Aquifer Activity

Name_____
Period_____

Introduction: An important reservoir for water, especially in the Willamette Valley, is underground in an **aquifer.** Water that falls as rain or snow sinks into the soil and fills the spaces between rock particles, the **pore space.** At some point, the water hits a barrier that has no pore space and it stops moving down. If you were digging a hole in the ground and hit water, you have found the top surface of the underground water. It is referred to as the **water table.** In this activity, you will model the movement of water underground and how building a well affects underground water.

Materials: Sand, 2 beakers, clear plastic tube, 3 plastic pipets, food coloring, graduated cylinder, spoon, marker

Procedure:
1. Place the plastic tube upright in the beaker next to the edge. Fill the beaker nearly full of dry sand.
2. Fill the graduated cyclinder with 60 ml of water.
3. Pour the water down the side of the beaker and watch as it fills the pore space in the sand. Use a marker to show where the water level is in the well.
4. One group member should use the pipet to draw water from the "well" (the plastic tube) and someone else should add water to the surface of the sand with another pipet. Place the water you take out into the graduated cylinder. Write down how many ml of water you remove in a minute.
5. Record where the water level is in the well (is it the same, below or above your first mark?) Draw the beaker showing the well and the water table.
6. Repeat the procedure again with two students adding water to the surface and one "pumping" the well.
7. Repeat again with two students removing water from the well and one adding water to the surface.
8. Add a few drops of food coloring (pollution) to the surface of the sand as far from the well as you can get. Add water to the surface as you remove water from the well. Time how long it takes to see a change. Write your observations as you watch.
9. Continue adding water to the surface and time how long it takes to clean the water as you pump the well.

Prediction: When will water level in the well go down?

Data:
From Question 4-ml per minute from the well =_____

From Question 5, 6, 7 – diagram level of water in the well

From Question 9 - movement of food coloring:
-How long for surface pollution to reach the well? _____
-How long for the well to clear up? _____

Adapted from the Utah Department of Education Science Curriculum: Earth Systems
http://www.slc.k12.ut.us/staff/larmad/science/Link%20Files/Earth_Systems_Details/Lessons/AquiferActivity4obj1.pdf

Analysis:

1. How can you tell where the water table is?

2. What do you notice about the level of the well and the water table?

3. Why must the well be deeper than the water table?

4. What would happen to a basement built below the water table?

5. How does pollution of the surface of the land affect a well?

6. What property of water allows it to become polluted?

7. Why is clean water in wells important to the people of the Willamette Valley?

Conclusion: Tell me two additional things you learned:

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