



LESSON EXEMPLAR in SCIENCE 7 SOLAR AND LUNAR ECLIPSE

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LEARNING STANDARDS		
Course Intended Learning Outcome(s) (CILO)/Most Essential Learning Competencies (MELCS)		
1. Explain how solar and lunar eclipses occur using models. (S7ES-IVh-9)		
Objectives	Content	Tasks (What tasks should I give to students to ensure realization of the objectives)
<p>1. Describe how shadows are formed.</p> <p>2. Explain how solar and lunar eclipse occur.</p> <p>3. Create an eclipse model.</p> <p>5. Relate scientifically the different beliefs and practices in the community in relation to lunar eclipse.</p>	<p><i>The occurrence of solar and lunar eclipse</i></p>	<p>1. Invite student to block light with their hands and arms to cast animals and other fun shapes onto a wall. Simple shadow puppets include a dog, a bunny, and a bird.</p> <p>2. Watch a video clip about the wobble movement of earth and moon to the sun.</p> <p>3. Watch video hooks for the occurrence of solar and lunar eclipse.</p> <p>5. Learners will create an eclipse model.</p> <p>6. Watch a movie clip about Apocalypto, Here Comes the Bride and the Tale of a Dragon and Seven Moons (Bakunawa Story).</p> <p>7. Conduct an interview to the elders of the community for their superstitious beliefs and practices for the occurrence of lunar eclipse.</p>

FILIPINO LEARNER

Diagnosing the Learner

Based on your survey, describe the target audience for this lesson; what types of learning styles will you need to be mindful of?

Class/Learner's Demographic Profile

Year Level: **7**

Course/Discipline: **Earth Science**

Number of Students: **40**

Gender: **15 Male, 25 Female**

Disability: *dysgraphia*

Ethnicity: **none**

Language(s): **English, Filipino/Tagalog, Bicol – Prieto Diaz, Bisakol**

Other forms of Heterogeneity (e.g., Technical Capability, economic status, race, disability, others with special needs)

- 15 of the students owned a smart phone and laptop/desktop computer. However, they are not yet capable of manipulating office application.
- Most of my students belong to poor family.
- They are all Filipino, Bicolanos and Bicolanas.

Misconception/Course Topic Impression

To refute the following;

1. Bakunawa Myth

- In the Philippines, some people believe that a giant dragon or snake called the “*Bakunawa*” in the Visayan region swallows the Moon, causing a lunar eclipse. People go out from their houses and make different kinds of noise in the belief that the disturbance will frighten the dragon to release the Moon. This tradition started from ancient Chinese.

2. The Sun is attempting to eat the Moon.

3. Superstitious beliefs

- Total solar eclipses produce harmful rays that can cause blindness.
- Eclipses will poison any food that is prepared during the event.
- If you are pregnant you should not watch an eclipse because it can harm your baby.
- There are no total solar eclipses at Earth’s North or South Poles.
- The moon turns completely black during a total solar eclipse.
- Solar Eclipses foretell major life changes and events about to happen
- The world would come to an end or a great evil would follow.
- Some Filipinos believe that eclipses signal bad events, like earthquakes or wars. Eclipses are associated with such events because some old folks believe that the magnetic fields of the earth are being disturbed when an eclipse occurs.

4. Movie

- Apocalypto Eclipse (https://youtu.be/QRvi_pvmLUU)
- The ancient Mayans said that when an eclipse happens, Kukulkan is satisfied with its fill of human blood.
- Here Comes the Bride (<https://youtu.be/HA-B49YrH-c>)
- *swapping of souls as an effect of solar eclipse*

PEDAGOGIES

Cognitive Skills (Link)	Language Function (Link)
<p><i>What skills will be addressed by this lesson?</i></p>	<p><i>What activities may be integrated in each to help enhance the learning of the content? [CLIL]</i></p>
<ul style="list-style-type: none"> • Describing how shadow is formed. • Explaining how solar and lunar eclipse occur. • Creating eclipse model. • Relating scientifically the different beliefs and practices in the community in relation to eclipses. 	<ol style="list-style-type: none"> 1. <i>Reading</i> <ul style="list-style-type: none"> • The Bakunawa Story is in Filipino and it has a subtitle in English. • Video Hooks in Bicol dialect and it has a subtitle in English

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	<p>2. <i>Listening</i></p> <ul style="list-style-type: none"> • Movie clip about Bakunawa and video hooks. <p>3. <i>Writing</i></p> <ul style="list-style-type: none"> • Making reports from the result of the interview conducted. <p>4. <i>Speaking</i></p> <ul style="list-style-type: none"> • Presentation on how solar and lunar eclipse occur using an eclipse model. • The students will conduct an interview on the beliefs and practices of the community for the occurrence of lunar eclipse.
Science Process Skills	
<ul style="list-style-type: none"> • Observing what will happen to the moon when it enters into the shadow of the earth or what will happen to the sun when the earth enters into the shadow of the moon using an eclipse model. • Predicting how solar and lunar eclipse occur. • Inferring the reason for the occurrence of solar and lunar eclipse. • Communicating the result of an interview conducted from the elders of the community regarding the beliefs and practices in relation to eclipses. 	
Future Skills (Link)	
Self-efficacy, Creativity, Cooperation Skills, Communication Competence	
Scientific Attitudes and Filipino Values	
<p>Scientific Attitudes:</p> <ol style="list-style-type: none"> 1. reliance on fact 2. analytical and critical thinking 3. evaluating/valuing information/data <p>Filipino Values:</p> <ol style="list-style-type: none"> 1. Respect for elders' beliefs. 3. Cooperation 2. curiosity and innocence 	
<p>What are the action words and vocabulary for this lesson? Please provide Mother Tongue translation for each identified vocabulary [MTB-MLE]</p> <ul style="list-style-type: none"> • Shadow = anino • Eclipse = eklipse o pagkawara kan liwanag • Solar eclipse = pagkawara kan sin ag kan aldaw • Lunar eclipse = pagdolom kan bulan • Full moon = kabilugan kan bulan • Beliefs = pagtubod • Umbra = sentro kan batik kan aldaw • Penumbra = multo kan batik kan aldaw • Total lunar eclipse = kabilugan kan pagdolom kan bulan • Partial lunar eclipse = kabanga na pagkawara kan liwanag • Penumbral lunar Eclipse = ang paglaog kan bulan sa multo kan mundo 	
<p>Key Language (Link to all constructs of Key Languages) (What children need to recognize/produce)</p>	

<p><i>Action Words (scientific processes)</i></p> <ul style="list-style-type: none"> The students will be able to show how shadows are formed from the given activity. The students will be able to manipulate the eclipse model to show and explain the occurrence of solar and lunar eclipse. The students will be able to talk with elders about their beliefs and practices for the occurrence of eclipses. 	<p><i>Vocabulary (other terms)</i></p> <p>Shadow Eclipse Lunar eclipse Full moon Solar eclipse Penumbra</p> <p>Total lunar eclipse Partial lunar eclipse Penumbral lunar Eclipse Umbr Beliefs</p>
<p><i>Language Structure</i></p> <ul style="list-style-type: none"> Use of Vocabulary Graphic Organizer 	
Write a definition	Use it in a sentence
Write a synonym of the word	Draw a Picture

TEACHER KNOWLEDGE

Technology Being Used by Students	Technology Being Used by Teacher
<p><i>What technology will my students use in this lesson?</i></p> <ul style="list-style-type: none"> Smartphone Computer laptop printer video editor google chrome Windows Media Player 	<p><i>What technology will I use in this lesson?</i></p> <ul style="list-style-type: none"> Laptop Printer Smart TV Microsoft PowerPoint Microsoft Word Video Editor/Capcut Windows Media Player Google Chrome Quizziz
<p><i>What were your reasons for choosing the technology for the students to use?</i></p> <ul style="list-style-type: none"> Smartphone for vlogging during the conduct of an interview. Computer/laptop – encoding of the report from the result of an interview. Printer – for producing hardcopy of the report. Video editor – can be used to edit learners' vlog Google chrome – to access the quizziz Windows Media Player – used to play learners' vlog. 	<p><i>What were your reasons for choosing the technology in the lesson?</i></p> <ul style="list-style-type: none"> Laptop – for encoding the lesson Printer – for producing hardcopy of the activity Smart TV – to display the presentation Microsoft PowerPoint– for presentation of salient points and content of my lectures. Microsoft Word – for making instructional materials. Video Editor/capcut – for creating and editing the video hooks Windows Media Player – used to play video. Google Chrome – for web browsing and accessing quizziz Quizziz – for creating formative assessment
<p><i>What are the limitations and potential problems in utilizing the technology?</i></p> <ul style="list-style-type: none"> Smartphone. Maybe has limited features. Computer/laptop – not well versed in using the Microsoft word Printer - availability of an ink Video editor – learners may take time for editing. Google Chrome – slow internet connectivity Power Interruptions Additional expenses for internet data 	<p><i>What are the limitations and potential problems in utilizing the technology?</i></p> <ul style="list-style-type: none"> Power interruptions Internet connectivity Additional expenses for internet data Limited skills for manipulating the video editor and quizziz

Assessment for Learning (Formative Assessment)	Teacher Competence
Assessment Strategy <ul style="list-style-type: none"> • Vocabulary Graphic Organizer – Printed/Hard copy materials • Test Questions– Non-Print/Soft Copy Materials • 	What other skills (language competence, multicultural knowledge system, TPCK) and attitudes do you need in order to implement the lesson? <ol style="list-style-type: none"> 1. Mastery of the Content of the lesson 2. Apply different pedagogical approaches and strategies. 3. Ensure that learners are task – oriented. 4. Liberation to the choice of the learners in constructing eclipse model. 5. Competence in using technology in teaching. Attitude: Being respectful to the beliefs of the community. <ul style="list-style-type: none"> Patience Creative Empathy
Feedback Strategy <ul style="list-style-type: none"> • I Used to Think.....Now I know..... • Traffic Light Dots 	
<i>Technology which will be integrated in the Assessment</i> <ul style="list-style-type: none"> • Quizziz 	
<i>Technology which will be integrated in the Feedback System</i> <ul style="list-style-type: none"> • Google Forms 	
Assessment of Learning (Summative Assessment)	Readings/Materials/Tools
<ol style="list-style-type: none"> 1. How do you know students met the learning objectives and targets? <ul style="list-style-type: none"> • Use of Rubrics for constructing an eclipse model/ vlogging/data report presentation • Get the performance/mastery level of the learners from the result of their written tests. 	<i>What materials, readings, tools do you need to improve your competence and confidence in teaching the topic?</i> <ul style="list-style-type: none"> • Phases of the Moon Model • Earth and Moon Movement around the sun.
<ol style="list-style-type: none"> 2. What technology will you use to facilitate the assessment of learning? <ul style="list-style-type: none"> • Smart TV • Laptop • Windows Media Player • Microsoft Excel 	
PROCESS	
<p><i>Walkthrough of the lesson (how will you deliver the lesson/topic (from engaging the student to ensuring achievement of learning objectives?)</i></p> <ol style="list-style-type: none"> 1. How will I ensure interdisciplinarity (Use of STEAM Approach)? <i>Inductive Reasoning. Start with a more specific hypothesis to a general notion.</i> <i>(What specific activities will integrate STEAM?)</i> S: Activity Proper – Manipulation of Eclipse Model T: Video Presentation/Vlogging E: Constructing an eclipse model Arts: Use of hand to create fun shapes shadow Use of indigenous/recycled materials for designing an eclipse model M: Measurement 2. How will I integrate culture, Language, gender and context in my lesson? Culture: <ul style="list-style-type: none"> • Know the beliefs of the elders in the community about the occurrence of eclipses, then discuss the scientific explanation of the occurrence of eclipses. Language: <ul style="list-style-type: none"> • The Video Hooks should be in bicol dialect but with subtitle in English • In Vlogging, learners may use bicol dialect. 	

Gender:

- Here Comes the Bride Movie Clip – The movie is about the swapping of souls due to the effect of solar eclipse. In this movie, there is gender equality, the casts are composed of male, female, LGBTQ.

Context:

- The learners will be grouped to same barangays and they will conduct an interview in their respective purok.

3. How will I encourage my students to communicate what they know and want to know?

- Let the learners share the experience they have or from their friends or family members during the occurrence of eclipses.
- They may also tell what their parents told them when there is solar or lunar eclipse.

4. What combination of pedagogies will I use to design the Lesson? How will I ensure the integration of the principles of inclusivity in my pedagogies?

- Constructivism and 7Es

5. What instructional flow would capture all these plans? 7Es

Lesson Phase	Essential Question/s	Activity (specify the modalities)	Expected Output/Learning
<i>Elicit</i>	<i>How shadows are formed?</i>	Invite a learner to block light with their hands and arms to cast animals and other fun shapes onto a wall, screen, or curtain. Simple shadow puppets include a dog, a bunny, and a bird.	<i>The learners will be able to describe the formation of the shadow. (The shadows are formed when the object blocks the light)</i>
<i>Engage</i>	<i>How shadow is formed in an outer space? What are the conditions for the formation of shadow?</i>	Watch a video clip about the wobble movement of earth and moon to the sun. https://youtu.be/Kt1dbwAJOZQ	<i>The learners will be able to infer the conditions for the formation of the shadow. (Alignment and position of the object to the source of light)</i>
<i>Explore</i>	<i>How shadow appeared to the earth? What will happen to the earth when it enters to the shadow of the moon?</i> <i>How shadow appeared to the moon? What will happen to the moon when it enters to the shadow of the earth?</i>	The group of learners will construct an eclipse model. (Attached herewith is the Activity Sheet #1 "Create Me A Model") * After creating an eclipse model, there will be a presentation of an eclipse model and the group will explain how solar and lunar eclipse occur using the model. (attached herewith is the rubric for creating an eclipse model and for presentation)	<i>The learners will be able to describe the appearance of the shadow to the earth and its effect on it. (The shadow appears to the earth due to the alignment of sun, moon and earth. The moon blocks the sun which causes moon's shadow. This shadow falls to the earth and makes the earth dark.)</i> <i>The learners will be able to describe the appearance of the shadow to the moon and its effect on it. (The shadow appears to the moon due to the alignment of sun, earth and moon. The earth blocks the sun which causes earth's shadow. This shadow falls to the moon and makes the darkening of the moon.)</i>
<i>Explain</i>	<i>What is a solar eclipse?</i>	* The teacher will let the students watch her video hooks about solar and lunar eclipse. * The teacher will also explain umbra, penumbra in relation to the types of lunar eclipse.	• The learners will be able to explain how solar and lunar eclipse occur. • The learners may also describe an eclipse. <u>Solar Eclipse</u> occurs when the Moon moves in a straight line between the

	<p><i>What is a lunar eclipse?</i></p> <p><i>What is an eclipse?</i></p> <p><i>Can a solar eclipse be observed in all places on Earth?</i></p> <p><i>Can a lunar eclipse be seen everywhere?</i></p>	<p>1. Use Vocabulary Graphic Organizer to describe how shadows are formed.</p> <p>2. Based from eclipse model, explain how solar and lunar eclipse occur. (In a form of test questions)</p> <p>3. Create an eclipse model using shapes in a Microsoft word</p>	<p>Sun and the Earth, the shadow of the Moon now falls on the Earth. When you are within this shadow, you will experience a solar eclipse (darkening effect).</p> <p><u>Lunar Eclipse</u> occurs when the Moon is directly on the opposite side of the Earth as the Sun. The Moon is in the shadow of the Earth. In this case, you will observe a lunar eclipse.</p> <p>ECLIPSE = is a phenomenon where a darkening effect is observed due to the formation of shadows on astronomical objects. It takes place on Earth once the Moon or the Earth changes its position and distance from the Sun.</p> <p><i>No. Since Moon is smaller as compared to the Sun and Earth, its shadow on Earth isn't very big. As a result, only some places on the planet get to witness the phenomenon. People who are on the sunny side of Earth and in the path of the moon's shadow can see the solar eclipse, while others miss it.</i></p> <p>A lunar eclipse may be viewed from anywhere on the night side of Earth. Some parts of the earth may experience total, partial or penumbral lunar eclipse. Total lunar eclipse can be seen when the parts of the moon enters into the umbra of the earth, while the other parts of the earth may only experience partial or penumbral lunar eclipse, when the moon enters to the penumbra of the earth.</p>
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<p><i>Elaborate</i></p>	<p><i>What are the misconceptions of the Apocalypto? Here Comes the Bride and Bakunawa Story?</i></p> <p><i>How do you explain scientifically the occurrence of solar and lunar eclipse?</i></p> <p><i>Do you think the movie "Here Comes the Bride" has scientific explanation?</i></p>	<ul style="list-style-type: none"> • The learners will watch a movie clip about Apocalypto, https://www.youtube.com/watch?v=Qrvj_pvmLUU&t=2s • Here Comes the Bride https://www.youtube.com/watch?v=HA-B49YrH-c • Bakunawa Story. https://youtu.be/FoSbz1fmUvg 	<p>The learners will be able to identify that the misconception in Apocalypto Movie is that solar eclipse occurs because the god of Mayan People is thirsty with the human blood, so, they need to sacrifice the lives of the people so that the sunlight may come back.</p> <p>For Here Comes the Bride, there is swapping of souls when the solar eclipse occurs.</p> <p>For Bakunawa Story, the occurrence of lunar eclipse is due the swallowing of moon by the dragon.</p> <p>The learners will be able to explain scientifically the occurrence of eclipses based from the teacher's discussion. The occurrence of the eclipses due to the alignment and position of astronomical bodies which causes shadow to earth or moon.</p> <p>No. This is just an imagination. Eclipses are natural phenomena due to the movement of astronomical bodies.</p>
<p><i>Evaluate</i></p>	<p>How the shadows are formed?</p> <p>Based from the model, how do you explain solar eclipse? Lunar eclipse?</p> <p>How do you illustrate solar and lunar eclipse?</p> <p>What are the beliefs of ancient people about the occurrence of eclipses? Is there any scientific basis on their beliefs?</p>	<p>1. Use Vocabulary Graphic Organizer to describe how shadows are formed.</p> <p>2. Learners will access quizziz from google chrome.</p> <p><i>(Attached herewith is the evaluation sheet)</i></p> <p>Reflection Questions: Traffic light dots</p> <p>Green – Successfully completed the task.</p> <p>Yellow – they are not sure about their work and would like feedback.</p> <p>Red – they feel they didn't understand or perform well the task and need help.</p>	<p><i>The learners will be able to construct a sentence that would describe the formation of shadow.</i></p>

<i>Extend</i>	<i>What are the beliefs and practices of the community for the occurrence of eclipses?</i>	<p>The learners will make a vlog while conducting an interview to the elders from their community about their beliefs and practices during eclipse. (Each Group is composed of 4 – 5 members)</p> <p>(Attached herewith is the activity sheet #2 and the rubric)</p>	the learners will be able to collect, record and report data on the beliefs and practices of the community during eclipse.
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How will the lesson delivery manifest efficient classroom management?

- Impose rules and regulations before the start of the classes.
- Group the learners beforehand and each member has their own task to do.

How will I integrate technology in the lesson delivery?

- Use of PowerPoint Presentation helps to facilitate the delivery of the lesson.
- Use of movie/video clip helps learners visualize the content of the lesson.
- For the extend part, learners may vlog the interview to the elders about the beliefs and practices for the occurrence of eclipses.

Summary: How will technology, content, and pedagogical knowledge work together in this lesson?

By the use of PowerPoint presentation, movie/video clip, the teacher will be able to communicate well the content to the learners and by the use of 7Es and Constructivism, the learners will be able to liquify the solid/concrete knowledge so that learners may easily absorbed the content of the lesson. With the pedagogical approaches that will be applied, the teacher will be able to hone the knowledge, skills and attitudes of the learners.

REFLECTIONS
(Please accomplish this part after lesson delivery)

1. *What worked or didn't work in the delivery of the lesson?*
2. *What difficulties have you encountered (during planning and delivering the lesson)?*
3. *What insight have you gained?*
4. *How do these insights connect or affect your teaching practice, and personal and professional life philosophy?*

MODIFICATIONS
(Please accomplish this part after lesson delivery)

ACTIVITY SHEET 1 CREATE ME A MODEL

Materials:
Cardboard
Paste