

Concept 2

Waves

&

Tides

# LEQ 1: What are the structural parts of a wave?

A wave is any transfer of energy through water.

- The energy travels along the water's surface in the same direction as the wind was travelling, however the water molecules do not.
  - Water molecules in ocean waves actually travel in a circular motion eventually returning to their starting point.

# LEQ 1: What are the structural parts of a wave?

- Waves are made of four parts:
  1. Crest is the top most part of a wave.
  2. Trough is the bottom most part of a wave.
  3. Wave height is the vertical distance between the crest and the trough on a single wave.
  4. Wavelength is the horizontal distance between two consecutive (back to back) waves.
    - This is measured from crest to crest or trough to trough.

# LEQ 2: How are swells and breakers different?

There are two main types of waves, swells and breakers.

- Swells are regularly occurring, smooth, rounded waves in the open ocean.
  - These occur when the wind has stopped blowing but there is still energy flowing through the water.
  - The more energy flowing through the water, the larger the swell will be.

## LEQ 2: How are swells and breakers different?

- Breakers occur near shore, as the water begins to get shallower the waves slow down and collide causing wave energies to combine and increase wave height.
  - Eventually the wave will get too high and collapse on top of itself, breaking.

# LEQ 3: What are tides?

Tides are daily variations in the ocean's sea level.

- Tides are caused by the gravitational pull of the Moon (a lot) and Sun (a little) on Earth's oceans and inertia from Earth's rotation.
  - The gravity from the moon and the sun always pull on the water in the oceans creating bulges. When the coast rotates into these bulges high tide occurs. When the coast rotates out of these bulges low tide occurs.

# LEQ 4: How do the lunar phases effect tides?

Earth revolves around the sun and the moon revolves around Earth.

- When the gravity from the sun and moon combine the high tide will be very high and the low tide will be very low.
  - This is called a spring tide.
  - This occurs when the moon is in the full and new phases.

# LEQ 4: How do the lunar phases effect the tide?

- When the gravity of the sun and the gravity of the moon are perpendicular to each other there is little difference between high tide and low tide.
  - This is called a neap tide.
  - These occur when the moon is in the 1<sup>st</sup> quarter and 3<sup>rd</sup> quarter phases.

# LEQ 4: How do the lunar phases effect the tide?

- When the moon is in the crescent or gibbous phases the tides are considered normal.