**ACTIVITY: Saline currents**

**Activity idea**

In this activity, students observe how freshwater and saltwater mix.

By the end of this activity, students should be able to:

* describe what happens when freshwater and saltwater mix
* understand that mixing is a result of the differences in densities of the liquids.

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**Introduction/background**

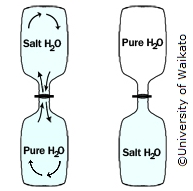
When you add salt to a glass of water and stir the water, the salt disappears. We all know the salt has not just vanished – if you taste it, you know it is still there. Have you ever thought whether the salt in the water has any effect on the water?

Freshwater that has been collected on land flows back into the oceans of our world. Do the freshwater and saltwater just mix, and if so, would this happen in any particular way?

**What you need**

* 4 x clear bottles of equal size with lids – 1.5 litre plastic bottles are good
* Marker pen
* Water
* Salt
* Blue food dye
* Thin cardboard, preferably waxy

**What to do**



* 1. Write FRESH on two of the bottles, and write SALT on the other two bottles.
  2. Fill all four bottles with water.
  3. Add a few tablespoons of salt to both of the SALT bottles.
  4. To one of the FRESH bottles, add a few drops of food colouring, enough to turn the water obviously blue.
  5. To one of the SALT bottles, add a few drops of blue food colouring, enough to turn the water obviously blue.
  6. Put the lids on all bottles and shake them, making sure the dye is evenly mixed and the salt is dissolved. Remove the lids.
  7. Set up the bottles as shown, making sure that the bottles with the blue water are on the bottom. (Make sure you do this experiment on a waterproof surface that accommodates for any unplanned water spillage.)
  8. Press the waxy cardboard on top of the water bottle without the dye before inverting it. To invert the top bottles without spilling them, try placing the cardboard over the top of the bottle, lining them up and then carefully removing the card.
  9. Ask students what they think is going to happen. Ask them to take a note of their predictions and try to be as specific as possible.
  10. Have students observe what happens once the card has been removed and check whether their predictions were correct. (The students should find that the coloured water mixes with the colourless water in one pair of the bottles but not the other.)
  11. Discuss the results. The water in all four bottles had the same temperature and both set-ups had dyed water, so there must be another driving factor for the water to mix or not. (Mixing is a result of the differences in densities of the liquids.)
  12. This activity can lead to further discussions and investigations about the effects of freshwater and saltwater mixing in the oceans. Scenarios could be rivers flowing into the sea or the freshwater locked in the glaciers on the Antarctic Peninsula that is melting and mixing with the saltwater of the Southern Ocean.