

Appendix B3): Teacher Instructions and answer key for Gizmo :

Part 1: Gizmo Warm-up

The *Tides* Gizmo™ shows the relative positions of the Earth, Moon, and Sun. (None of the distances are to scale.) An observer stands on Earth.

1. Set the **Speed** to **Slow**. Select the BAR CHART and press **Play** - *students asked what they notice – should take notes on sheet and chose students to answer and share with class. This should be continued for whole exercise.*
Earth spins in a counterclockwise direction. On the bar chart, the water level goes up and down.
2. Click **pause** when the water is at its highest level. This is called high tide, what is height of water during high tide?
20 feet high
3. Click **Play**, and then **Pause** when the water is at its lowest level, called **low tide**. What is the height of water during low tide?
10 feet high
4. Click **Reset** . Click **Play**, and then click **Pause** after one day. Select the GRAPH tab. How many high tides are there in a day? *2* Low tides? *2*

Part 2: Activities

Activity A: The Moon and tides

Get the Gizmo ready:

- Click **Reset**.
- Select the BAR CHART tab.

Question: What causes high and low tides?

1. Observe: Click **Play** and watch the tides for a while on the BAR CHART and SIMULATION panes. Notice the oblong bands of water around Earth. These are **tidal bulges**.

A. How many tidal bulges are there? *There are two tidal bulges.*

B. What kind of tide does the observer experience as he passes through a tidal bulge?
The observer experiences high tide.

C. What kind of tide does the observer experience when he is between tidal bulges?
The observer experiences low tide.

D. In one day, how many times does the observer pass through a tidal bulge? *Twice*

2. Form hypothesis: What do you think causes the tidal bulges to form? *Hypotheses will vary*

3. Observe: Set the **Speed** to **Fast** and click **Play**. What do you notice about the tidal bulges

Taken from: www.explorellearning.com, *Tides*