however, lesson seven, and lesson eight (my lesson) are the first lessons to put an emphasis on the Sun in relation to the Earth and Moon. Two major concepts that were introduced previously were: “Why do we have day and night?” and “Understanding Lunar Phases”. These two concepts introduced ideas that are necessary for understanding subsequent lessons, i.e., my lesson and lessons that follow. The question, “Why do we have day and night?” directly relates to Michigan’s Grade Level Content Expectations (GLCEs) for Fourth Grade Earth Science; specifically: **E.ST.04.22 “**Explain that the spin of the Earth creates day and night”. This GLCE underlines a concept that students need to understand as a precursor to my lesson. Understanding the lunar phases is an important concept for students to grasp before venturing onto an understanding of the motion of the Earth and Moon in relation to the Sun. This lesson was introduced after the lesson concerning the question of day and night. Once the students were able to grasp the motion of the Earth, it was a simple step to progress to the motion of the Moon, i.e. lunar phases. If students have an understanding of why we have day and night, and the lunar phases, then moving on to discussing the motion of the Earth and Moon in relation to the sun is a simple step.

After my lesson, comes lesson nine. Lesson nine’s central question is: “How does the motion of the Sun, Moon and Earth relate to the measurement of time?” This lesson is a logical step to take after discussing the motion of the Earth and Moon in relation to the Sun. They are able to take the knowledge they learn in my lesson and apply it to the concept of time.

**Materials Needed:**

For each student:

* 2 pages from their student journal; one page to draw a diagram and write a paragraph, and a second page with two questions to be answered.

For each group of 4:

* 2 sticks of clay
* 2 – 3 toothpicks

For the class:

* White Board
* Dry Erase Markers

**Lesson Procedures Table**

*Learning Goals:*

1. Make purposeful observations of the natural world using the appropriate senses.
2. Describe the orbit of the Earth around the sun as it defines a year.
3. Explain that the spin of the Earth creates day and night.
4. Describe the motion of the moon around the Earth.

*Objective:* After attending class, and participating in the classroom discussions and activities, the students will be able to:

1. Recognize and describe the rotation and revolution of the Earth in relation to the Sun and Moon.
2. Articulate verbally, and in writing, how the rotation of the Earth creates day and night, and how the Earth’s revolution takes one year.
3. Identify, and explain the rotation and revolution of the Moon and how this rotation and revolution causes the lunar phases, and allows us to see one side of the Moon at all times

**DAY ONE: (55 minutes)**

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| **Activity Element**  **&**  **Time** | **Procedures and management** | **Students** | **Academic, social & linguistic resources and support** | **I-AIM**  **Connection** |
| **Introduction to the lesson: “Solar Dance”**  (3 minutes) | I will begin by introducing myself and explaining an “important rule…the only way you can talk is if you are holding our ‘Talking Stick’…this blow up globe”. I will explain that throughout our class discussions, I want them to raise their hands and if they are given the globe they will have the opportunity to talk and voice their thoughts and opinions, and they will then be responsible for tossing the ball to one of their peers who has their hand raised.  Next, I will ask if anyone has any questions. If there are questions, they will be answered and if there are none, I will move on to the lesson introduction…    I will present the class with the central question: “Today we will be discussing an important scientific concept…‘How do the Sun, Moon, and Earth move in space?’” | The students will be sitting quietly at their desks, in table groupings of four.  Their attention will be focused on me and they will be listening attentively and preparing to voice their thoughts and opinions in a mature and respectful way for the class discussion.  If any student has a question in regards to the “Talking Stick” they will have a chance to ask those questions at this time. | I will provide the students with a “Talking Stick”, i.e. a blow-up globe that will act as a motivator to students who do not always speak up in class. | “Establish A Question”  (Accessed from: *Inquiry-Application Instructional Model* [I-AIM]) |
| **Transition**  (2 minutes) | After introducing the lesson and establishing the central question, I will ask the students to get out their student journals and other previous assignments that relate to the SME. I will ask the class to help me review the information we already know in regards to the Earth and Moon. I’ll explain that we’ll have a class discussion and I want them all to participate and voice their opinions in a mature and thoughtful way. | The students should be preparing their thoughts and ideas for a class discussion.  They will be retrieving their student journals and any other materials they find helpful.  If there is a large amount of noise, I will say, “There is no reason for you all to be yelling, I don’t see any of you holding the ‘Talking Stick’, so I shouldn’t be hearing any voices”.  They may be reviewing their learning materials, in order to present their thoughts and ideas with evidence. | At this time, there is not any academic, linguistic or social support that needs to be provided…if students have questions at this time, I will answer them. |  |
| **Activity 2:** **Classroom Discussion** (concerning any prior knowledge students have in regards to the Sun, Earth, and Moon).  (15 minutes) | I will ask the students some leading questions, such as:  1. You’ve been studying the Moon as a class for a couple of weeks now…why don’t you talk to me about what you’ve learned so far.  2. In the conversations you’ve had as a class, you’ve also spent some time discussing the Earth in relation to the Moon…can you tell me a little bit about that?  3. What do you know about the Sun?  4. How does the Earth move?  5. How does the Moon move?  6. How does the Sun move?    I will encourage the students to participate with the intention of eliciting prior knowledge on the subsequent lesson. This will be utilized as a preliminary assessment.  As the class is reviewing previous concepts that relate to the motion of the SME, I will be making a class fact list of their ideas. I will be looking for a number of understandings. | The class will be raising their hands, taking turns, and not yelling out their thoughts and opinions during the discussion.  The “Talking Stick” will be utilized at this time; the students will only talk with this in their hand.  The students will contribute ideas and questions in a mature and respectful way (without interrupting and using their inside voices); encouraging authentic dialogue.  I will be looking for student responses that contain the following:   1. The Earth spins on its axis, in a cc direction. 2. It takes 24 hours (one day) for the Earth to complete one rotation. 3. It takes 29 ½ days, or about a month, for the Moon to complete its orbit around the Earth, in a cc direction. 4. The same side of the Moon faces the Earth as it moves in its orbit around the Earth | During this activity, I will provide the “Talking Stick” as a social resource and support. The globe will inspire students to become more involved in the class discussion due to the “toy” appeal.  I will write the ideas, thoughts, facts, etc. that the students come up with on the board that way the class will have a written reference point to focus on when discussing the patterns and investigations of the lesson.  I’ll make a point to get everyone involved in the discussion, through asking them specific questions or referring to a previous comment they made in class. | “Elicit Students’ Initial Ideas”  (Accessed from: *Inquiry-Application Instructional Model* [I-AIM]) |
| **Transition**  (5 minutes) | I will give a brief description of the activity I want the students to participate in:  “Today, we are going to explore the relationship between the motions of the Earth, and Moon in relation to the Sun.”  I will ask the students for their ideas as to how we could demonstrate the motion of Earth and Moon in relation to the Sun. | The students will listen attentively and focus their attention on me as I explain the activity.  They will listen respectfully, and ask questions if they do not understand something. | Besides making myself available to answer questions, there isn’t any other social, academic, or linguistic support that needs to be provided. |  |
| **Activity 3: Modeling and Role-Playing:** the Motion of the Earth and Moon in relation to the Sun.  (25 minutes) | I will divide the class into groups of four.  “We’re going to begin exploring the motion of the Earth and Moon in relation to the Sun using a clay model, and role-play.”  I’ll make sure to tell the students that the focus of this activity is not on the creation of exact scale models; rather it is on the motion of the Earth, Moon and Sun (SME). (The students have worked with scale models on a previous lesson so they have a entry level understanding on how to create scale models and what they are used for. While this is wonderful that they understand this concept; it is not the focus of our lesson for the day; therefore, I want to make sure that is not what they are focusing on.)  I’ll distribute two sticks of clay and 2-3 toothpicks to each group. I’ll invite the groups to make models of the SME and brainstorm ideas of how to do it.  I’ll make sure to give the groups sufficient time to manipulate the clay and discuss the position of the objects and their motion.  I will facilitate group activity by circulating among the students and observing their models and listening to their conversations.  To check each student/group’s progress and help the class rely on what they have learned, I will ask:   1. Can someone explain what you have done so far? 2. What do you already know about the motion of the Earth? The Moon? 3. Why did you choose to make the balls that size and place them in that position? 4. How does that motion relate to the motion involving the Sun? 5. Why do you think that? 6. Do the rest of you agree? Disagree? Why? Why not? 7. Does anyone have the same idea but a different way to demonstrate or explain it? 8. Can you explain why your model makes sense? | Students will actively participate in the activity.  They will manipulate the clay into three balls to represent the SME.  They will use these clay representations to model the motion and positions of SME.  The students will actively role-play the motion of the SME through simulation and they will take turns acting as the SME. | In order to provide linguistic, social, or academic support, I will circle the room, answer questions and provide feedback where necessary. | “Explore Phenomena For Patterns”  (Accessed from: *Inquiry-Application Instructional Model* [I-AIM]) |
| **Conclusion**:  (5 minutes) | I’ll encourage the groups to share and compare their ideas with other groups, and present their findings to the class.  I will ask the class to relate how the use of models was helpful in understanding the motion of the Earth and Moon in relation to the Sun. | Students will demonstrate their findings to the class and they will share and compare their models with one another.  The students will listen attentively and focus their attention on whoever is speaking and be respectful of their peers. | Besides making myself available to answer questions, there isn’t any other social, academic, or linguistic support that needs to be provided. | “Explore Ideas About Patterns”  (Accessed from: *Inquiry-Application Instructional Model* [I-AIM]) |

**DAY TWO (55 minutes)**

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| **Activity Element**  **& Time** | **Procedures and management** | **Students** | **Academic, social & linguistic resources and support** | **I-AIM**  **Connection** |
| **Activity 1:**  **Classroom discussion.** Reviewing the findings from the previous day.  (15 minutes) | I’ll re-introduce the lesson from the previous day by instigating a class discussion; reviewing the information we found. (I will create a chart of the information discussed the day before and put this on the board as we, the class, go over it. This way, the students will have a visual aid to help stimulate their thinking.)  I’ll ask the students to describe the motions of their models from the day before and to explain the patterns they saw. I’ll ask them why they think they saw those patterns.  I’ll scaffold the conversation in order for the scientific explanation to become clear. I will help the students come up with the evidence to back up this scientific explanation. And we will compare the students’ ideas with the correct explanation.  The Earth spins on its axis, in a cc direction.  It takes 24 hours (one day) for the Earth to complete one rotation.  It takes 29 ½ days, or about a month, for the Moon to complete its orbit around the Earth, in a cc direction.  The same side of the Moon faces the Earth as it moves in its orbit around the Earth  The Earth takes 365 days to orbit the sun in a cc direction, about one year.  I will relate the scientific explanation to a new and different context: “If you are 4 years old…how many times has the Earth orbited the Sun? Or “If you are 4 years old, how many months have you been alive?” and I’ll make sure they back up their answers with evidence. | Students will share and compare their models from earlier.  Students will respectfully discuss their ideas and listen to the ideas and thoughts of their peers.  Students will back up any idea or opinion they state with evidence. | I will have the “Talking Stick” to help inspire even the quiet students to participate.  I will write down the facts and ideas that the students and I are come up with, in regards to the scientific explanation to our lesson’s central question. By writing these on the board I will be providing the students with a written reference point for them to look back on when finishing up the subsequent activity. | “Students Explain Patterns”  “Introduce Scientific Ideas”  “Compare Student and Scientific Ideas”  “Apply to Near and Distant Contexts with Support”  (Accessed from: *Inquiry-Application Instructional Model* [I-AIM]) |
| **Transition**  (5 minutes) | I will give a brief description of the next activity  “Everyone please take out your student journals, turn to pages…answer the questions and draw a diagram demonstrating the motion of the Earth and Moon in relation to the Sun. Make sure to use the correct conventions, e.g. arrows, in your illustration. Write a corresponding paragraph to describe your drawing.”  I will ask the students if they have any questions. | They will quietly retrieve their journals and any other materials they find helpful.  Students should be preparing their thoughts and ideas for their journal entries.  If there is a large amount of noise, I will say, “There is no reason for you all to be yelling, I don’t see any of you holding the ‘Talking Stick’, so I shouldn’t be hearing any voices”.  They may be reviewing some of their materials in order to present their thoughts and ideas with evidence to back them up. |  |  |
| **Activity 2:**  Writing in Journals and drawing diagrams  (25 minutes) | I’ll be walking around the classroom reviewing the students work and looking for a number of understandings.  I’ll be looking for responses, that contain the following:   1. The Earth spins on its axis, in a cc direction. 2. It takes 24 hours (one day) for the Earth to complete one rotation. 3. It takes 29 ½ days, or about a month, for the Moon to complete its orbit around the Earth, in a cc direction. 4. The same side of the Moon faces the Earth as it moves in its orbit around the Earth 5. The Earth takes 365 days to orbit the Sun in a cc direction, about one year. | Students will begin working on the two assignments…answering the two questions and drawing a diagram of the motion of the Earth and Moon in relation to the Sun and writing a corresponding paragraph.  If they have questions they will raise their hands and be respectful and patient.  The students will work diligently and be quiet in order to prevent distracting their classmates. | I will walk around the class in order to aid students and help answer any questions they may have. | “Students Explain Patterns”  “Introduce Scientific Ideas”  “Apply to Near and Distant Contexts with Fading Support”  (Accessed from: *Inquiry-Application Instructional Model* [I-AIM]) |
| **Conclusion:**  (about 5 minutes…however much time is left) | I will thank the students for participating and ask for any of their suggestions as to how to do this lesson in the future…is there a better way to demonstrate the motion of the Earth, and Moon in relation to the Sun? | At this point, the class will be packing up their things.  They will offer suggestions or they may not have any ideas. Either way, it’s ok. |  |  |