

Gravity-Fed Water Systems for Developing Communities Activity—Gravity Fed Water System Design Worksheet — Answer Key

Directions

This answer key is only for Part 1, as students answers will vary for the remaining parts of the worksheet.

Part 1: Conceptual (Day 1)

- 1.) Name the four system parameters that dictate water velocity and flow and must be considered when designing a gravity-fed water system.
 - a. **Difference In Elevation: For a gravity-fed water system to function, there must be a difference in elevation from where the water is captured to where the water is distributed.**
 - b. **Amount of Water that Needs to be Distributed: This would be based on the number of people in the town, and the amount water required for each person.**
 - c. **Pipe diameter**
 - d. **Pipe length**
- 2.) What typical problems do you think could result by not correctly addressing each of the design parameters in question #1?
 - a. **If there is no difference (high to low) in elevation from source water to the town, water will not flow.**
 - b. **If the design of the system does not consider the full demand of the town, well into the future even, the water system will not provide enough water.**
 - c. **A small diameter will only let a certain amount of water flow per second, and affect friction (i.e., small diameter, more friction, and vice versa). Therefore, if the diameter of the pipe is too small, *insufficient* (if any) water will flow.**
 - d. **The longer the pipe, the more friction will be present to slow down the flow. More friction = less flow.**
- 3.) What is sedimentation?

The process of removing sediments out of water by allowing gravity and time to pull the particles to the bottom of a tank.
- 4.) What is turbidity?

The cloudiness or darkness of a fluid caused by a large number of individual particles in the water that are generally invisible to the naked eye, similar to smoke in air.