

Mayonnaise Jar Aquifer Materials List

The goals of this unit, which contains four lessons, are to introduce the student to the following –

- How groundwater is stored in geologic materials composed of gravel and sand;
- How differences in porosity affect the quantity of available groundwater;
- How a water well works;
- How the rate of groundwater recharge affects the quantity of available groundwater;
- How contamination moves in groundwater towards a pumping well; and
- How to manage known or potential contamination sources in a wellhead protection area

Materials needed –

Plastic mayonnaise jar (either 30 to 32 fluid ounce capacity). Various brands of mayonnaise come in slightly different styles and capacities of plastic jar. Generally, jars that have ribs on the sides may be slightly easier to grip when wet than the ones without ribs.

Liquid measuring cup (2 to 4 cup size is recommended). Plastic kitchen measuring cups are available at a variety of stores that carry kitchenware although the stores that offer items for a dollar may be the least expensive places to shop. However, any type of graduated container for measuring liquid will suffice as long as it can hold at least 2 cups of water. Remember that the measuring cup will be used to hold gravel and sand in addition to liquid so there is opportunity for it to become scratched.

(3) Cups of clean gravel (potting gravel, driveway gravel, or landscape gravel). Home centers or hardware stores carry bags of gravel in their gardening departments or with cement/concrete materials. Generally, gravel that has particles the size of a pea to about one inch in diameter works best for loading into a mayonnaise jar. It is a good idea to rinse the gravel with water to remove dust or other fine particles prior to use.

(4) Cups of clean sand (sandbox or play sand). Home centers or hardware stores carry bags of sand in their gardening departments or in with cement/concrete materials. Avoid very fine sand like that used as the base beneath paver brick.

Large spoon (soup or serving size is recommended). The spoon will be used to load gravel or sand into the mayonnaise jar so it needs to be durable. A **scoop** also works well for placing gravel or sand in the jar.

(6 inch) Length of 1/2 inch diameter plastic electrical conduit or 1/2 inch plastic water pipe. Either comes in 5 and 10 foot lengths and is available at home centers or building supply/hardware stores. Sometimes, stores carry shorter lengths of these materials.

(1 foot) Length of 3/8 or 1/2 inch diameter polyethylene (PEX) tubing. The 3/8 inch PEX tubing fits inside the 1/2 inch electrical conduit and the 1/2 inch tubing fits inside the 1/2 inch water pipe. PEX tubing can be found in the plumbing supplies section at home centers and

hardware stores and comes in 5 and 10 foot lengths. The PEX tubing will be used to “pump” water from the mayonnaise jar. A soda straw will work although it will take much longer than using PEX tubing. Connecting a **soda straw** to a **kitchen baster** makes a very good pump and is faster although it makes an effective squirt gun.

Food coloring (red works best). Fifteen drops of red food coloring added to a cup of water will be used to simulate contamination in Lesson 3. You may wish to prepare this mixture ahead of time and store it to avoid mess in the classroom. A 6.3 ounce size **plastic peanut butter jar** holds at least 1 ½ cups of liquid and provides an inexpensive container for storing and later, pouring the food coloring mixture into the mayonnaise jar. Otherwise, a **paper or plastic cup of 12 ounce or larger capacity** can be used to prepare and pour the food coloring/water mixture.

Marker that won’t easily rub off wet plastic. Generally, the permanent type of marker ink works better in a wet environment than the dry eraser type and can be removed with the solvent used to remove stickers, labels, crayon, tar, gum, tape, etc.

Plastic ice cream pail or any wide-mouthed container that will hold at least 5 cups of liquid.