Sea Water Lab

Summary

This lab is a "station" lab where students move from one small experiment to another. There are seven stations dealing with properties of sea water.

Time Frame

2 class periods of 60 minutes each

Group Size

Small Groups

Materials

Note:
you may want to set up more that one set of materials at each station so that groups can be smaller.

- student sheet
  for all students (attached)

Station 1:
- 2 baby food jars
- red food coloring
- hot plate
- large beaker
- oven mitt
- laminated index card or piece of plastic sheet
- pie tin or cookie sheet

Station 2:
- 2 immersion thermometers
- 2 styrofoam cups
- ice
- rock salt

Station 3:
- 2 liter pop bottle with 5 holes (melted in with hot nail) up the side in a row
- masking tape
- sink

Station 4:
- test tube
- test tube rack
- 3 dropper bottles
- red and green food coloring
- fresh water
- concentrated salt solution (color red)
- weak salt solution(color green)

Station 5:
- 2 pill bottles
- concentrated salt solution
- fresh water
- triple beam balance

Station 6:

large beaker
crushed red ice (made from red food color in water)

Station 7:

plastic box
water
holes from hole puncher

Background for Teachers

Time Needed:

110 minutes, including time for discussion and for students to answer analysis questions.
This activity demonstrates a variety of sea water properties. Density is addressed by station 1, 4, 5, and 6. The ocean is a layered system with the coldest, saltiest water at the bottom because it is most dense.
Station 2 illustrates a property of salt water that is meaningful in polar areas. Water with salt in it has to be much colder for it to freeze.
Station 3 shows how water pressure increases with depth.
Station 7 shows that waves do not move water but wind does.

Instructional Procedures

Time needed for set-up may seem overwhelming but once you have done it the first time, keep the stuff together and it will be much easier the next time.
Make red ice a day before the lab.
Make cardboard cards with the station numbers on them.
Run off student sheets.
Set up stations:
Station 1: Set up two stations for this one. Place them on a counter near a sink. Have the hot plate nearby to heat the red water in a large beaker. Students should perform the experiment in the pie plate or cookie sheet so that if they spill, it doesn't go anywhere. Stream tables can be used also but are harder to empty.
Station 2: Set up two stations. The thermometers should be in the ice in labeled cups. Add quite a bit of salt to cup #2.
Station 3: Set up two stations. Needs to be next to a sink so students can fill the bottle with the tape on and then rip the tape off so that the water goes in the sink. The liter bottle needs to be prepared by melting with a hot nail 4 or 5 holes up the side so that a single piece of tape can cover them.
Station 4: Set up 3 stations for this one because it is the most time consuming. The solutions need to be available and students will need a disposal beaker when they are done.
Station 5: Set up two stations of this one because it doesn't take long.
Station 6: Set up two stations and have a bucket for disposal. A Styrofoam cup will keep the red ice frozen for the period.
Station 7: Set up two stations and do not give students many of the paper circles at a time. They tend to waste them.
If students do not finish in the time you have, demonstrate each experiment (or have a student do it) so that each student has data to record for each station.

Assessment Plan

Scoring Guide:

Students complete each station personally…….4

Bibliography

Lesson Design by Jordan School District Teachers and Staff

Authors

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