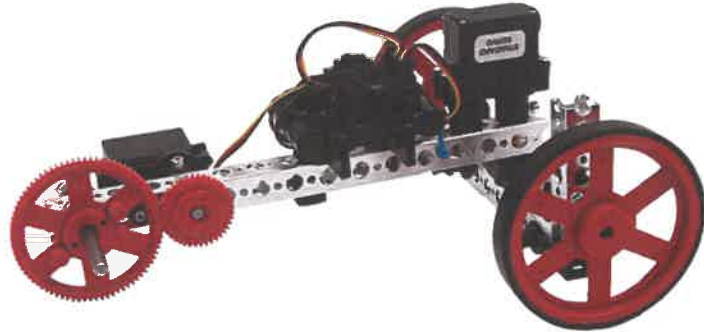# Activity 2 – Changing Speed

Vocabulary
- drive gear
- driven gear
- elapsed time
- idler gear
- mean time
- spur gear

Materials
- TETRIX PRIME Starter Set
- Painter's tape
- Stopwatch
- "Changing Speed Data Sheet"

Objective
Learn how gear ratio affects the speed of a robot.

Procedure

1. If you have not already done so, follow the instructions in the *Builder's Guide* to assemble the Wheelee Bot robot.

2. Review the Gears Resource Page in the back of this book.

3. Locate the two-meter distance your instructor has marked on the floor. If this has not been provided for you, use painter's tape to mark a distance of two meters on the floor.

4. Drive the robot the two meters and record the time in the table on the "Changing Speed Data Sheet" from the logbook.

5. Use the mean time to determine the average speed of the robot. Use the formula speed equals distance divided by time, or s = d/t.

6. Remove the servo and place a large gear on the axle with the wheel. Add a small gear to the servo and relocate the servo to mesh the gears (see figure 1). You now have a gear drive robot.

7. Repeat the timing procedure and record the time in the table on the "Changing Speed Data Sheet."

8. Determine the average speed of the robot. Remember s = d/t.

9. Switch the position of the gears by placing the larger gear on the servo and the smaller gear on the wheel axle (see figure 2).

10. Repeat the timing procedure and record the time in the table on the "Changing Speed Data Sheet."

11. Determine the average speed of the robot.

12. Complete the "Changing Speed Data Sheet."

13. You will use the same robot for the next activity, so store the robot carefully in the location provided by your instructor.
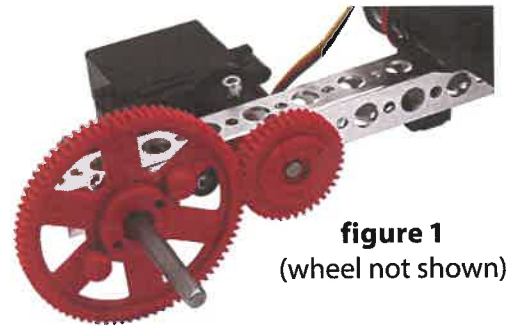
figure 1
(wheel not shown)

figure 2
(wheel not shown)