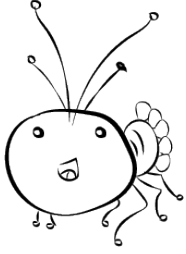


# Lab Assistant: El Nino Weather Systems



## Student Lab Objectives:

- Students create a cold water lens underneath a warm water lens using Pippi Pipette and Tedros Test Tube.
- Students make the connection that warm water is less dense than cold water which makes warm water float.
- Students make the connection that El Nino weather conditions are caused by a warm lens forming on the surface of the ocean near the equator.

## Lab Prep:

1. **Materials** –Ice water dyed blue, warm/room temp water, 1 test tube per child, one pipette per child. Prepare 6 water stations for your students outside or in the lunchroom. Each station should have ice water (dyed blue) and warm/room temp water in separate containers.
2. **Print** – Print off the student worksheet for your hands-on activities.
3. **Watch the teacher prep movie**

## Running the Lab Activity:

1. **Show the in class movie:** The movie shows the effects of El Nino on the California coastline after a storm washed millions of tuna crabs up on a beach during el nino weather conditions. The movie also demonstrates the lab objective of creating separate warm and cold water lenses in a test tube.
3. **Pass out the worksheet:** Read the worksheet with your class to review the lab procedure and lab objectives.
4. **Pass out lab materials:** Pass out one pipette per child and one test tube per child. Grab your water pitcher (From Kea), blue dye (Microscopy Koa), and your graduated cylinders (From Kea). Fill your Picher with water.
5. **Walk outside with your class:** Place two graduated cylinders at each water station. Fill the graduated cylinders with water. Add ice and blue dye to one cylinder at each station to make blue ice water. Do this part of the lab outside or in the lunchroom as methylene blue will stain your carpet.

## Discussion:

- **“Which temperature of water floated and which sunk?”** Warmer water floats on colder water. Colder water sinks.
- **“Why does warm water float on cold water?”** Warm water floats because as water warms its water molecules are move energetic, they vibrate more, and they get farther apart. When water is warmed its volume expands, making it lighter for the volume it takes up, so it floats.
- **“What does your warm and cold water lens in a test tube have to do with El Nino weather conditions?”** El Nino happens when the sun’s warmth causes a warm water lens to form on the surface of the ocean near the Earth’s equator. When winds do not blow at the equator, the warm and cold water lenses stay separate and do not mix together. This condition happens on a large scale in El Nino weather systems just like it happened in your test tube.