

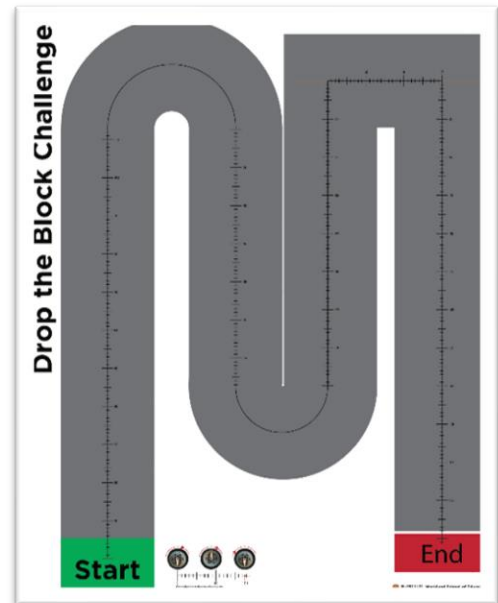
Drop a Block

Instructions for Students

Your task is to design a robot that can carry a block from the START position to the END position and drop the block.

Challenge Scoring Guide:

- 20 points for carrying the block to the right place
- 20 points for dropping the block on the STOP rectangle
- 20 points for staying within the lines



Materials Needed

- **Vinyl Mat.** We suggest printing a high-resolution copy of the mat, using a 4ft by 5ft format. It will cost approximately CAD 200 to print on smooth vinyl at a local print shop.
 - Please find [a copy in standard resolution HERE](#) (0.5 MB),
 - and [a high-resolution copy is available for download HERE](#) (7.1 MB).
 You may also need some tape to fixate the mat to the floor.
- Basic **EV3 Mindstorms Robot** built from the instruction manual
- An **attached arm** or lever designed and built with the small motor. This arm will need to be able to carry and drop an object.
- An **object** for carrying (e.g., a block).

Key Understandings

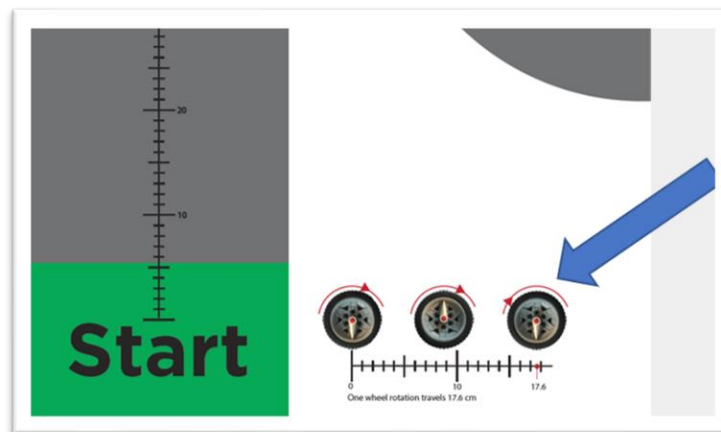
- Relates the length of straight segments to wheel rotations by estimating measurement and movement
- Relates the size of radius of the turning curve to the steering setting of the <Move> Block
- Relates the distance the robot travels along a curve to the number of wheel rotations by estimating measurements and movement

- Translates measurements into programming code to move a robot a specific distance and move along a curve
- Relates the small motor turns to the angle of the arm rotation

Note for Teachers

When creating the program and testing it, it is essential to line up the robot at the exact same location at the START position. Otherwise, it will travel off the path.

The ruler markings are to help children make connections to the distance traveled by the robot. There is a scale with the ratio of 1 wheel rotation: 17.6 cm on the mat.



Hopefully, the students will be able to use this proportion to start predicting how far each of the straight segments are. For example, if they mark the distance for one wheel rotation with their fingers, they can count how many times that distance is in the segment.

Also, they need to program 4 turns to complete the mat: a 25% steering, a 30% steering and two 100% steering. This is to help children gain experience with varying the tightness of turns.

For help on how the move steering works, use the [Move Steering Task](#).