



JUNIOR SEABEE

UT - UTILITIESMEN



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Let It Flow

The Utilitiesmen of the Seabees are responsible for systems within buildings related to the flow of water and air. In your house, you have water running in the sink as well sewage flowing from your toilet, sink and bathtub. When there is a clog or other disruption in these systems, your parents might call a plumber. If there is a disruption in the system that the Seabees maintain, they call the Utilitiesmen. They also work on those systems that help heat or cool a building.

UT's are trained to build, troubleshoot and test systems that require either liquids, gases, or sometimes solids to flow. In our project plans, we will work with solids, in this case, a ball. We will be building a system to get a ball from one side of a table or desk to the other.

For this project, we will need the following:

- Empty toilet paper and/or paper towel rolls. If you have the roll from the inside of wrapping paper or another paper tube with a diameter of just over an inch, that will also work. You'll want enough to extend from one side of a table to the other, when placed end to end, and they can be a mix of different objects so long as the diameter is very similar
- A super ball or other rubber ball that will fit easily through the tube. A marble could also be used. If you have a variety of sizes and weights, you'll have more options for experimentation
- Tape – a wide tape works best because it is easier for kids to use in this instance, can be found at dollar stores – does not need to be duct tape
- Scissors (if the tape does not have a cutting mechanism)
- Blocks, cans or other items that can be used to alter the angle of the tube to adjust the flow
- Optional hair dryer or SMALL electric fan to improve flow
- Optional shatterproof bowl or bucket to catch your flow

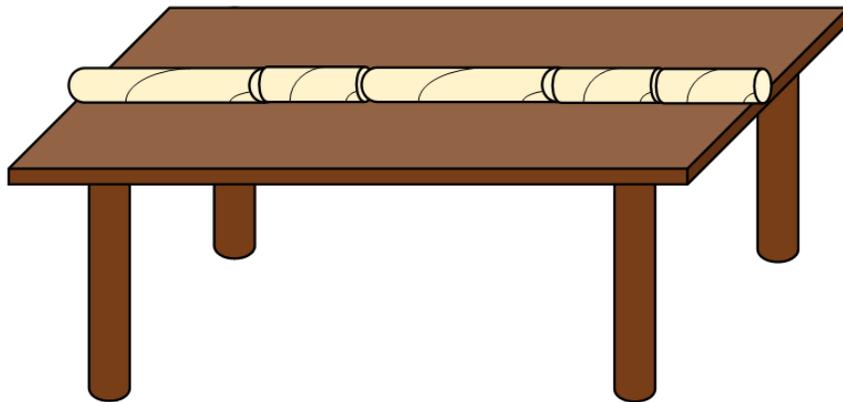
JUNIOR SEABEES CAN DO TOO!



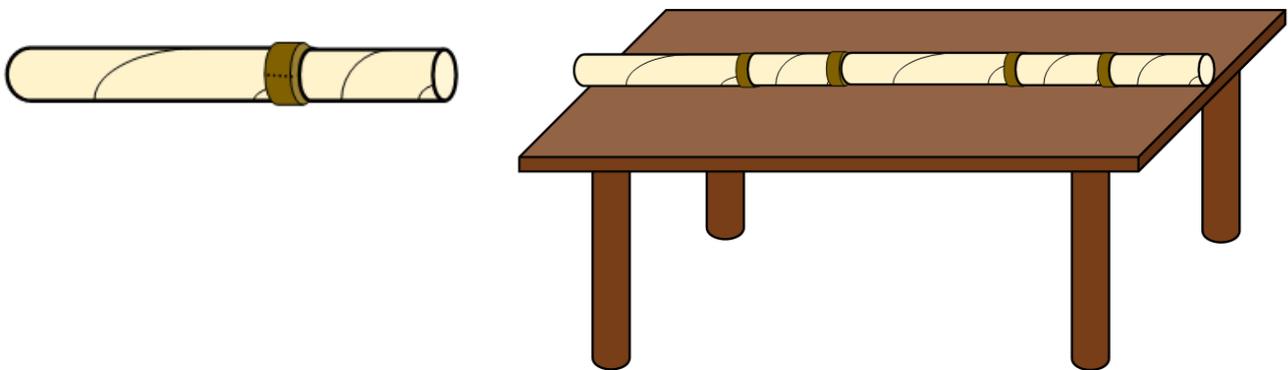
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Seabees are often asked to create systems to move materials from one place to another. In this program, we will try to move a ball or marble from one side of the table to the other. The ball, in this instance could represent water, air, or a solid.

1) Line up your tubes end-to-end stretching from one side of the table to the other.



2) Begin taping your tubes end to end, wrapping the tape around the tube. The tape will serve as couplings for our pipes. Continue until all of the tubes are connected and lay it back flat on the table



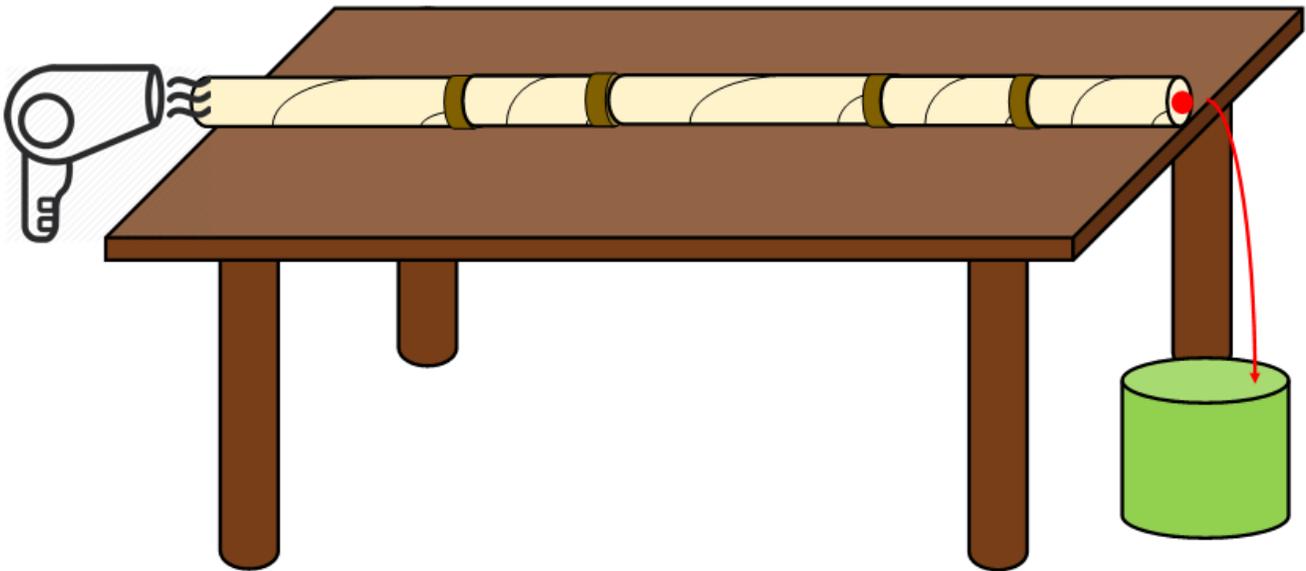
3) Place the ball at one end of the tube and *without moving the flat tube*, see if your ball will make it to the end of the table. If it doesn't, what do you think you can do to fix it, so the ball will roll?

4) Try the following optional activities to see if it improves your luck:

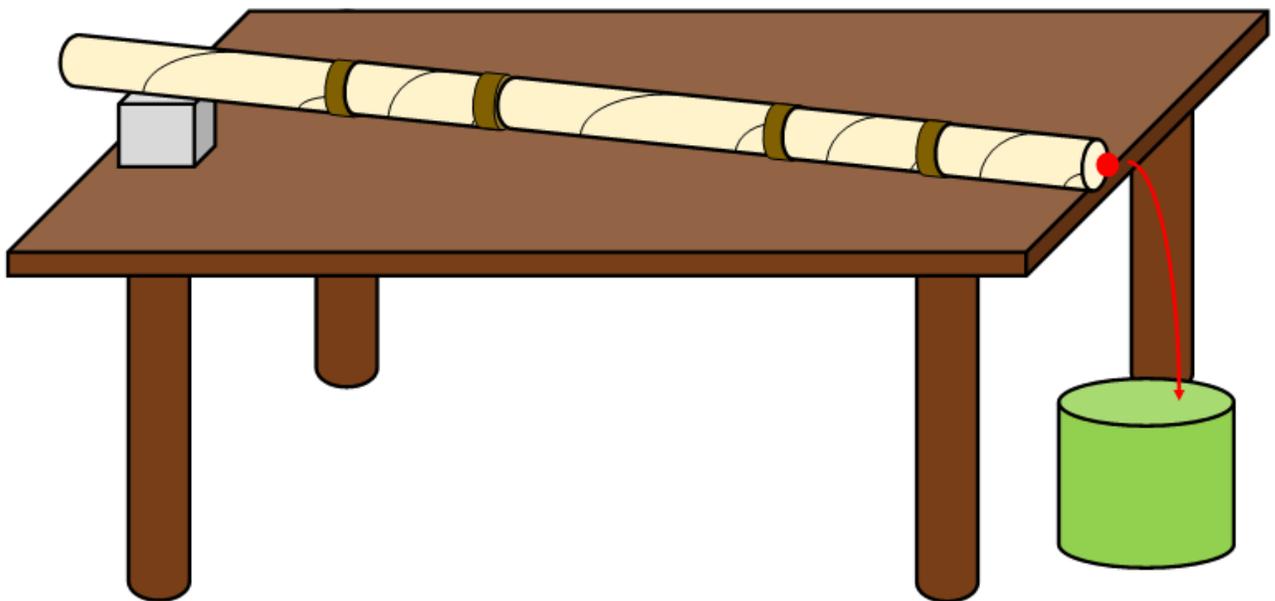


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1. If you have a hair dryer or small electric fan, *carefully* place it at the side of the tube and turn it on. Did the ball make it out of the tube? Was there enough pressure?



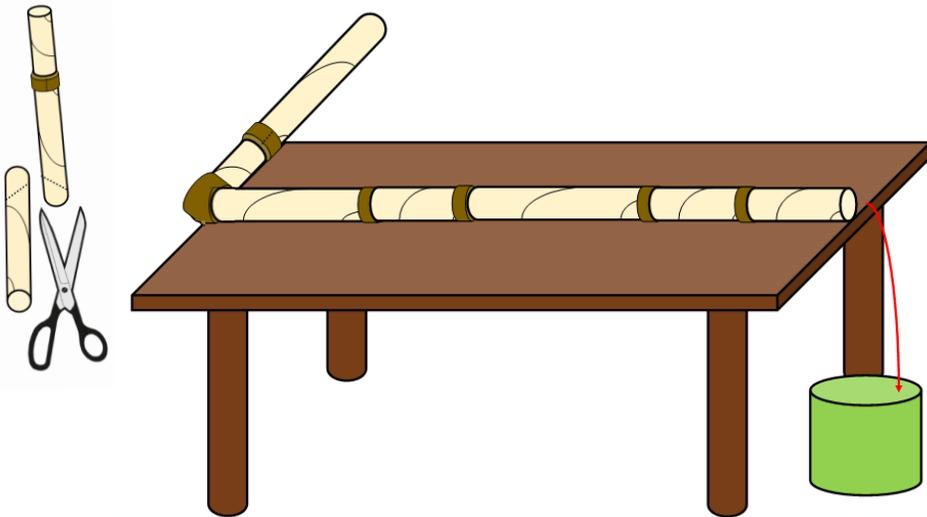
2. Insert blocks or a can or other structure under one end of the tube. Does the ball roll through now?





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- 5) When Seabees create systems that allow liquids or solids to travel through, they must take this angle into account and ensure that the pipe is not flat, so that the material continues to move.
- 6) As an add-on activity, try cutting the end of one of the tubes at an angle and building a system that has curves or turns in the flow by taping the tubes at an angle. How does an angle effect the flow of material?



- 6) Clean-up is always the last part of anything we do! Your cardboard tubes should be recyclable, so take off the tape and throw it away while you recycle the cardboard.
- 7) Please remember to post pictures or videos of your experiments on social media using #JuniorSeabee and #USNSeabeeMuseum so the world can see what you've learned. Share your creations on our Instagram or Facebook pages – tag us at **U.S. Navy Seabee Museum** and don't forget to follow us!