

**LEARNING FOCUS:** • Eclipses Solar and Lunar • Occultation and Transit

This worksheet is related to Lesson 2 of your textbook

**I. Fill in the blanks with the correct option from the brackets.**

- The moon's revolutionary orbit makes an angle of about \_\_\_\_\_ ° with that of the earth ( 8, 5, 3, 6).
- On a full moon day, the intersection angle of the earth, sun and moon is \_\_\_\_\_ ° (90, 0, 270, 180).
- When the edge of the sun disc is visible as a ring, it is called a/an \_\_\_\_\_ eclipse (annular solar, lunar, partial solar, total solar)
- The dense shadow is called the \_\_\_\_\_ and the sparse shadow is called the \_\_\_\_\_ (apogee, penumbra, Krishna Paksha, umbra)

**II. Read the statements on Solar Eclipses and Lunar Eclipses, given below. Then, write 'S' in the 'box' next to a statement on Solar Eclipses and 'L' for those on Lunar Eclipses.**

- These eclipses occur on New Moon Day.
- Its maximum duration is 107 minutes.
- The shadow of the earth falls on the moon.
- These eclipses occur on Full Moon Day.
- Its maximum duration is 7 minutes 20 seconds.
- The shadow of the moon falls on the earth.

**III. Identify and write the name of the solar eclipse, in the space provided.**

A. ....

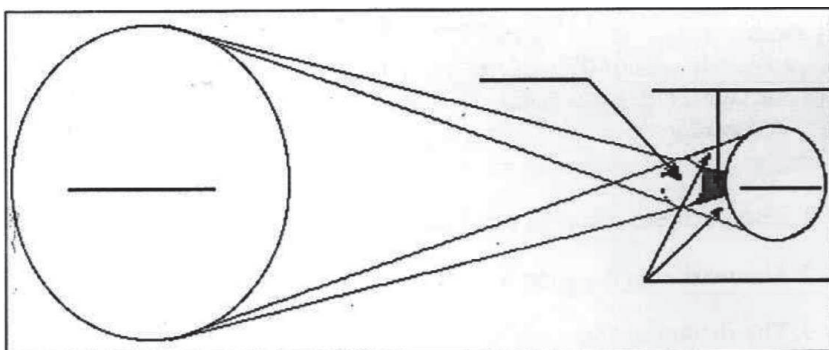
B. ....

C. ....

**IV. Answer the following questions in your notebook.**

- Are eclipses 'inauspicious'?
- What precautions should be taken when viewing an eclipse?
- What happens to birds and animals during an eclipse?
- Explain 'occultation' and 'transit'. Which is a type of solar eclipse?
- Write short notes on: 1.Moon Motions 2. Effects of the Moon's motions. 3. Moon Phases 4. Types of Solar Eclipses 5.Types of Lunar Eclipses.

- V. Label the diagram of the Solar Eclipse, given below. Mark: 1. the region from which a total eclipse can be seen, with an 'A'. 2. The region from which a partial solar eclipse can be seen, with a 'B'. 3. The region from which the solar eclipse will not be visible, with a 'C'



- VI. Draw a diagram to show the Lunar eclipse, in the blank 'box' above.

- VII. Rewrite the statements correctly, on the given lines.

1. On a Full Moon day, the sun, earth and moon are at right angles to each other.

\_\_\_\_\_

\_\_\_\_\_

2. An annular lunar eclipse often takes place. \_\_\_\_\_

\_\_\_\_\_

3. During the total lunar eclipse, the moon is partially visible. \_\_\_\_\_

\_\_\_\_\_

4. Total solar eclipse is seen all over the earth.

\_\_\_\_\_

\_\_\_\_\_

- VIII. Arrange the following steps in sequence to understand how a solar eclipse occurs. Write the serial numbers on the dotted lines.

Keep the ball steady, using a rubber or cloth ring. ....

Draw a circle along the midline of the ball to depict the moon. ....

Fix a small plastic or sponge ball on the sharp end of the pencil. ....

Place a large plastic or rubber ball 10-15 cm from this 'moon' to depict the 'earth'. Draw a circle along the midline of this ball to show the Equator. ....

Keep a ball of clay/mud in the centre of a table. ....

Arrange the 'moon' and the 'earth' such that the circle drawn on the 'moon' will be in the plane of the 'earth's' equator. ....

Observe the shadow of the 'moon' on the 'earth' to understand how a solar eclipse occurs. ....

Fix a pencil in the clay ball with its sharp end pointing upwards. ....

Hold a torch( the 'sun') 30 cm away from the 'moon', and direct the beam on it. ....

**DO YOU KNOW?** In ancient China, a solar eclipse was recorded as "The Sun has been eaten, by a legendary dragon", so the Chinese used to bang pots and pans to scare the dragon away. More recently, in the 19th century, the Chinese navy fired cannons during a lunar eclipse, to frighten away the dragon!


**LEARNING FOCUS:** • Centrifugal and gravitational forces • Types of tides

This worksheet is related to Lesson 3 of your textbook.

I. Choose the correct word from the 'box' to fill in the blanks, and complete the sentences.

Neap \* waves \* rotation \* centrifugal \* tides \* revolution \* Spring

- \_\_\_\_\_ are the rise and fall of the levels of sea water, occurring daily and regularly.
- \_\_\_\_\_ means 'going away from the centre'.
- The centrifugal force is generated due to the \_\_\_\_\_ of the earth.
- \_\_\_\_\_ tides occur on new moon and full moon days.

IIA. Draw and label this diagram, writing the moon phases and also types of tides, in the given spaces.

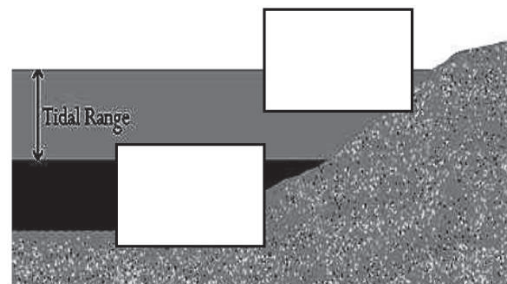
Moon Phases



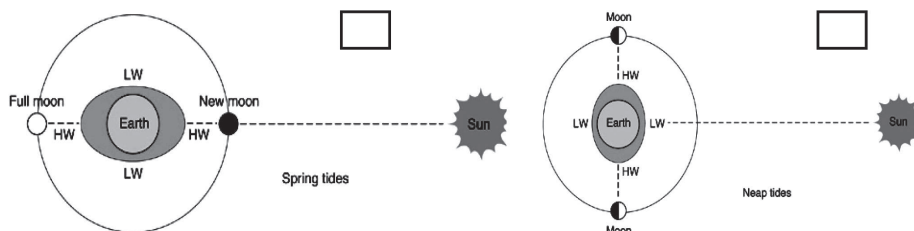
Week 1      Week 2      Week 3      Week 4

Types of Tides

IIB. Write 'H' and 'L' to show high and low tides, respectively.



III. Write 'S' for Spring Tide or 'N' for Neap Tide in the 'box' at the top of each figure. Then, fill in the columns of the Table with the required information about Spring and Neap tides.



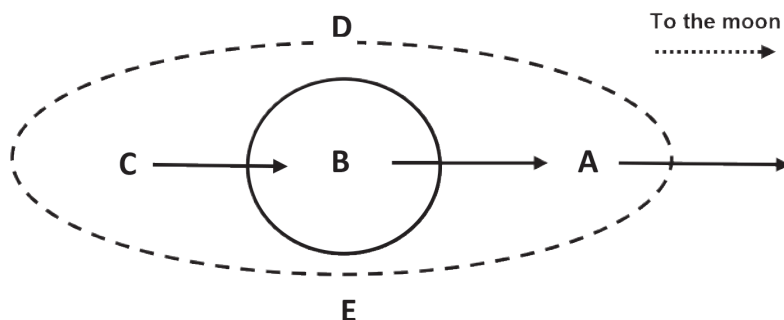
DETAILS REQUIRED	SPRING TIDE	NEAP TIDE
Direction of the forces of the sun and moon		
Days of occurrence		
High Tide and Low Tide levels		

**DO YOU KNOW?** Tides are created because the Earth and the moon are attracted to each other, just like magnets. The moon tries to pull at anything on the Earth to bring it closer, but the Earth is able to hold onto everything, except the water. Since the water is always moving, the Earth cannot hold onto it, and the moon is able to pull at it. If the Moon were to escape, there would not be any lunar tides on the Earth, only solar tides, but with about 1/3 or so of the amplitude. The daily high and low tides would be smaller. However, there would be no 'Spring' or 'Neap' tides.

IV. Write TRUE or FALSE next to each statement, on the given lines.

1. The centrifugal force acts in a direction opposite to the gravitational force. \_\_\_\_\_
2. The highest intertidal range in the world is found in the Gulf of Khambat. \_\_\_\_\_
3. When there is high tide at  $0^\circ$  and  $180^\circ$  meridians, low tide will occur at the  $90^\circ$  meridians. \_\_\_\_\_
4. Tides are not continuously occurring phenomena. \_\_\_\_\_

V. Look at the position of the earth and the moon in the figure below. Then, circle, colour, draw and complete the statements, as required, to find out how tides are generated.



1. 'Circle' the point where the moon's gravitational force is maximum, in RED.  
The moon's gravitational force is maximum here because \_\_\_\_\_
2. 'Circle' the point where the moon's gravitational force is minimum, in BLUE.  
The moon's gravitational force is minimum here because \_\_\_\_\_
3. 'Circle' the point where the moon's gravitational force and the earth's centrifugal force are equal, in GREEN. This is because \_\_\_\_\_
4. Fill in the areas of High Tide and label as HT. High tide occurs here because \_\_\_\_\_
5. Fill in the areas of Low Tide and label as LT. Low tide occurs here because \_\_\_\_\_

VI. Give reasons for the following statements in your notebooks

1. The moon's gravitational pull is more effective than the sun.
2. A place on the earth located opposite to a point experiencing high or low tide also experiences high or low tide respectively at the same time.
3. The tide on full moon and new moon days is much higher than the average high tide.
4. Large rockets going into space have to act against a force.

VII.- Answer the following questions, in your notebook.

1. What are the factors responsible for the occurrence of tides?
2. Describe 'High Tide' and 'Low Tide'.