**THE GLOBAL OCEAN CONVEYOR BELT**

**Aim:** To investigate how ***salinity/density/temperature affect*** the global ocean circulation.

**Key questions:**

1. How does salinity affect ocean density?

2. How do differences in ocean salinity affect ocean stratification?

3. How do differences in ocean salinity contribute to the Global Ocean Conveyor Belt System?

Key words:

Density - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Salinity - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Stratification - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Experiment procedure - Part 1: Salinity**

1. Fill a small beaker with 200ml of water. Add 5g of salt. Add a few drops of yellow food colouring. Stir gently with a glass rod. Label beaker number 1.
2. Repeat with Beaker 2 adding 10g of salt and red food colouring
3. Repeat with beaker 3 adding 15 g of salt and green food colouring.
4. Take a large beaker of 1000ml and tilt it on its side. Slowly add Beaker 1 by pouring it along the side of the large beaker. Then add Beaker 2 then 3.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Colour** | **Salinity** | **Notes/results** |
| **Beaker 1** |  |  |  |
| **Beaker 2** |  |  |  |
| **Beaker 3** |  |  |  |

Describe what happened and explain why.

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**Experiment procedure - Part 2: Temperature.**

1. Now gently heat your large beaker using hot plate (low temp). Observe what happens.

**OCEAN CONVEYOR BELT QUESTIONS – testing learning**

1. Deep ocean currents are driven by:

a. tides b. density c. wind d. storms

2. In general, the oceans are:

a. the same from surface to bottom b. stratified into 2 distinct layers c. separated into different basins/oceans

3. Water can sink in water.

True/False

4. Cold water is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than hot water. Denser/saltier/lighter

5. The oceans affect the world’s climate by:

a) Exchanging heat and gases with the atmosphere

b) Transferring heat from the equator to the poles.

c) Acting as a sink for carbon dioxide.

d) All of the above.

e) None of the above.

6. Conductivity is measured to determine:

a) pressure b) depth c) salinity d) oxygen

7. Deep water formation is caused in part by:

a) high salinity, moderate density and high temperature.

b) high salinity, high density and ice formation.

c) low salinity, ice formation and low temperature.

**OCEAN CIRCULATION QUESTIONS**

1. How does ocean circulation in the Atlantic affect Europe’s climate?

2. What would happen to Atlantic Ocean water as it reaches the Arctic? Explain why this happens.

3. Assess these two graphs and explain what they are showing.





4. How might large additions of freshwater from ice cap melt affect the ocean circulation?

5. Ocean circulation is measured using CTD readings – what is this?