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## Investigation 4B: GROUNDWATER MOVEMENT AND SALTWATER INTRUSION

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**Learning Outcome:** Model saltwater infiltration into groundwater and in coastal areas and how this leads to contamination of drinking water.

### Materials

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- Awesome Aquifer kit
- white sand
- measuring cup or beaker
- salt water, dyed blue
- PVC Pipe
- small cups

### What to Do

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1. Place a PVC pipe near the middle of a clear plastic bin, which will represent a well.
2. Fill the bin approximately 1/3 full with white sand.
  - a. Add enough water to dampen the sand but not soak it. Observe the well for a minute. Pump out excess water from the sand.
  - b. Arrange the sand to form a depression near one end to represent an ocean shoreline.
3. Slowly pour blue water from the beaker into the ocean area.
  - a. Use a dry erase marker to mark the height of the ocean.
4. Build a well pump by placing a piece of nylon over the bottom of a soap dispenser pump. Secure the nylon using a rubber band.
  - a. Use the pump to remove water from the well (into a cup).
  - b. Observe the well for a minute.
5. Repeat step 4 until you notice a change in the water coming out of the well.
6. Observe changes in the ocean level and what is coming out of the well.

### Consider

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1. Use evidence from your model to describe how water moves.
  - a. How did the water movement result in a change in water quality? How else might this be tested/measured?
  - b. What other environmental factors need to be considered to fully understand saltwater intrusion?
2. How might saltwater intrusion be slowed or prevented?

### Extension – Testing Variables

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Consider other variables you can test that might affect the movement of salt water through ground water. For example, test the effect of different substrates (larger gravel, sand, local soil, or others), well location, or mitigation implementation.