

## Tides Activities

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Phenomenon: [Hopewell Rocks Bay of Fundy](https://www.youtube.com/watch?v=EnDJ6_XpGfo)  
([https://www.youtube.com/watch?v=EnDJ6\\_XpGfo](https://www.youtube.com/watch?v=EnDJ6_XpGfo))

Activity 1 – Ocean Motion (virtual lab started yesterday)

Activity 2 - Modeling Tides

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Background Information - [Earth, Moon and the Sun](http://earthsky.org/earth/tides-and-the-pull-of-the-moon-and-sun)  
(<http://earthsky.org/earth/tides-and-the-pull-of-the-moon-and-sun>)



**Directions:** In the space below, draw a model showing how the interaction of the sun and moon cause **spring and neap tides**. Your model must include the following elements: (1) Earth, (2) moon, (3) Sun, and (4) Change in the “bulge” of water. If possible, include the terms **apogee** and **perigee** in your model.

## Activity 3 - Using Tidal Charts

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**Directions -** Using the ***lunar calendar*** determine the dates and times for each phase of the moon during the month of May 2018. Find a suitable source for the information and write the results below.

(<https://www.timeanddate.com/moon/phases/>)

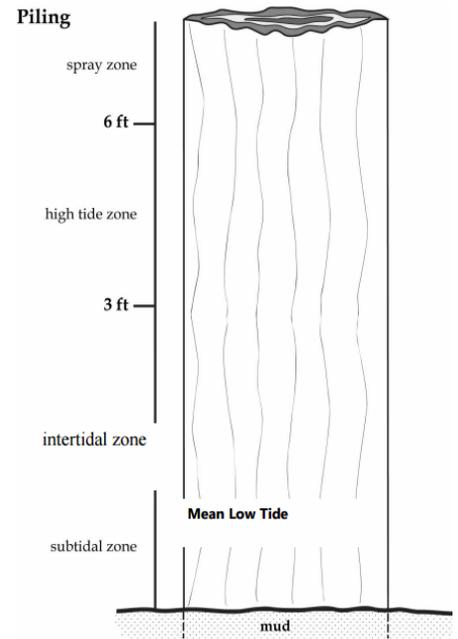
Table 2: \_\_\_\_\_

	<i>Date</i>	<i>Eastern Standard Time</i>
<i>New Moon</i>		
<i>First Quarter</i>		
<i>Full Moon</i>		
<i>Last Quarter</i>		



**Dock Piling Model**

1. Use the image of the dock piling as a template for a life size model on butcher (poster) paper. Pilings are easy places to show the vertical changes in sea level caused by tides and thus demonstrate intertidal habitats.
2. Use “sticky notes” to indicate the top of the mud into which the piling is driven and a low tide and high tide mark about 6 feet apart.
3. Review the critter cards and determine as a group where you think the animals would live on a piling.
4. Once you are confident you have placed them correctly then tape/glue them down.



*Directions: In the following table, list the animals which may live in each zone from the cards given to each group.*

**Table 3:** \_\_\_\_\_

<i>Spray Zone</i>	<i>High Tide Zone</i>	<i>Intertidal Zone</i>	<i>Subtidal Zone</i>

**15. As a group brainstorm biotic/abiotic factors and physical forces facing animals living in these areas and describe what special adaptations allow them to survive. Consider making T-charts.**



### **Acorn Barnacle**

*Chthamalus fragilis, Balanus improviusus, B. trigonus, etc.*

Location: It attaches to hard surfaces in splash and high tide zones

Food: Filter phytoplankton and zooplankton when submerged.

Behaviors, Adaptations, Characteristics:

Barnacles, which are crustaceans like crabs, have 10 hairy legs to filter food and can close their valve tight to prevent drying at low tides.



### **Atlantic Mud Crab**

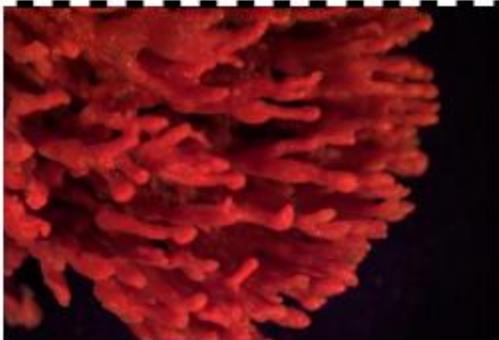
*Panopeus herbstii*

Location: crawls in mid *intertidal* to *subtidal* areas, hiding in damp places at low tides.

Food: Small oysters, worms, and crabs

Behaviors, Adaptations, Characteristics:

A crustacean with strong crushing claws, legs to hold on tight.



### **Red Beard Sponge**

*Microciona prolifera*

Location: attached to hard surfaces and shells where they are almost always wet.

Food: Filter plankton

Behaviors, Adaptations, Characteristics:

*The sponge has a crusty texture that most animals don't eat.*



### **Ribbed Mussel**

*Geukensia demissa*

Location: mid- to low intertidal zones

Food: Filter Plankton

Behaviors, Adaptations, Characteristics:

Attach to marsh grass roots or solid objects with tough "byssus" threads, secreted by a gland.



### **Eastern Oyster**

*Crassostrea virginica*

Location: mid to low tide zone

Food: Filter Plankton

Behaviors, Adaptations, Characteristics:

Attach to hard surfaces, often other oysters, forming clusters. They close tightly during low tides.



### **Sea Squirt (Sea Grape)**

*Molgula manhattensis*,

Location: low to subtidal

Food: filter phytoplankton, zooplankton, oyster and mussel larvae, and other suspended organic materials through

siphons. At low tide, they squeeze out water; this is why they are also called "sea squirts"

Behaviors, Adaptations, Characteristics:

Attach to hard surfaces in colonies



### **Pale Anemone**

*Aiptasia pallida*

Location: mid intertidal zone

Food: Stinging tentacles capture larval animals and even fish. Some of their cells contain symbiotic dinoflagellates that photosynthesize, providing more food for the anemone. Behaviors, Adaptations,

Characteristics: Form dense colonies that help prevent desiccation at low tides.



### **Sea Whip**

*Leptogorgia virgulata*

Location: low tide to subtidal waters

Food: Capture plankton using tentacles

Behaviors, Adaptations, Characteristics:

Attach to hard surfaces and have a hard flexible covering for colonial polyps.



### **Naked goby**

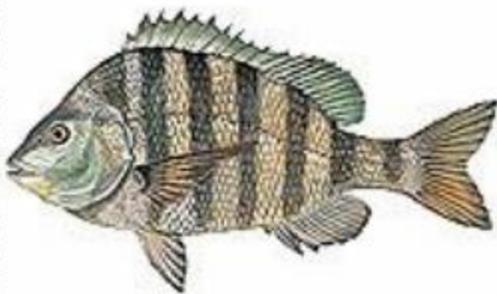
*Gobiosoma bosc*

Location: subtidal, staying along the bottom

Food: shrimps, crabs, worms and amphipods

Behaviors, Adaptations, Characteristics:

They hide in crevices in oysters and sea squirts from predators.



### **Sheepshead**

*Archosargus probatocephalus*

Location: subtidal, often found near oyster reefs and the pilings of piers, docks, and bridges

Food: barnacles, oysters, mussels, small crabs, and shrimp

Behaviors, Adaptations, Characteristics:

Has several rows of stumpy teeth, which help to crush its prey