



Battle Creek Area Mathematics and Science Center Summative Assessment - End of Unit Exam

Attached is the Summative Assessment for the Battle Creek Area Mathematics and Science Center Science Unit, Objects in the Sky. This assessment includes a number of multiple-choice questions, one constructed response question, and several items from the unit's Student Journal. Summative assessment of targeted concepts and skills provides feedback to the individual student and the teacher on conceptual understanding, demonstration of achievement of selected content, and determination of readiness for refinement and application of new knowledge and skills. The inclusion of the Student Journal items provides the opportunity to determine the level of understanding and ability of key knowledge and skills targeted in this unit. The Student Journal items evaluate individual student learning and the effectiveness of instruction. Rubrics are included in the Summative Assessment to ensure consistent scoring of the items. All components of this assessment provide multiple opportunities to assess student understanding of each science content expectation addressed in the unit.

The BCAMSC Summative Assessments are in draft form and may change based on student performance and teacher feedback. The BCAMSC Outreach Staff will use data collected from participating districts to make adjustments for the following school year.

If you have any questions or suggestions regarding the Summative Assessment, please direct your calls to Nancy Karre at (269) 965-9584 or email: nancy@bcamsc.org.



A S S E S S M E N T

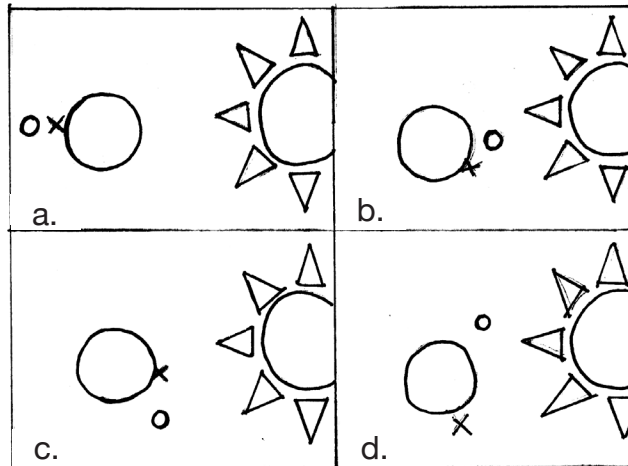


Name: _____



Date: _____

1. Which position marked with an X in the diagram below represents a location that is experiencing night?



2. Information about the planets in the solar system is constantly changing because of:

- a. less sampling.
- b. advertising claims.
- c. improved technology.
- d. science fiction films.

3. The main reason for the seasons on Earth is due to:

- a. the distance between the sun and the Earth.
- b. the tilt and rotation of the Earth.
- c. the distance from the Equator.
- d. the distance between the moon and the Earth.



Objects in the Sky (cont.)

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4. You were chosen by NASA to help establish a colony on another planet. Before the trip was undertaken, the following data was collected:

Name	Average Distance from the Sun (km)	Average Temperature	Atmosphere	Diameter (km)	Number of Moons
Venus	108,000,000	+482°	carbon dioxide	12,104	0
Mars	228,000,000	-63°	carbon dioxide, nitrogen, argon, oxygen, water vapor	6,794	2
Jupiter	778,000,000	-121°	ammonia, hydrogen, methane, helium	142,700	16
Saturn	1,427,000,000	-125°	ammonia, hydrogen, methane, helium	120,000	18

Choose the answer that lists the most important categories in the data collected that are related to supporting life on another planet.

- a. distance from the sun, number of moons
- b. distance from the sun, temperature
- c. temperature, number of moons
- d. temperature, atmosphere

5. What is the main source of light and heat that reaches the planets?

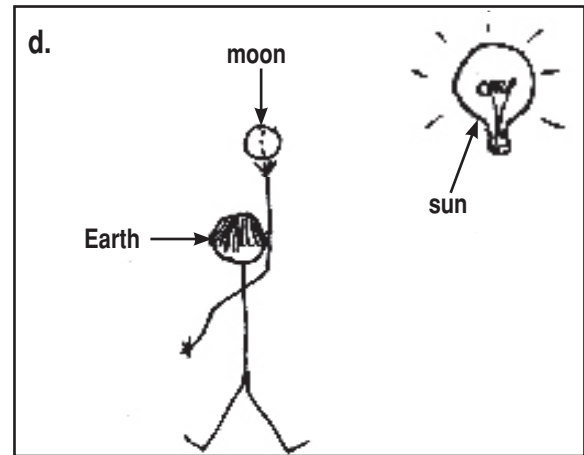
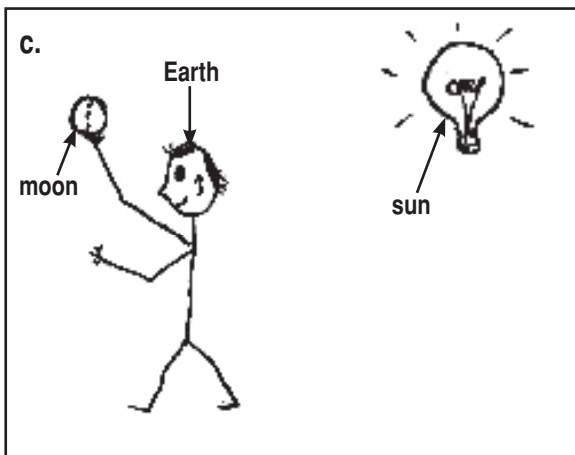
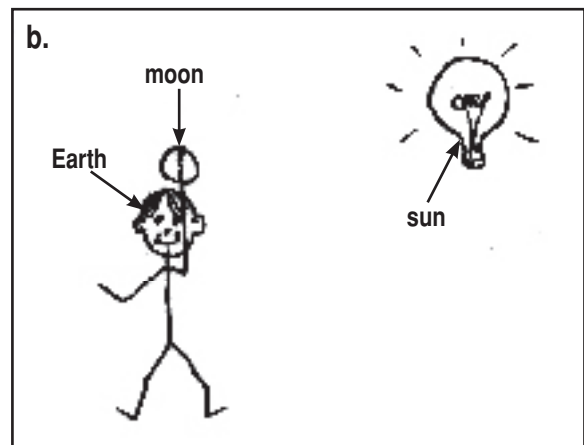
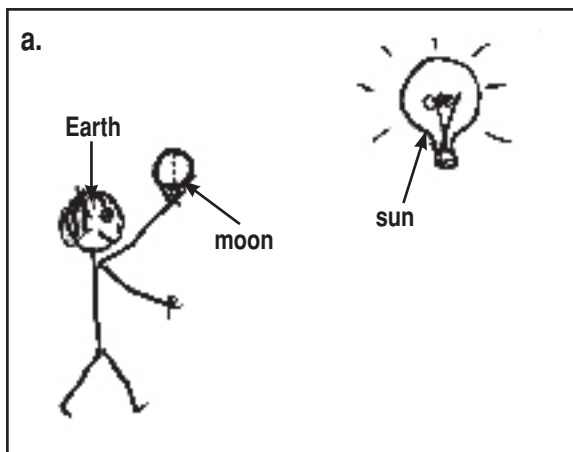
- a. stars
- b. moons
- c. sun
- d. constellations



6. The rotation of the Earth causes the:

- a. day and night.
- b. seasons and year.
- c. tides and eclipses.
- d. tides and ocean currents.

7. Mr. Peterson's class was demonstrating the phases of the moon through the use of a model. They used a lamp for the sun, tennis ball for the moon, and their heads as the Earth. Choose the model that demonstrates when the moon is in the full stage.





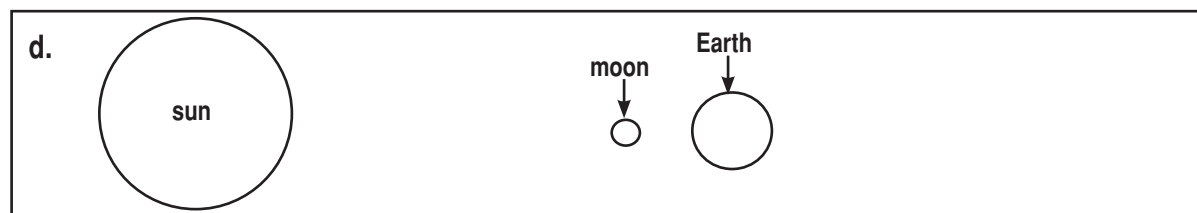
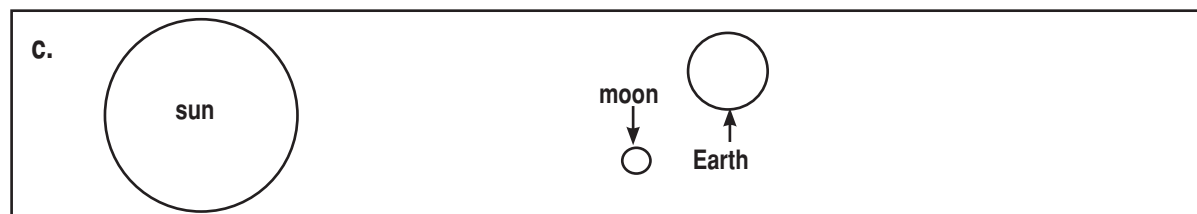
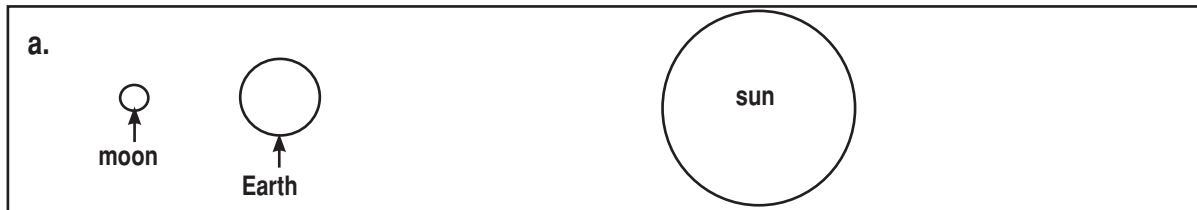
Objects in the Sky (cont.)



8. The apparent motion of the sun across the sky is due to the:

- a. revolution of the Earth around the sun.
- b. revolution of the sun around the Earth.
- c. rotation of the Earth on its axis.
- d. orbit of the sun in the galaxy.

9. Choose the illustration that demonstrates when a lunar eclipse occurs.



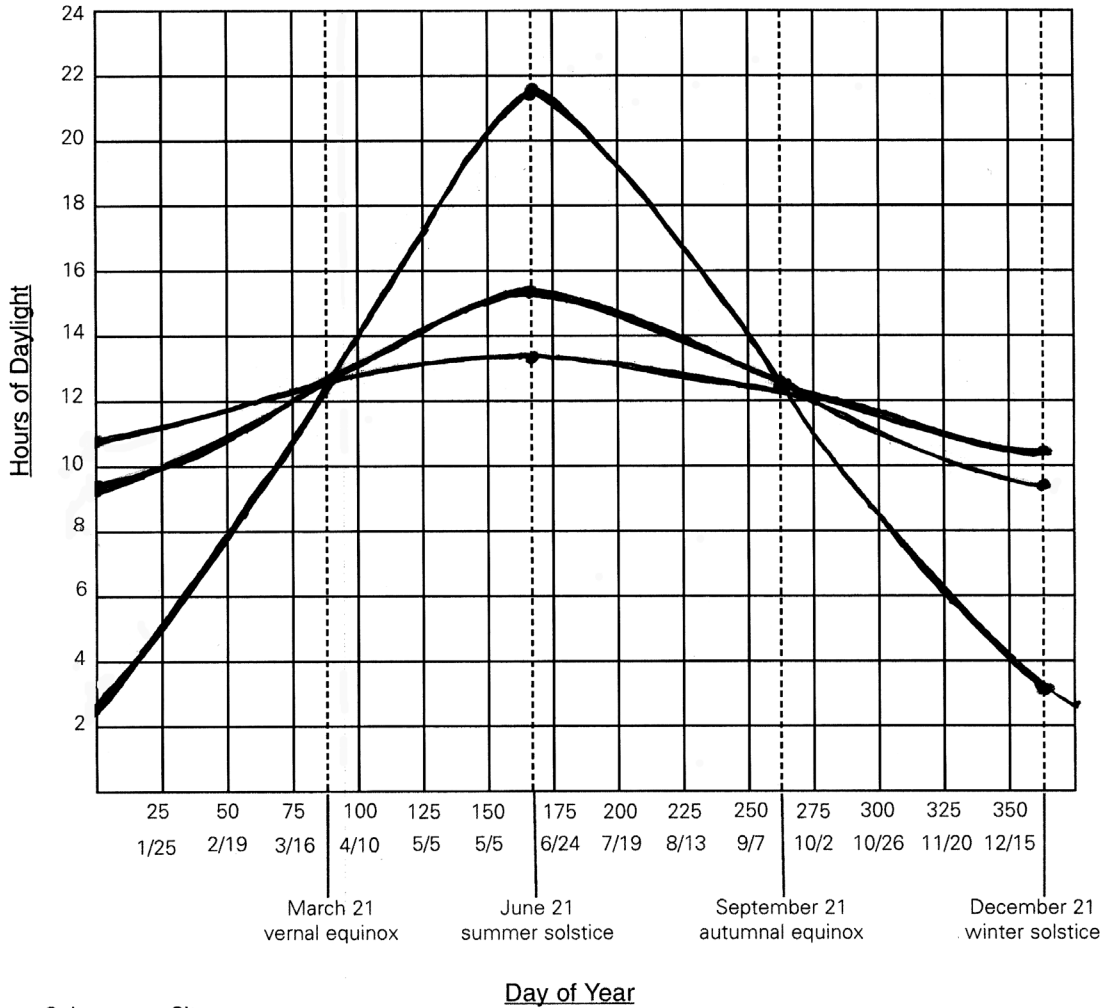


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10. The ocean tides are the rise and fall of the water level. Choose the BEST explanation of the reason for the ocean tides.
- The sun's gravitational pull as it orbits the Earth
 - The moon's gravitational pull as it orbits the Earth
 - The Earth's gravitational pull on the moon
 - The sun's gravitational pull as Earth orbits the sun
11. Choose the order that ranks the sun, moon, and Earth from smallest to largest.
- Earth, moon, sun
 - sun, moon, Earth
 - moon, Earth, sun
 - moon, sun, Earth
12. Wesley and Brenda wanted to collect data for the number of daylight hours for one full year in Fairbanks, Alaska, Lansing, Michigan, and Key West, Florida. Choose the information Wesley and Brenda need for their investigation.
- Average high and low temperature of each location for one year
 - Time of sunrise and sunset of each location for one year
 - Solstice and equinox dates for each location for one year
 - Date of season changes for each location for one year



Objects in the Sky (cont.)

13. Wesley and Brenda made the following graph from their data:



- Color** **City**
- Fairbanks, AK
 - Battle Creek, MI
 - Key West, FL

Choose the BEST conclusion based on their results:

- a. Fairbanks, Alaska has the greatest range in number of daylight hours of the three cities investigated.
- b. Fairbanks, Alaska has the coldest temperature of the three cities investigated.
- c. The equinox and solstice occur on the same day for each of the cities investigated.
- d. December 21st has the fewest number of hours of daylight.



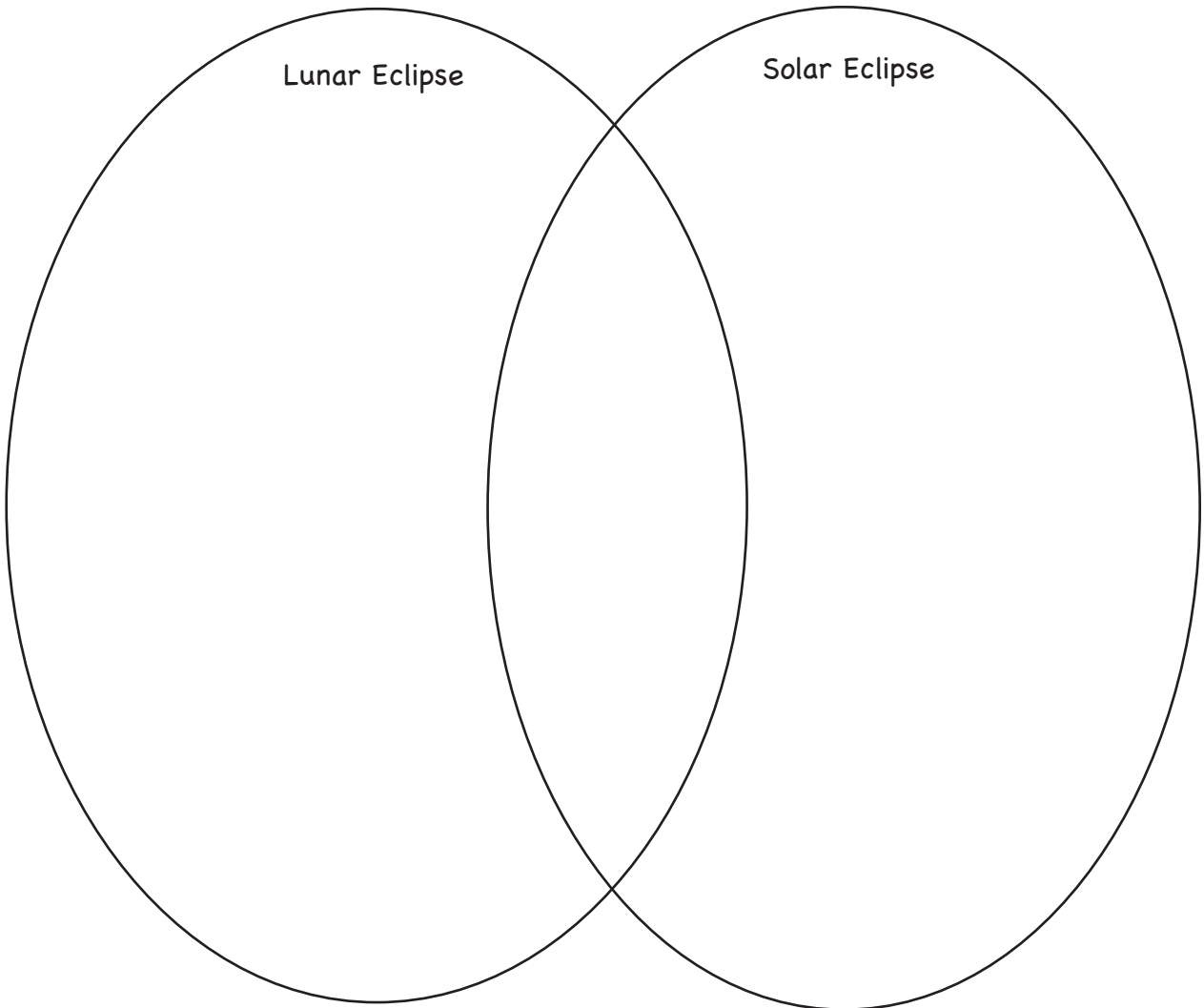
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14. Wesley thought that the difference in the number of daylight hours between the three cities was due to the climate. He thought the longer daylight hours was due to warmer weather. Brenda thought that the difference between the number of daylight hours between the three cities was due to the tilt of the Earth and the location of the cities on the Earth. Do you agree with Wesley or Brenda? Explain why.

15. Draw and label a diagram that explains why the sun appears to move across the sky.



18. Using a Venn diagram, compare the characteristics of the lunar eclipse and solar eclipse. Write how they are alike and how they are different.





19. Draw and write how the position of the sun, moon, and Earth are related to the oceans' tides. Label your drawing.

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Rubric for Objects in the Sky Summative Assessment

(Total Possible Points - 39)

Question #1: Which position marked with an X in the diagram below represents a location that is experiencing night? (E.ES.05.62)

Answer: a (1 point)

Question #2: Information about the planets in the solar system is constantly changing because of: (S.RS.05.19)

Answer: c (1 point)

Question #3: The main reason for the seasons on Earth is due to: (E.ES.05.61)

Answer: b (1 point)

Question #4: You were chosen by NASA to help establish a colony on another planet. Before the trip was undertaken, the following data was collected...Choose the answer that lists the most important categories in the data collected that are related to supporting life on another planet. (E.ST.05.11)

Answer: d (1 point)

Question #5: What is the main source of light and heat that reaches the planets? (E.ST.05.11)

Answer: c (1 point)

Question #6: The rotation of the Earth causes the: (E.ES.05.61, E.ES.05.62)

Answer: a (1 point)

Question #7: Choose the model that demonstrates when the moon is in the full stage. (E.ST.05.22)

Answer: c (1 point)

Question #8: The apparent motion of the sun across the sky is due to the: (E.ST.05.23)

Answer: c (1 point)

Question #9: Choose the illustration that demonstrates when a lunar eclipse occurs. (E.ST.05.24)

Answer: a (1 point)



**Objects in the Sky
Answer Key (cont.)**

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Question #10: Choose the BEST explanation of the reason for the ocean tides: (E.ST.05.25)

Answer: b (1 point)

Question #11: Choose the order that ranks the sun, moon, and Earth from smallest to largest. (E.ST.05.11)

Answer: c (1 point)

Question #10: Wesley and Brenda wanted to collect data for the number of daylight hours for one full year in Fairbanks, Alaska, Lansing, Michigan, and Key West, Florida. Choose the information Wesley and Brenda need for their investigation. (E.ES.05.61, S.IP.05.12, S.IP.05.16)

Answer: b (1 point)

Question #13: Wesley and Brenda made the following graph from their data. Choose the BEST conclusion based on their results. (S.IP.05.16, S.IA.05.11)

Answer: a (1 point)

Question #14: Do you agree with Wesley or Brenda? Explain why. (E.ES.05.61)

Elements

- a. Student agrees with Brenda.
- b. The tilt of the Earth determines the seasons.
- c. During the summer the top of the Earth (north) is tipped toward the sun, with more daylight hours.
- d. During the winter the top of the Earth (north) is tipped away from the sun, with fewer daylight hours.

Scoring (4 points)

- 4 - Response includes all four elements
- 3 - Response includes three elements
- 2 - Response includes two elements
- 1 - Response includes one element
- 0 - No response, no elements, can't read the answer



Summative Assessment: Student Journal

Question #15 - Activity #3, Journal Entry Question #1: Draw and label a diagram that explains why the sun appears to move across the sky. (E.ST.05.23)

Elements

- a. Includes drawing of the Earth rotating on an axis.
- b. Includes drawing of the sun.
- c. Includes arrows to demonstrate rotation of the Earth.
- d. Includes label for Earth.
- e. Includes label for sun.
- f. Includes label for rotation of Earth.

Scoring (6 points)

- 6 - Response includes all six elements
- 5 - Response includes five elements
- 4 - Response includes four elements
- 3 - Response includes three elements
- 2 - Response includes two elements
- 1 - Response includes one element
- 0 - No response, no elements, can't read the answer

Question #16 - Activity #3, Journal Entry Question #2: Explain how the rotation of the Earth makes a day. (E.ST.05.21, E.ST.05.23)

Elements

- a. It takes 24 hours for the Earth to complete one rotation.
- b. The side of the Earth facing the sun is experiencing daytime.
- c. The side of the Earth facing away from the sun is experiencing nighttime.

Scoring (3 points)

- 3 - Response includes all three elements
- 2 - Response includes two elements
- 1 - Response includes one element
- 0 - No response, no elements, can't read the answer



Question #17 - Activity #3, Journal Entry Question #3: Explain how the motion of the Earth around the sun makes one year. (E.ES.05.62)

Elements

- a. It takes one year, 365 days, for the Earth to travel around the sun.
- b. The Earth rotates 365 times during its orbit around the sun.

Scoring (2 points)

- 2 - Response includes both elements
- 1 - Response includes one element
- 0 - No response, no elements, can't read the answer

Question #18 - Activity #6, Journal Entry Question: Using a Venn diagram, draw and write the characteristics of the lunar eclipse and solar eclipse. Tell how they are alike and how they are different. (E.ST.05.24)

Elements

- a. The lunar eclipse is when the Earth's shadow is cast on the moon during the full moon phase.
- b. The solar eclipse is when the moon's shadow is cast on the Earth during the new moon phase.
- c. Both lunar and solar eclipses occur due to the path of the moon and shadows cast by the sun.

Scoring (3 points)

- 3 - Response includes all three elements
- 2 - Response includes two elements
- 1 - Response includes one element
- 0 - No response, no elements, can't read the answer

Question #19 - Activity #7, Journal Entry: Draw and write how the position of the sun, moon, and Earth are related to the oceans' tides. Label your drawing. (E.ST.05.25)

Elements

- a. Illustration includes accurate position of the sun, moon, and Earth during a high or low tide.
- b. Labels demonstrate high and low tide.
- c. The combined gravitational forces of the sun, moon, and Earth cause the world oceans to rise and fall.
- d. The moon has the greatest influence on the tides because it is so much closer than the sun.
- e. The angle of the moon with respect to the Earth changes results in different heights of tides.



Scoring (5 points)

- 5 - Response includes all five elements
- 4 - Response includes four elements
- 3 - Response includes three elements
- 2 - Response includes two elements
- 1 - Response includes one element
- 0 - No response, no elements, can't read the answer