

## Make It Move and Display Speed

**Design, build and program a robot that can move itself and calculate and display its average speed.**

### Connect

#### Design Brief

Design, build and program a robot that can move itself and calculate and display its average speed.

#### Brainstorm

Discuss different solutions to the design brief.

Think about:

How is speed measured?

How will you program the robot to calculate speed?

- How does the robot know the distance it moves?
- How does the robot know the amount of time it moves?
- In which units will you measure distance? (Answers might include motor rotations, centimeters or kilometers.)
- In which units will you measure the time traveled? (Answers might include milliseconds, seconds or hours.)

#### Select the Best Solution

Describe the solution that you have agreed to build and program.

Think about examples from your brainstorming discussion. Then explain why you chose this solution for the design brief.

### Construct

#### Build and Program

Now you are ready to start building and programming your solution!

As you work on your solution:

1. Describe one part of your design that worked especially well.
2. Describe one design change that you had to make.
3. What will you try next?

As you test your design solution, use the table for recording your findings.

## **Contemplate**

### **Test and Analyze**

How well does your solution satisfy the design brief? Record your data. Name the columns and rows, such as Trial Number, Distance, Elapsed Time, Average Speed, and Observations.

### **Review and Revise**

Take a moment to reflect on your robot solution.

Think about:

- Does the robot calculate speed accurately?
- How do you know?
- What are some ways that others have solved the problem?

Describe two ways you could improve your robot.

## **Continue**

### **Communicate**

Here are some ideas:

- Create a video of your project, especially your final presentation and your robot's performance.
- Explain some important features of your software program.
- Produce a building guide for your model by taking a series of photographs as you deconstruct it.
- Include an image of your program with comments.
- Add a team photograph!

**Congratulations! What will you design next?**