**HW 4.1 – Watching Waves Name: ……………………………………**

(adapted from Exploring Our Fluid Earth)

**Procedure**

*Safety Note: Before going to a beach, check the weather and surf reports to make sure conditions are safe. Wear protective clothing, put on sunscreen, and bring water. Follow all posted signs and lifeguard directions*

1. Plan to observe the water at your favorite beach site. Keep in mind that wave watching activities usually cannot be scheduled very far ahead of time because wave conditions change rapidly. Plan to spend about 30 minutes at the site to observe wave conditions. Include a photo of you observing the waves in your report.
2. When you arrive at your site, make as many of the following observations as possible, but do not expect to observe all of these phenomena at one place or at one time.
   1. Wave shape
   2. Wavelength
   3. Wave height
   4. Wave direction
   5. Wave color
   6. Wave sound
   7. Location of wave break
   8. Number of waves breaking
   9. Smell
   10. Effect of objects such as rocks, islands, or seawalls on waves
   11. How far water goes up the shore when waves break
   12. High water mark, evidenced by wet areas, marks on sand, seaweed, shells, or salt on rocks
   13. Tide
   14. Water moving on and offshore
   15. Effect of waves on beach sand
   16. Shape of the beach
   17. Organisms in the wave zone
   18. How swimmers manoeuvre through the water
   19. Specific features
       1. **Rills**: small channels formed as waves retreat
       2. **Swash marks**: sand patterns formed as waves recede
       3. **Ripple marks**: wavelike patterns in sand formed by currents
       4. **Lamination**: sorting of sand grains by wave action
3. From a safe vantage point, sit quietly and watch the waves.
   1. For each of the phenomena listed in Step 2, observe whether the waves or effects of the waves are consistent or changing, and if they are the same across the entire beach or different from place to place.
   2. Look for patterns when making your observations.
   3. You may also describe things you notice that are not included in the list of suggested observations.
4. Share your observations.
5. (Optional) Repeat observations at a different beach site or at the same beach site on a different day.

**Activity Questions (on WORD document):**

1. Write a detailed summary of your wave observations at your site.
2. Were there any observations you were not able to complete in Step 2? Explain why.
3. If you could repeat this activity, what other questions/observations would you add to the list in Step 2?
4. Do you think the waves would be similar if you returned to your site on a different day? Why or why not?
5. What do you think are some reasons that waves at one beach can be very different from waves at another beach just a short distance away?