
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.