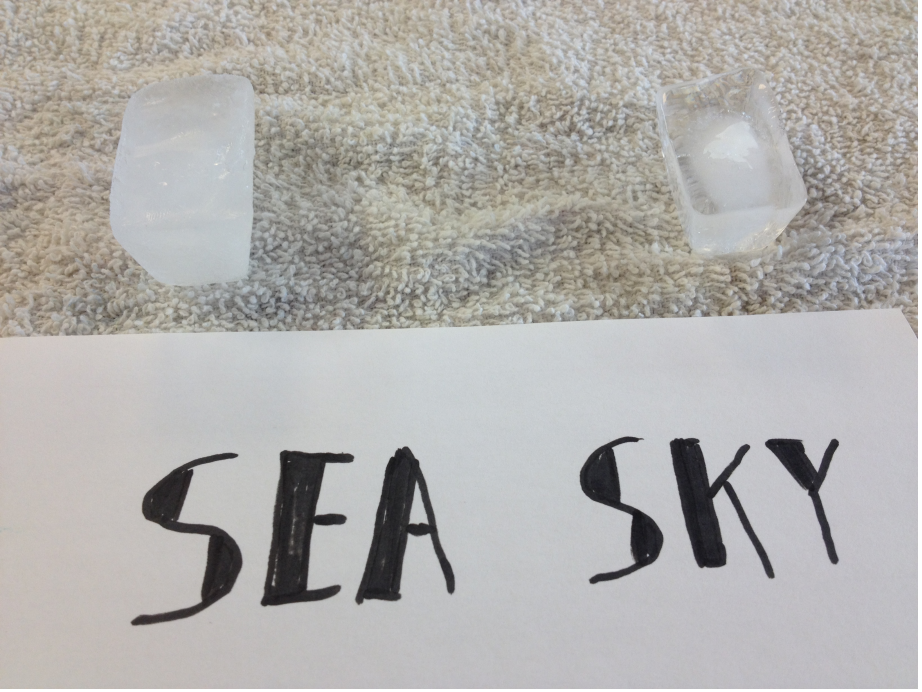
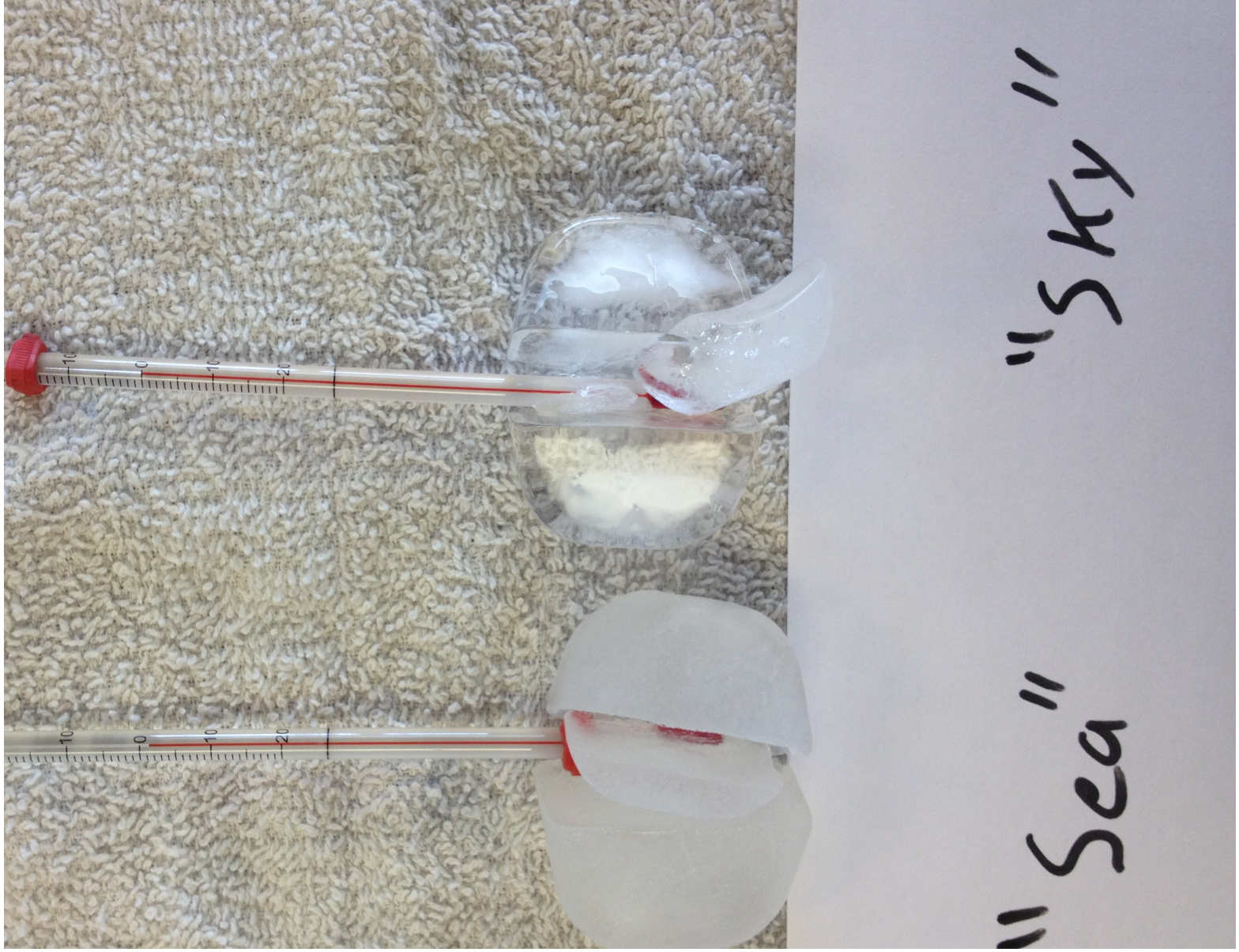
This person is standing on floating sea ice, next to a glacier formed from precipitation.

Materials: Ice cube trays, tap water, liquid measuring device, salt (mix 3.5g per 100mL), balance, food coloring, paper towels, freezer



After students record observations of ice, drip a single drop of food coloring to illustrate “sea” ice porosity



Possible extension using thermometers
("sea" ice is ~2°C colder)

Possible extension: What causes these “brinicles?”

Ice From the Ocean vs Ice From the Sky – can you tell the difference?
Name_____

Carefully observe the two ice cubes. Record your observations below:

Ice cube #1

Ice cube # 2

Some guiding questions:
1) Describe the effect that high concentration of dissolved salt has on the freezing point of water.

2) What happens to the salt in the seawater as the liquid water forms solid ice?

3) Based on your observations, what would happen if you collected the water from the melted "sea" ice and refroze it.

POSSIBLE ANSWERS to Some guiding questions:
Describe the effect that high concentration of dissolved salt has on the freezing point of water.
ANSWER: Dissolved solutes often lower the freezing point of water, so sea water in McMurdo Sound should freeze at <0°C/32°F.

What happens to the salt in the seawater as the liquid water forms solid ice?
ANSWER: Dissolved solutes are excluded from the ice and are concentrated into nearby non-freezing water, increasing the salinity and further lowering the freezing point. Teacher's NOTE: In actuality, the super-cooled liquid ("brine") is forced into tiny canals within the crystal matrix of the ice.

Based on your observations, what would happen if you collected the water from the melted "sea" ice and refroze it.
ANSWER: In theory, much of the brine solution would have leaked out of the ice cube via brine channels forming during the initial freezing process. Therefore, salt concentration should be much lower the second time around and the new ice cube should have properties similar to those of the freshwater ice.