

**Teacher's Guide**  
**Activity Four**  
**Exploring An Idler Gear**

**Concept**

An gear located between two other gears is called an idler. Turning this gear causes the followers to turn in the same direction. The follower gears need not be the same size. The idler gear can be any size.

**Investigation**

There are times in the construction of machines that two gears will need to be turned in the opposite directions from one source of force. This and two gear structure is a means of accomplishing this.

Students might also alter the construction by having the idler axle inserted from the opposite direction. The idea of alternate construction is important because design modifications is often the way new and improved machines are made.

**Lego Dacta Parts List**

- one eight tooth wheel gear
- three 8-stud long axles
- three bushings
- one 8-stud beam
- two 24 tooth wheel gear



**Directions**

1. Assemble the gear wheels as pictured in figure to the right.
2. Turn the axle on the idler gear and record your observations.
3. Record student observations.
4. Now, turn one of the large gears and notice what happens to the other large tooth gear. Record your observations.

**Possible student responses**

1. both big wheel gears turn in the small direction
2. both big wheel gears turn at the same speed

This activity can be modified several ways to explore the concepts behind the use of idler gears and gear combinations. Changing the size of one gear on the triplet construction will allow students to explore gearing concepts related to gearing-up and gearing-down when an idler gear is being used. This exploration can be done using prediction and testing and will give students opportunity to apply the scientific method and the process approach to construction and problem solving.

