Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Notes: Waves**

**What causes/creates waves on the ocean? – 3 things**

1. Wind Speed : if wind exceeds 2 m/hr or 3 km/hr, ripples will develop.

2. Time : the time at which the wind in blowing on the water.

3. Fetch : the distance that the wind has traveled across the water.

As the wind’s force increase, the ripples grow, then topple over on each other forming ocean breakers or whitecaps.

Once a wave is formed, the wind energy is transferred through the water until it hits the shore.

**Wave Erosion: How waves erode the land/cliffs.**

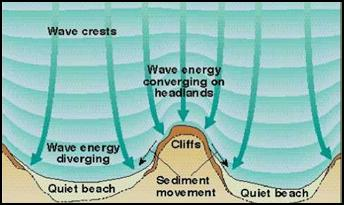
Each wave can hurl 1,000 lbs of tons of water against land, causing it to tremble.

Ex: Atlantic wave avg. 10,000 kg/m2 or 2000 lb/ft2

**Steps for breaking up rocks:**

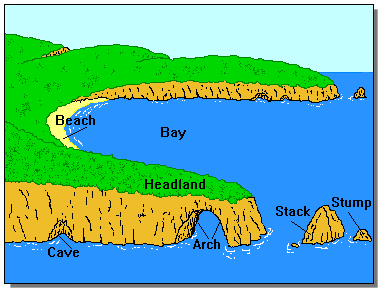
1. Force of waves can cause cracks to open up.
2. Waves are force into the crack.
3. Air in back is compressed, breaking the rock.
4. Waves subsides, causing released air to expanding rapidly.
5. Expanding air blows out rock fragments, enlarging crack.
6. Waves continue to carry sand, causing abrasion on rocks.

**Wave Refraction**: Bending of waves in the ocean due to features.



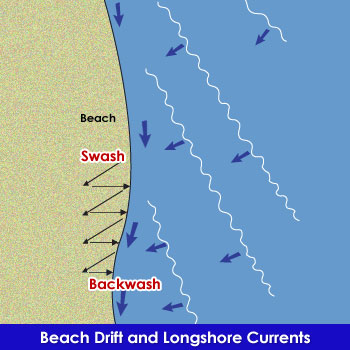
Oceans like to have “straight shorelines”.

**Sea Cliffs, Sea Cave, Sea Arch, Sea Stack, and Sea Stump Sequence:**



**Longshore current and beach drift:**

Most waves come onshore at an angle. Back & forth action migrates sands.



Waves create a current parallel to shore helping to move sand down the beach.

**Wave Cut Platforms:**

1. Wave breaks against cliff and starts to erode.
2. A wave cut notch develops at base of cliff.
3. Cliff becomes weak and breaks off.
4. Waves continue to erode cliff back.
5. Platform develops where old cliff was because waves can only erode to ½ of their wavelength.





**Tides:**

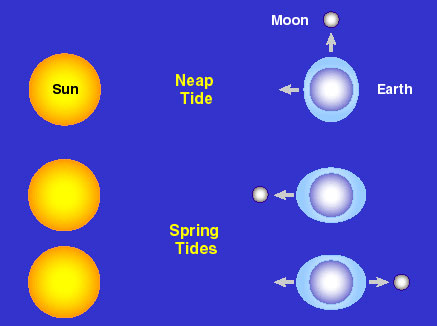
Tides: daily changes in the elevation of the ocean surface.

🡪 2 high tides, 2 low tide \*\*

🡪 caused mainly by moon and the sun

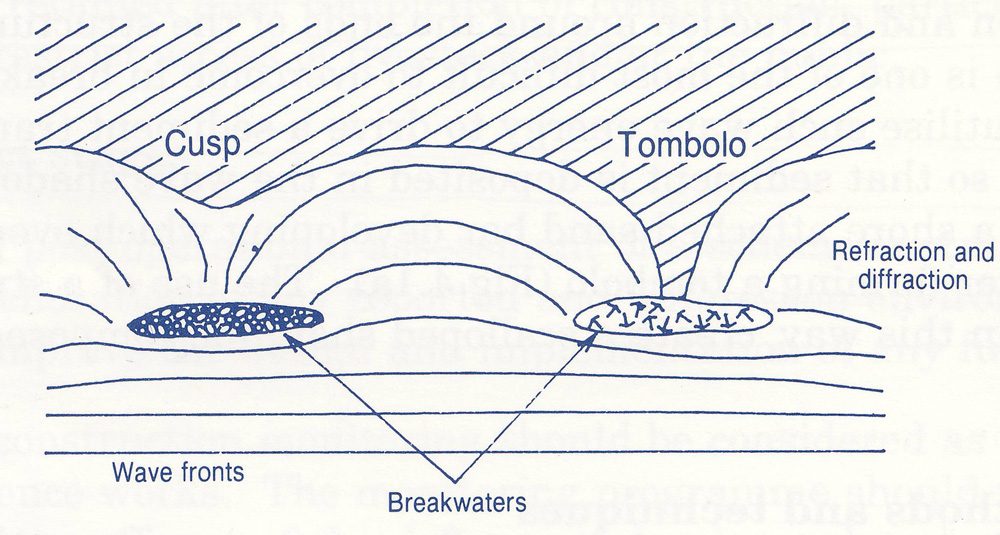
**Spring Tides:** occur when the sun & moon are aligned, happens 2x a month (full & new moon)

**Neap Tides**: occur when the sun- earth – moon are at a 90° angle.

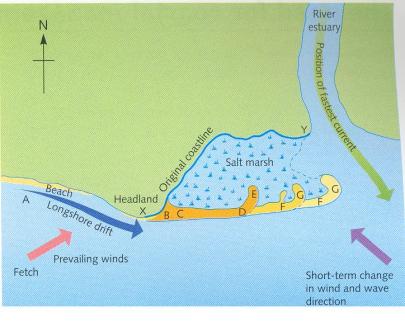


**Spits, baymouth bar, and Tombolo**

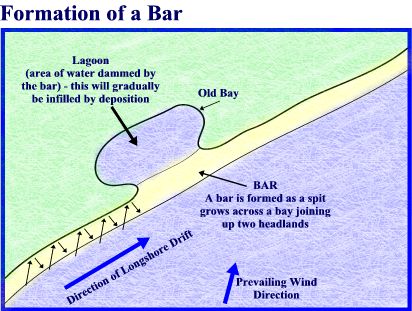
**Tombolo:** ridge of sand that connects an island to the mainland or to another island



**Spit:** an elongated ridge of sand that projects from the land into the mouth of an adjacent bay.



**Baymouth** bar: a sandbar that completely crosses a bay, sealing it off form the open ocean.



A **lagoon** that forms behind the baymouth bar.

**Groins and Jetties:**

**Groin**: barrier built at a right angle to the beach to trap sand that is moving parallel to the shore.

**Jetty**: a barrier built out into the ocean at bays to protect ships entering/exiting the bay.