Activity: Thermal Expansion of Seawater

This experiment demonstrates the thermal expansion of water and how it may contribute to a rise in sea level.

Materials

- 500-ml Erlenmeyer flask
- 2-hole stopper
- 8 -10 inch hollow glass tube
- Thermometer
- Hot plate

Temp. (°C)	Water level (mm)
	0

1. Fill the flask completely with water.
2. Insert the thermometer and glass tube into the holes in the stopper.
3. Insert the stopper into the flask. Make sure that there is no air trapped in the flask. Adjust so that the water is in the lower part of the tube.
4. Place the flask on the hot plate and mark the level of the water in the tube with a sharpie pen (this is your zero line) and record the initial temperature and record the data in the table.
5. Turn the hot plate on low and slowly heat the water.
6. Measure the water level in the tube at 1°C intervals and record your data in the table.

Questions

What happened to the water level in the tube as the temperature increased?

Explain what was happening to the water to cause the observed change.

Describe your observations and how it relates to a rise in sea level to due global warming.

If the volume of water expands ~0.009% for each 1°C increase in temperature (at 10°C), what would be the increase in sea level if the temperature increased by 1°C from 10-11°C and the average ocean depth is ~4000 m?