

## Teacher Lesson 6: Taking Tuff-Bot on an Outing

Have you tried taking Tuff-Bot outside? It was designed to be used outdoors, traveling on dirt and grass, up and down uneven ground, even into places that people couldn't go.

It's time to see what Tuff-Bot can do outdoors!

Take this time to get ready for *Student Activity 6-A: Play Mini-Golf with Tuff-Bot*. Students will dig small hole and try to code Tuff-Bot to push a ball from its location into the hole. You can try various types and sizes of balls, but ping pong balls seem to work the best. (Golf balls are too heavy, and 2.5" "Squeezie" balls are too large and tend to get stuck under Tuff-Bot.)



### Testing Inside:

If you are testing inside with Tuff-Bot pushing a ball like a ping pong ball on a flat floor, when Tuff-Bot moves, the ball will roll much faster than Tuff-Bot can move. It is an interesting challenge to code Tuff-Bot to get to the ping pong ball and then move it toward its target.

### Testing Outdoors:

If you are testing outside with Tuff-Bot pushing a ball, the ball will likely stay right next to Tuff-Bot and not go farther away with each step that Tuff-Bot takes. There is a chance that Tuff-Bot can roll on top of a small ball on uneven ground, so watch out for that. You may need to move Tuff-Bot and the ball to a different starting position.

This Tuff-Bot successfully pushed a yellow ping pong ball into a hole in the dirt and then continued on.



*Student Activity 6-B: Tuff-Bot Hide and Seek* is a game that can be done inside or outdoors, depending on your environment. See what your students come up with!