



PIPE GAME INSTRUCTIONS

(Recommended for grades 3 through 5)

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OBJECTIVE

To teach students how water gets from its sources to their homes, and the importance of conservation and eliminating waste.

RECOMMENDED AUDIENCE AND SETTING

This activity is best suited for elementary students in grades 2 through 5. Optimal group size is 12 to 20 students. Since getting a little wet is expected, this activity should be performed outdoors in a grassy field or inside a barn. It also requires an area at least 20-foot wide by 60-foot long.

MATERIALS NEEDED

- ▶ 3/4 inch diameter PVC pipe:
 - 5-foot sections (7)
 - 4-foot sections (5)
 - 3-foot sections (5)
 - 2-foot sections (5)
 - 1-foot sections (5)
 - 6-inch sections (2)
- ▶ 3/4 inch diameter PVC smooth x smooth couplings (18)
- ▶ 3/4 inch diameter PVC smooth x smooth 90 degree elbows (2)
- ▶ 5 gallon buckets (2)
- ▶ Large funnel (1)
- ▶ Large cup for dipping and pouring water (1)
- ▶ Access to water



Figure 1. (a) PVC pipe; (b) PVC coupling; (c) PVC 90 degree elbow.

TOOLS REQUIRED

(only needed for preparing pipe for first time played)

- ▶ Power drill with 1/8-inch drill bit (1)
- ▶ PVC pipe cutter or hacksaw

PREPARATION

- Step 1** Using the power drill and 1/8-inch drill bit, drill 3 to 4 few holes into two pieces of each section length—**except** for the 6-inch PVC pipe pieces (Fig. 1a). Drill one hole into three 3/4-inch PVC couplings (Fig. 1b). These pieces will serve as the “leaky pipe” in the constructed pipeline.
- Step 2** Attach one of the 90 degree PVC elbows (Fig. 1c) to one of the 6-inch pipe sections. Repeat for the second elbow and 6-inch pipe section. One assembly will be used to pour in the water to the pipeline, while the second assembly will be used to direct water as it discharges at the end of the pipeline.
- Step 3** Place all pipe and couplings together in a pile in a central area.
- Step 4** Fill one of the 5 gallon buckets with water. This will serve as the water source (e.g., reservoir or water well).
- Step 5** Position the full 5 gallon bucket and the empty 5 gallon bucket approximately 50 feet apart.
- Step 6** Place the funnel and dipping cup next to the full 5 gallon bucket.

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ACTIVITY

The goal of this activity is to teach students how water gets from its source to their homes. However, it can also provide valuable lessons in cooperation, planning, communication, and teamwork.

Time Required: Optimal time to complete this activity is 15 minutes.

First 5 minutes: Gather all of the youth. **Ask, “where does water we use in our home come from?”** Discuss the source(s) of water in the area—this may be a reservoir or groundwater. **Ask, “how does the water get from the reservoir or groundwater to our homes?”** If the source is groundwater, explain that a water well is used to pump water from an underground aquifer. Explain that water is transported in underground pipes to a treatment facility to filter out sediment and kill harmful organisms. Then, water is conveyed to water towers for storage. **Ask, “why are water towers so tall?”** They are elevated to create water pressure. Example: A 100-foot water tower will produce 43 psi (pounds per square inch) of pressure. This pressure “pushes” water through underground pipes to homes and businesses.

Explain that the group is going to build a pipeline from the reservoir or water well (full 5 gallon bucket) to the house (empty 5 gallon bucket) using the pipe and connectors in the pile. Ask for three volunteers. The first volunteer will pour the water from the reservoir or well into the pipe using the funnel. He or she will wait until the pipeline is constructed. The second volunteer will be positioned at the “house” (empty 5 gallon bucket) and ensure that water flows into the bucket. The third volunteer is responsible for detecting and replacing any leaking pipes and connectors.

Last 10 minutes: Direct the group to start building. Do not tell the youth that some pieces are leaky. When they have constructed the entire pipeline, the first volunteer can begin slowly pouring water into the pipe. Once the pipe begins to leak, the repair person is notified to fix the leak. All of the youth should be involved, either as a volunteer, constructing the pipeline, or holding up the pipeline. Once the pipeline is completed, **ask, “which way does water flow?”** The response should be “downhill.” This should remind the youth that for water to flow, the pipeline should slope from the reservoir or well to the house. When ready, all water is slowly poured into the funnel and allowed to flow to the house. Ask the youth to observe how much of the water in the full bucket made it to the house. **Ask, “where did the rest of the other water go?”** Explain how important it is to conserve water and eliminate waste.

KEY TERMS

- 1. PVC** – abbreviation for Poly Vinyl Chloride, is a common material for underground water pipes.
- 2. Reservoir** – a large, natural or artificial lake used as a community water supply.
- 3. Groundwater** – water held underground in the soil or in pores, and in crevices in rock, called aquifers.
- 4. Water well** – an excavation or structure created in the ground by digging, driving, or drilling to access water stored in aquifers.
- 5. Water tower** – an elevated water tank, whose height creates the pressure required to distribute the water through a pipe system.
- 6. Water pressure** – the force applied to the surface of water due to gravity and the weight of water. Water pressure determines how forcefully water flows out of faucets.