



Water Ways to Go!

In some sewer systems, the same force of gravity that keeps our feet on the ground helps move wastewater lower and lower through the pipes that carry it to a treatment plant. In this activity, students will demonstrate how a gravity sewer system works by constructing their own pipeline from common household materials.

Fun Facts/Information:

- ALCOSAN uses gravity sewers to move wastewater from the communities in our service area to our wastewater treatment plant on the North Side of Pittsburgh.
- Underground pipes have a downward tilt to help gravity keep the wastewater flowing towards the treatment plant. Sometimes, ALCOSAN uses pumps to help move the wastewater in places where the pipes cannot be tilted to allow for gravitational force.
- Those pipes can bend, twist, and turn, as long as they keep the water moving.



Materials:

- Shoe box or cardboard box
- Straws, bendy preferred
- Floss picks
- Tape (Masking or electrical work best)
- Scissors
- Two large cups
- One small (Dixie-style) cup
- Small amount of clay

(cont'd)

Procedure:

1. Put your box on its side with the open top facing you. This will be the “underground” where you will build your sewer system.
2. Make a small hole, just big enough for a straw to fit through it, near the bottom of one of the large cups.
3. Take one straw and place it inside the hole, use clay to help seal the straw inside the cup while still allowing water to go through the straw.
4. Placing the cup above the box, bend your straw around the front edge of the box so it goes inside, or cut a hole into the box and push the straw through to the inside. (Optional: You can tape your cup down so it doesn't move!)
5. Begin to build your sewer system by pinching the end of another straw and placing it inside the open end of the first straw that you fed inside the box. Use a small amount of tape to help seal the straws together.
6. Connect the remaining straws to each other by repeating the steps in #5. You can use as many straws, bends and turns as you'd like, but remember that your pipes must tilt or turn downward for gravity to work!
7. Use floss picks inside the box to help hold the straws in place. You can tape or poke a hole in the box with the floss pick to hold them in place (see photo on the first page).
8. Finish towards the bottom of the box, making a hole and poking your last straw through the side of the box so that it will drain into the small cup. This cup represents the treatment plant at the end of your sewer system.
9. Now fill your second large cup with water and pour it slowly into the first cup to see if gravity pulls the water all the way through your sewer system to the small cup! (Make sure your box is on a surface that will not be damaged if water leaks from your straw sewer connections!)

Follow Up/Extension:

- How long of a straw pipeline can you make and still keep the water flowing all the way through the system?
- Can you use different materials to hold up your pipeline?