

# PIPELINE CHALLENGE

Get your students ready for the Science Alive! **STEM Day Out Pipeline Challenge**. This is an opportunity for your students to test their engineering skills as build their own pipeline to transport a golf ball or a ping pong ball across the purpose-built pipeline arena.

## At school activity

The purpose of this activity is to give students the opportunity to practice their pipeline design techniques. They can do this by using design and engineering processes. Design a pipeline, test the design, analyse the results, make improvements and testing again.

This activity focuses on how engineers develop pipeline systems to transport water over very long distances.

- Students work in teams to develop a pipeline system to transport both a golf ball and ping pong ball across the classroom terrain.
- They will need to incorporate four angles into their design, one of which is a right angle (90 degrees). The difference in height from one end of your pipe to the other can be no more than 45cm.
- Test the pipeline designs by first rolling the golf ball through and then, the ping pong ball until each one stops. Students should measure and document how far each ball rolled until it stopped.

## Objectives:

- Work collaboratively in a group to design, create and test a pipeline.
- Encourage creativity, critical thinking and problem solving
- Apply science inquiry skills
- Innovate (design, build and evolve your own unique solution.
- Develop an understanding of position and motion of objects
- Develop an understanding of science as a human endeavour

## What you will need:

- 6m of piping per team
- Paper towel, wrapping paper and toilet paper rolls (or roll up thin sheets of cardboard) – Tubes must be large enough to accommodate a golf ball and ping pong ball.
- To minimize the issue of balls becoming stuck in the tubes, consider cutting the tubes in half to serve as “open” piping.
- Packing or duct tape for connections
- PVC tubing, if budget allows
- Golf ball (or similarly sized rubber ball) Ping pong ball

## Teacher materials:

- This activity is adapted from the Try Engineering Pipeline Challenge <https://tryengineering.org/teacher/pipeline-challenge/#etc>
- In this online resource the science and mathematics of the activity are explored, a student worksheet is provided and links to science as a human endeavour are highlighted.

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## Curriculum Links:

### Science

#### Science Understanding - Year 7 Physical sciences

Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object

#### Science Understanding - Year 8 Physical sciences

Energy appears in different forms, including movement (kinetic energy), heat and potential energy, and energy transformations and transfers cause change within system

#### Science Inquiry Skills - Years 7-9

- Planning and conducting
- Processing and analysing data and information
- Evaluating
- Communicating

#### Science as a Human Endeavour - Years 7-9

- Use and Influence of Science

### Design and Technologies

#### Processes and Production Skills - Years 7-9