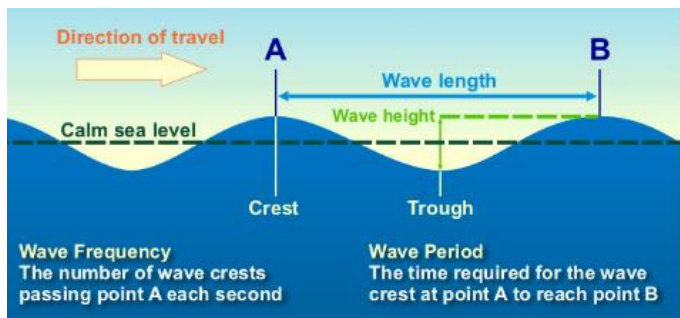


Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

Ms. Randall Marine Science

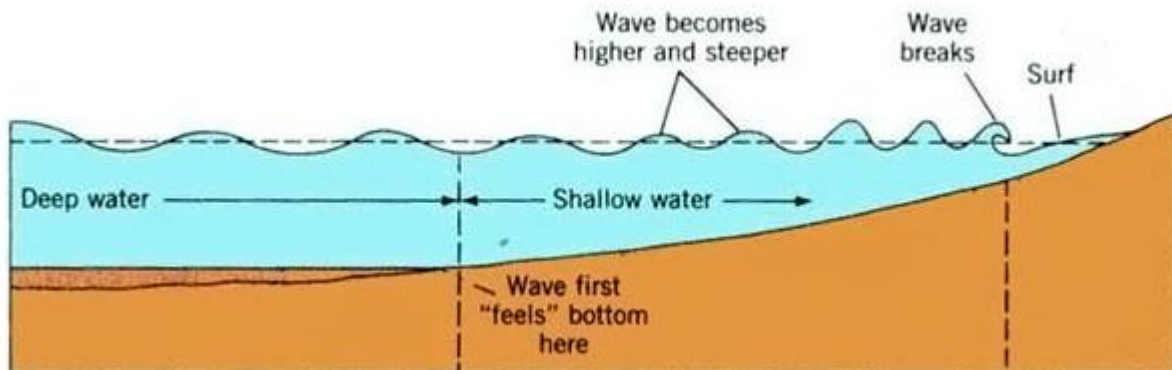
### Unit 4 Physical Oceanography Exam Study Guide

1. Draw and label a wave with the following components: crest, trough, wave height, wave length.



2. Explain how a breaker changes as it gets closer to shore.

As waves enter shallow water they slow down and they change shape, increasing in height. Longer period swells will increase more during this process than shorter period swells, which are steeper to start with. Once they reach a water depth of approximately 1.3 times their height they start to break.



3. Which type of waves are earthquake generated? **Tsunami**

4. Describe the steps to form a tsunami and travel to shore.

### How Tsunamis Form

A [tsunami](#) is a series of waves generated in an [ocean](#) or other body of water by a disturbance such as an earthquake, landslide, volcanic eruption, or meteorite impact. The picture at the left shows how an earthquake can generate a tsunami in the overlying water.

[Undersea earthquakes](#), which typically occur at boundaries between Earth's [tectonic plates](#), cause the water above to be moved up or down. Tsunami waves are formed as the displaced water, which acts under the influence of gravity, attempts to find a stable position again.

[Undersea landslides](#), which can be caused by large earthquakes, can also cause tsunami waves to form as water attempts to find a stable position.

[Undersea volcano eruptions](#) can create enough force to uplift the water column and generate a tsunami.

[Asteroid impacts](#) disturb the water from above, as momentum from falling debris is transferred to the water into which the debris falls.

When movement along a fault moves the seafloor upward, water is also pushed upward and becomes tsunami waves. As the waves approach shallower water, they become higher.

5. How are tides generated?

**Tides are periodic rises and falls of large bodies of water. Tides are caused by the gravitational interaction between the Earth and the Moon. The gravitational attraction of the moon causes the oceans to bulge out in the direction of the moon.**

6. What has the greatest influence on our tides?

**Gravity of the moon**

7. A) Which tides have one high tide and one low tide each day. **Diurnal**

B) Which tides have two high tides and two low tides each day. **Semidiurnal**

8. A) Which tides occur when the Sun, Moon, and the Earth are all aligned. **Spring tides**

9. B) Which tides occur when the Sun, Moon, and the Earth create a right angle. **Neap tides**

10. When are the tides at their greatest range (biggest bulge)?

**Full moon/New moon Spring tides**

11. What is a wave produced by the incoming tides bringing ocean water into a narrow bay or river?

**Tidal Bore**

12. What are the two major types of currents in the ocean?

**Surface and deep water**

13. A) Which type of current is driven by wind circulation? **Surface**  
 B) Which type of current is driven by thermohaline circulation? **Deep water**
14. What is a large circular flow of ocean water, or current located in each ocean basin? **Gyre**
15. What is the effect of Earth's rotation (the apparent deflection) on moving objects? **Coriolis Effect**
16. A) In the northern hemisphere, objects move in a \_\_\_\_\_ **Clockwise** \_\_\_\_\_ motion.  
 B) In the southern hemisphere, objects move in a \_\_\_\_\_ **Counterclockwise** \_\_\_\_\_ motion.
17. Which type of surface current would push you parallel down the beach, and cause beach sand erosion?  
**Longshore current**
18. Which type of surface current occurs perpendicular to shore and can be dangerous to swimmers?  
**Rip current**
19. Which type of surface current is best for coastal ecosystems by bringing cold, nutrient rich water from the deep up to shore?  
**Upwelling**
20. \_\_\_\_\_ **Colder** \_\_\_\_\_ temp + \_\_\_\_\_ **Higher** \_\_\_\_\_ salinity =  
 greater density
21. What is the thermohaline circulation?

Winds drive ocean currents in the upper 100 meters of the ocean's surface. However, ocean currents also flow thousands of meters below the surface. These deep-ocean currents are driven by differences in the water's density, which is controlled by temperature (*thermo*) and salinity (*haline*). This process is known as thermohaline circulation.

