

## What is *Supporting STAAR™ Achievement in Science: Grade 8*?

**1**

A resource that focuses on the Texas Essential Knowledge and Skills (TEKS) identified as readiness standards while integrating appropriate supporting standards and science processes and skills.

**2**

A resource that provides opportunities for rigorous science conversations while providing support for students at varying levels of preparedness.

**3**

A resource that provides support for English language learners and struggling students through Tier I differentiated activities; scaffolds for the activities, such as graphic organizers; and facilitation questions.

**4**

A resource that supports teachers through clear procedures and facilitation questions designed to assist students with processing science concepts. This resource also includes teacher notes to aid in clarifying misconceptions learners may have about a concept.

**5**

A resource of classroom-ready 5E lessons. Student-centered Engage bridges students' prior knowledge or encourages interest in deeper exploration of the concepts in the lesson. Explore is an opportunity to "do science," providing a common experience for all students to which they can tie concepts and vocabulary. In Explain, students formalize the scientific ideas from Explore with a focus on academic vocabulary as well as procedures related to the concepts. Elaborate allows students to apply or extend their understanding of the concepts in the lesson. In addition, an intervention strategy is suggested in each Elaborate. Evaluate consists of four selected-response items and one open-ended response question that can be used to assess student understanding.

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Each readiness standard has been rewritten in student-friendly language so that students can focus their learning.

Additional TEKS that support the conceptual and procedural development of the readiness standard within this lesson are identified.

## It's Just a Phase

**Readiness Standard**  
8.7 Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon.  
(B) The student is expected to demonstrate and predict the sequence of events in the lunar cycle.

**Content Objective**  
I can determine the phase of the moon based on the positions of the Earth, Moon, and Sun, and predict the next lunar phase.

**Additional TEKS**  
8.3 Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and know the contributions of relevant scientists.  
(B) The student is expected to use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.  
(C) The student is expected to identify advantages and limitations of models such as size, scale, properties, and materials.

**English Language Proficiency Standards (ELPS)**  
1.C Cross-curricular second language acquisition/learning strategies. The student is expected to use strategic learning techniques such as concept mapping, drawing, memorizing, comparing, contrasting, and reviewing to acquire basic and grade-level vocabulary.

**Language Objective**  
I can draw and label pictures to illustrate the positions of the Earth, Sun, and Moon during the eight major lunar phases (new moon, full moon, first quarter, last quarter, waxing crescent, waning crescent, waxing gibbous, and waning gibbous).

**Prerequisite TEKS and Knowledge**  
3.8 Earth and space. The student knows there are recognizable patterns in the natural world and among objects in the sky.  
(C) The student is expected to construct models that demonstrate the relationship of the Sun, Earth, and Moon, including orbits and positions.  
• Students learn the terms *rotate* and *revolve*.  
4.8 Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system.  
(C) The student is expected to collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time.

Lesson 6: It's Just a Phase

Each lesson includes prerequisite TEKS and knowledge that may impact student success within the lesson.

Each lesson includes a language objective written in student-friendly language.

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# What is Supporting STAAR™ Achievement in Science: Grade 8?

Grouping strategies for each activity are summarized to assist in the arrangement of the classroom.

Materials for each activity are summarized for ease in preparation.

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### Notes

Read and select facilitation questions as appropriate to meet your students' needs.

| Phase     | Instructional Grouping  | Materials   |
|-----------|-------------------------|---|
| Engage    | Small groups            | <ul style="list-style-type: none"> <li>Flashlight</li> <li>Opaque ball such as a tennis ball or baseball</li> <li>Paper</li> <li>Ruler (optional)</li> </ul>  |
| Explore   | Small groups            | <ul style="list-style-type: none"> <li>8 plastic table tennis or plastic golf balls</li> <li>Hoop toy or other round frame</li> <li>8 hook and loop adhesive circles</li> <li>Black permanent marker or paint</li> <li>Hot glue or super glue (optional)</li> <li>Resealable plastic bag</li> </ul>                   |
| Explain   | Small groups            | <ul style="list-style-type: none"> <li>Materials from Explore activity</li> <li><b>Explain: Modeling Moon Phases</b></li> <li><b>Explain: Moon Phase Spinner</b></li> <li>Brass paper fastener</li> <li>Scissors</li> </ul>   |
| Elaborate | Small groups            | <ul style="list-style-type: none"> <li>3 different-sized spheres to represent the Sun, Earth, and Moon</li> <li><b>Elaborate: Lunar Phase Dice</b></li> <li><b>Elaborate: Lunar Phase Game</b>, laminated</li> <li><b>Elaborate: Lunar Phase Game Student Page</b></li> <li>Scissors</li> <li>Tape or glue</li> </ul> |
|           | Teacher-led small group | <ul style="list-style-type: none"> <li><b>Elaborate: Lunar Phase Game Student Page*</b></li> </ul>  |
| Evaluate  | Individual              | <ul style="list-style-type: none"> <li><b>Evaluate: It's Just a Phase</b></li> </ul>  |

\*For targeted students only

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The Elaborate activity has two concurrent components: a student-facilitated activity and a teacher-facilitated activity that focuses on the needs of students who are struggling with the content.

Materials that are provided to support students in need of additional help are labeled with an asterisk.

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Each activity includes directions for implementing the activity.

Each lesson includes thumbnail images of reproducible masters (RMs), answer keys, and/or activity set ups.

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## ENGAGE

*The Engage activity is designed to access students' prior knowledge of light and shadow. This activity is designed for small-group instruction.*

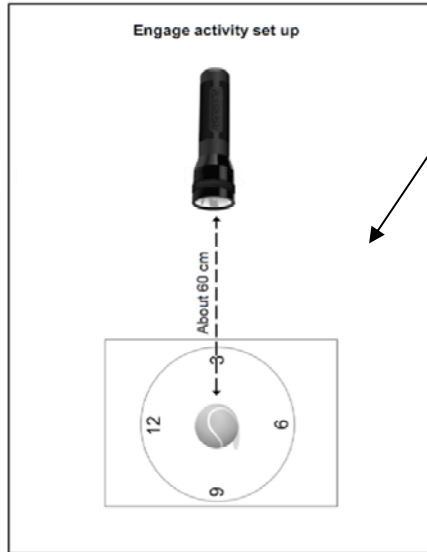
### Materials

For each group of 2–4 students

- flashlight
- white paper
- opaque ball such as a tennis ball or baseball
- ruler (optional)

### Teacher Instruction

1. Instruct each group to draw a large clock on a sheet of white paper. Students should label the three, six, nine, and twelve o'clock positions on the clock.
2. Instruct each group to place the ball at the center of the clock.
3. Instruct each group to place the flashlight at the three o'clock position approximately 60 cm (two feet) away from the ball.
4. Instruct each group to turn on the flashlight. Turn off or dim the lights in the classroom.
5. Prompt students to observe how the light shines on the ball. Encourage students to view from different directions and angles.
6. Instruct students to describe and sketch their observations in their science notebooks.
7. Instruct students to move the flashlight to the six, nine, and twelve o'clock positions and to record their observations at each position.
8. Use the facilitation questions to guide discussion.



### Facilitation Questions

- **What did you observe when the flashlight was lined up at the three o'clock position?**  
*Possible answer: The side of the ball facing the flashlight was lit up or illuminated, and the other side of the ball was dark.*
- **Approximately how much of the ball is illuminated or lit up when the flashlight is at the three o'clock position? The six o'clock position? The nine o'clock position? The twelve o'clock position?**  
*About half of the ball is illuminated when the flashlight shines on the ball from any position.*

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Each activity includes facilitation questions designed to assist teachers in guiding student discussion.

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The titles of activity masters and student pages are printed in bold for ease of reference.

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## **ELABORATE**

5. Provide a class copy of the whole answer key or part of the answer key so students can self-check during the game. (optional)
6. Use models to review answers with students. Allow students to revise and correct their answers.
7. Use facilitation questions to guide discussion after students have completed the activity.

## **Intervention**

1. Distribute **Elaborate: Lunar Phase Game Student Page\*** to each student in the intervention group.
2. Distribute three different-sized spheres, an assembled **Elaborate: Lunar Phase Dice**, and a laminated copy of **Elaborate: Lunar Phase Game** to the intervention group. Instruct students to identify which of the spheres represent the Sun, the Earth, and the Moon.
3. Read aloud the directions for the Lunar Phase Game using **Elaborate: Lunar Phase Game**.
4. Determine which student will be Player 1 and have that student roll the Lunar Phase Dice. Prompt students to observe the moon phase displayed on the top of the dice. Ask Player 1: **What moon phase is shown on the top of the Lunar Phase Dice?** (The line indicates the bottom of the diagram.) If needed, group members can help Player 1 identify the moon phase.
5. Prompt students to locate the same diagram on **Elaborate: Lunar Phase Game Student Page\*** and to write the name of the moon phase in the appropriate row of the second column titled "Lunar Phase Name."
6. Give Player 1 the three spheres and ask Player 1 to decide where to position the spheres that represent the Sun and the Earth. Once the position of the Sun and Earth have been determined, ask Player 1 to place the third sphere where the Moon would most likely be located when that moon phase is viewed from Earth. If needed, group members can help Player 1 position the moon sphere.
7. Once the group has modeled the correct positions of the Sun, Earth, and Moon, point out to students that the positions of the Sun and Earth have been provided on their student page. Prompt students to draw the Moon in the correct position in the appropriate row of the third column on **Elaborate: Lunar Phase Game Student Page\***. Students may find it helpful to move or turn their page to match the positions of the Sun and Earth on the student page with the positions of the Sun and Earth modeled with the spheres.
8. Ask Player 1 to predict the next lunar phase and the number of days it would take for the next phase to occur. Group members can assist Player 1, and all students should record the correct information on their **Elaborate: Lunar Phase Game Student Page\***.

The Tier I intervention provides instructions on how to make the science content more explicit for students struggling with the concepts addressed within the lesson. The intervention activity is at the same rigor as the activity being completed by the students in a self-directed environment.

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# What is Supporting STAAR™ Achievement in Science: Grade 8?

Each item assesses a STAAR™ readiness standard. Select items are dual-coded with scientific investigation and reasoning TEKS.

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## EVALUATE

*During the Evaluate activity, the teacher will assess student learning about the concepts and procedures that the class investigated and developed during the lesson.*

### Materials

For each student

- Evaluate: It's Just a Phase

### Directions

1. Distribute **Evaluate: It's Just a Phase** to each student.
2. Prompt students to complete **Evaluate: It's Just a Phase**.
3. Upon completion of **Evaluate: It's Just a Phase**, the teacher should use the error analysis provided below to assess student understanding of the concepts and procedures the class addressed in the lesson.

### Answers and Error Analysis for Evaluate: It's Just a Phase

| Question | Correct Answer   | TEKS Assessed (Primary Alignment) | TEKS Assessed (Secondary Alignment) | Depth of Knowledge |
|----------|--|-----------------------------------|-------------------------------------|--------------------|
| 1        | D  | 8.7B                              | 8.3B                                | 2                  |
| 2        | G  | 8.7B                              | 8.3B                                | 1                  |
| 3        | C  | 8.7B                              | 8.3B                                | 1                  |
| 4        | G  | 8.7B                              | 8.3B                                | 2                  |
|          | See below  | 8.7B                              |                                     | 1                  |
| 5        | Answers will vary but should include the following information: <ul style="list-style-type: none"> <li>• Earth does not cast a shadow on the Moon.</li> <li>• The Moon reflects light from the Sun.</li> <li>• As the Moon revolves around Earth, the amount of reflected light viewed from Earth changes.</li> <li>• The amount of reflected light viewed from Earth depends on the position of the Moon relative to the positions of the Sun and Earth.</li> </ul> |                                   |                                     |                    |

Depth of Knowledge (DOK) indicates the complexity of the knowledge the standards and assessments require of students.

Level 1 is the recall of information, such as a fact, definition, term, or performance of a simple process or procedure.

Level 2 is the application of skills and concepts requiring processing beyond recalling or reproducing a conceptual knowledge response.

Level 3 is strategic thinking requiring a deep understanding and cognitive reasoning. These standards and assessments may be complex and abstract.

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