



**EXTREME STEAM SCIENCE KIDS  
ROBOTICS PROGRAM  
FOR CODE & GO**

**ACTIVITY – 14**

***This class will cover the following topics***

Understanding the design process  
Understanding how to use PVC pipes and connectors

***Materials needed***

12 – 10 foot lengths of 1” PVC pipes cut into the following:

20 - 2 foot pieces  
20 - 1 ½ foot pieces  
50 - 1 foot pieces  
20 – 1” Tees  
60 – 1” elbows  
20 – 1” couplings  
Rubber Mallet or channel lock pliers

This lesson involves a review of what a maze is and the different components that make up a maze. There are straight parts, left turns and right turns. Have a discussion with the boys and girls about mazes and what will be involved in navigating them. These mazes will help children practice programming their robot mouse as well as engineering a maze. We recommend using PVC pipe as one of the materials because it is easy to work with and very child friendly. The children can easily put together different pieces of the PVC with the different size lengths and the elbows, tees and couplings. However, any materials can be used to make a maze as will be discussed in Lesson 15.

The PVC pipe can be purchased at your local hardware store or any Home Depot or Lowes. We recommend using 1" PVC along with 1" elbows, couplings and tees to connect the different pieces that will make your mazes. All PVC should be schedule 40 which is the white standard that is found in the plumbing department of Home Depot or Lowes.

In order to properly execute this lesson you will need all of the materials listed above. The mazes are based on a width of 12 inches and can be copied from the maze blueprints that are part of this lesson or original designs engineered by the children.

It is suggested that all PVC pipe be cut before your program begins. Make sure to have someone who is knowledgeable in cutting this material. Once cut, make sure all ends are smooth. If necessary, use sandpaper or a file to smooth the rough edges. **CAMPERS SHOULD NOT BE THE ONES TO CUT OR SAND THE PVC PIPE!!!!** The material list for each maze configuration is listed below each maze diagram. When assembling the PVC pipe into mazes make sure not to push into connectors too tightly. Use your rubber mallet or pliers to disconnect the pieces from the connectors if necessary.

Once each group programs their mouse robot to navigate their maze they should rotate and try each group's maze.