

Drinking Water

Where does my drinking water come from?

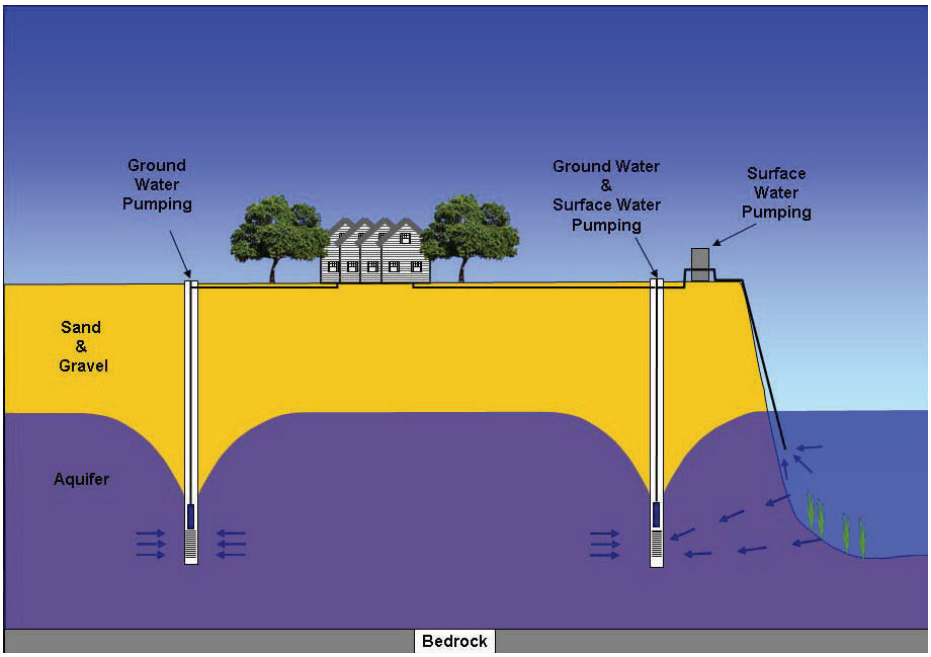
Objective: Learn about drinking water and it's different sources

Grades: 3-6

Materials:
- Drinking water animation
- Large beaker
- Gravel
- Paper cup
- Two syringes and tubing
- Crayon or marker

Drinking Water:
Everyone needs water to drink, bathe, and flush toilets. Where does this water come from, and how do we get it to our homes and schools? All our drinking water comes from either ground water or surface water.

How do we get water out of the ground? We need to drill a **well**! A well is a pipe that is long enough to reach from the ground surface to the aquifer below. We can then pump water from the aquifer. First we need to drill a hole to put the pipe into and we do that with a drill rig.





Page 1 Drill Rig

A **drill rig** will remove soil, sand and gravel and create a hole that may be anywhere from 20 feet to several hundred feet deep to reach the ground water. A pipe made of steel or plastic is placed into the hole or **boring**.

The next step is to put a **well screen** at the bottom of the pipe below the water. The well screen is full of slots and will let water in but keep out all the sand and



Steel and Plastic Well Screen

Once the screen is placed into the hole or boring, a **pump** is need to pull water from the aquifer to the ground surface. There are many kinds of pumps. One of the most common types is called a submersible pump because it is placed inside the boring all the way down to the top of the screen. Another smaller pipe that is long enough to reach the surface is screwed into the pump. This pipe carries the pumped water to the top of the well and is called a **discharge pipe**.



Submersible Pump

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When the well is done, the top of the well is sometimes left outside in the open. Other times, a small building called a well house may be built to house all the plumbing.

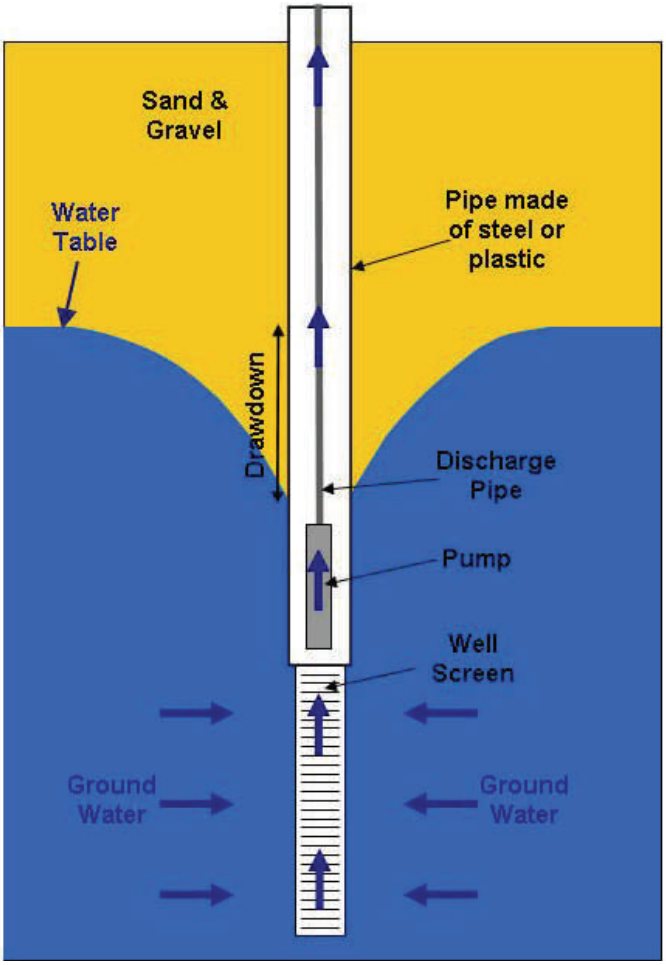


Top of Well Outside



Well House

As the well is pumped, the ground water level around the well will go down. The farther away you are from the well, the less the ground water level will go down. The amount that the ground water level decreases in the well is called the **drawdown.** The more water you pump, the greater the drawdown around the well.



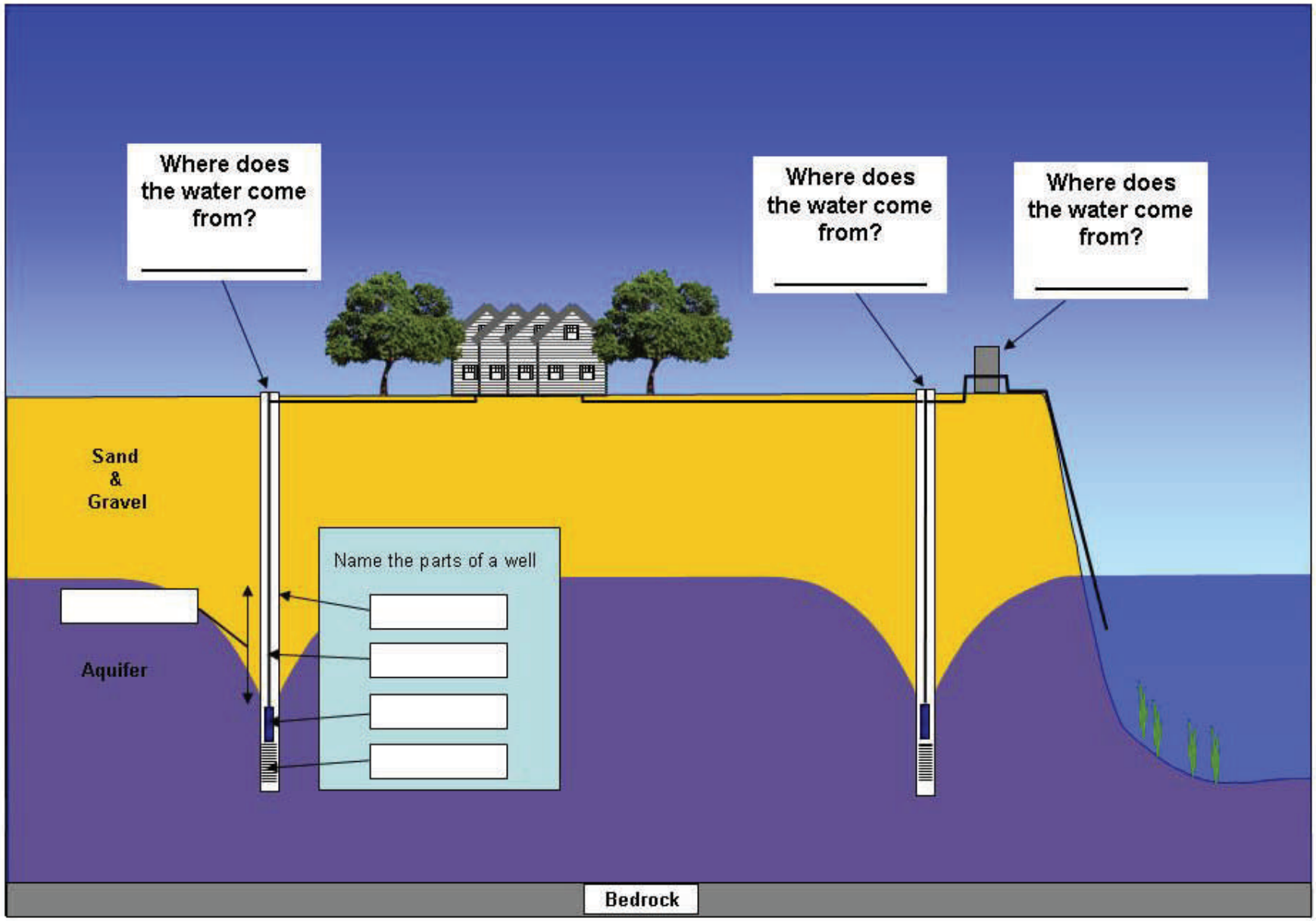
The finished well will look something like that in the figure above.

Wells pump water from the nearest aquifer unless they are close to a river or lake. Then the well may pump water from both the aquifer and the river or lake. Sometimes wells are not used at all, and water is pumped directly out of a river or lake.

Exercises:

1. Download the drinking water animation at *www.deq.idaho.gov/Rathdrumprairieaquifer*.
2. On page 3 fill in all the blanks describing where water comes from and name the parts of a well. Draw arrows showing where the water is coming from.
3. Have your teacher contact the local water system operator and find out where your drinking water comes from. Arrange a visit to see a water well.

Idaho Department. of Environmental Quality:GRS:06/09


Where does the water come from?
Where does the water come from?
Where does the water come from?
Sand & Gravel
Name the parts of a well
Aquifer
Bedrock

Drinking Water

Where does my water come from?

4. Construct an aquifer by ;
    1. Place the two tubes into the beaker so the bottom of the tube is near the bottom of the beaker
    2. Place about 4-inches of gravel in the large beaker. This is your aquifer.
    3. Place a paper cup with a number of holes in the bottom or the bottom cut off so that it is a few inches into the gravel. The cup represents a lake or river.
    4. Pour enough water into the beaker so that the water is not quite to the top of the gravel but is filling the cup. Mark the water level on the beaker with crayon or non-permanent marker
    5. Connect syringes to the ends of the two tubes. These are water wells.

Start pulling water out of the gravel with one of the syringes. If you need to pull more than one syringe full then place into a separate beaker and save.

What happens to the water level in the beaker?
What happens to the water level in the lake or river?

Mark the final pumped water level in the beaker. Now pour all the water you pumped back into the beaker.

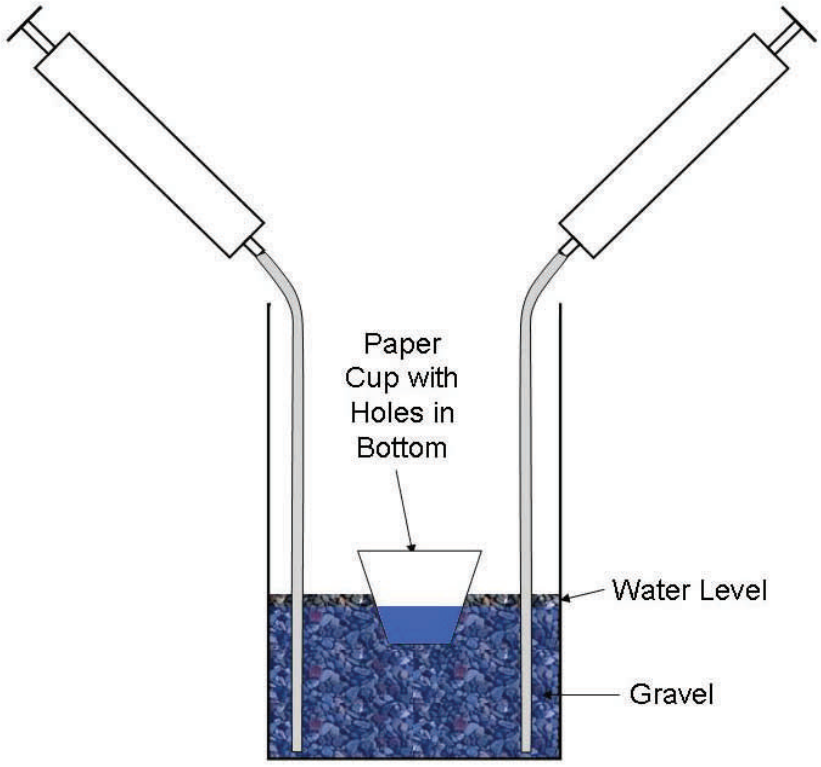
What would this represent?
What happens to the water levels?

Repeat the process above only use both syringe keeping the pumped water from each syringe separate.

What happens to the water level in the beaker?
What happens to the water level in the lake or river?

Mark the final pumped water level on the beaker. Now pour the water you pumped back into the beaker from only one syringe.

What would this represent?
What will happen to water levels if you keep pouring back only the water from one syringe?





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CERTIFICATE OF COMPLETION
AQUIFER EDUCATION



This Certificate is awarded to

School

In Recognition of Completing Lesson 3



Teacher

Date