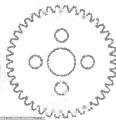# Activity 3 – Gear Ratio

Vocabulary

- gear increaser
- gear ratio
- gear reduction

Materials

- TETRIX PRIME Starter Set
- Painter's tape
- Gears Resource Page
- "Gear Ratio Data Sheet"

Objective

You will learn how gear ratio affects the number of rotations of the servo required to travel a distance.

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 information on the "Gears Resource Page."
3. Locate the two-meter distance marked by your instructor for this activity. If this has not been done, obtain permission to use painter's tape to mark a distance of two meters on the floor.
4. One student should be the driver and one student the recorder. The driver should slowly drive the robot the two meters while the recorder counts the number of times the servo shaft rotates. Record this number on the "Gear Ratio Data Sheet."
5. The driver and the recorder should change duties. The driver should slowly drive the robot the two meters while the recorder counts the number of times the axle on the wheel rotates. Record this number on the "Gear Ratio Data Sheet."

figure 3

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. You will now have a gear drive robot. (figure 3)
7. The driver should slowly drive the robot the two meters while the recorder counts the number of times the servo shaft rotates. Record this number on the "Gear Ratio Data Sheet."
8. The driver and the recorder should exchange duties. The driver should slowly drive the robot the two meters while the recorder counts the number of times the axle on the wheel rotates. Record this number on the "Gear Ratio Data Sheet."
9. Exchange the position of the gears by placing the larger gear on the servo and the smaller gear on the wheel axle. (figure 4)

figure 4

10. The driver should slowly drive the robot the two meters while the recorder counts the number of times the servo shaft rotates. Record this number on the "Gear Ratio Data Sheet."
11. The driver and the recorder should change duties. The driver should slowly drive the robot the two meters while the recorder counts the number of times the axle on the wheel rotates. Record this number on the "Gear Ratio Data Sheet."