**\*Directions Page; Print this page and place each set of directions at the corresponding station\***

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| **Station #1: Density/Salinity Tanks**  *At this station you will observe how salt concentration can affect the density of water.*  Procedure:   1. Write a hypothesis before beginning this activity, how does salt concentration affect the density of water? 2. Select one cup that contains freshwater (blue) and one cup that contains saltwater (red). 3. Pour two cups of water into the clear container at the same time. 4. Observe how the blue and red water appear when mixed together and record your observations. | **Station #3: Canyons in Pie Pan With Confetti**  *At this station you will be blowing into a straw to model convergence zones.*  Procedure:   1. Write a hypothesis before beginning the activity, how will wind affect the “confetti”? 2. Draw the confetti placement in your data table labeled “confetti before”. 3. At the same time, you and your partner will each blow into the straws on opposite sides of the pie tin. 4. Draw the confetti placement in your data table labeled “confetti after”. |
| **Station #2: Density/ Temperature Tanks**  *At this station you will observe how temperature differences can affect the density of water.*  Procedure:   1. Write a hypothesis before beginning this activity, how does temperature affect the density of water? 2. Select one cup that contains cold water (blue) and one cup that contains hot water (red). 3. Pour two cups of water into the clear container at the same time. 4. Observe how the blue and red water appear when mixed together and record your observations. | **Station #4: Reynold’s Number Demonstration**  *At this station, you will examine how Reynold’s number affects an organism’s ability to move through the ocean.*  Procedure:   1. Consider what differs between the four cups on the table. 2. Read through the procedure and make a hypothesis about what you will observe before conducting the experiment. 3. One at a time, drop a marble into each cup and record observations of how it lands. 4. For the cups where the marble travels all the way to the bottom, gently swirl the cup and record how the marbles movement is affected by the motion of the fluid. |

--Visit each station, make predictions and observations

--Discuss questions together as a class to make sure all students understand

--Have students individually or in groups answer the “summary questions” at the end (can be graded if desired)

**Student Worksheet**

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| **Station #** | **Hypothesis** | **Drawing of Observation Before** | **Drawing of Observation After** | **Questions** |
| **#1: Salinity Tank** |  |  |  | 1. Which water type, fresh or salt, is more dense? How do you know?  Saltwater is more dense--it sinks below the freshwater.  2. How might this difference in density affect where life is found in the ocean?  If salt water is deeper, life that is not tolerant to salt will be found closer to the surface. |
| **#2: Temperature Tank** |  |  |  | 1. Which water type, hot or cold, is more dense? How do you know?  Cold water is more dense because the particles are closer together, so it will sink below hot water. When water is heated, the molecules expand and spread farther apart, making hot water less dense.  2. How might this difference in density affect where life is found in the ocean?  Life will be found closer to the surface where the water is warmer since many creatures aren’t tolerate of cold temperatures. |
| **Station #** | **Hypothesis** | **Drawing of Observation Before** | **Drawing of Observation After** | **Questions** |
| **#3: Confetti pie pan** |  |  |  | 1. What is a convergent zone?  This is an area where two currents merge and interact (Eddy or Front).  2. What pattern did you see with the confetti after the “wind” blew?  The confetti starts to collect around the canyon. |
| **#4: Marble drop** |  |  |  | 1. What is Reynold’s number?  Quantity that measures how well an organism can move through a fluid based on size--”swimmability”.  2. Which organism would feel like they were swimming in honey in the ocean?  Honey =krill  3. Which organism would feel like they were swimming in peanut butter?  PB = phytoplankton |

**Summary Questions:**

1. Predict where in your station 3 model confetti ocean you would find an organism with a low Reynold’s number. Explain your reasoning.

Organisms with a low Reynold’s number would be easily carried by currents on the water’s surface. They will likely be found

in the convergence zones.

1. The Earth warms due to climate change so therefore cold, fresh water is being added to the ocean as ice melts. Looking at the figure of ocean water layers below, where would you expect to find this water? Why?

Cold water is more dense than warm water, but freshwater is less dense than salt water therefore this ice melt would likely be found somewhere in the middle layer of the ocean.

