



Gears, Gears, Gears

A Lesson in the Motion and Rotation of Simple Gears

Gears #2 (G1241J)

Science Concepts

Gears are wheels with teeth around the outer edge. When the teeth of two gears mesh, movement of one gear will cause the other gear to turn. One of the basic relationships for the movement of gears is the number of teeth, the diameter of the wheel and the speed at which the gears move.

Question

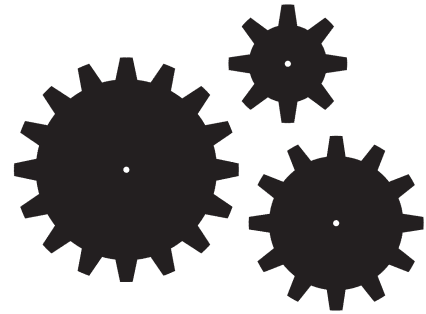
How does the size of a gear and the number of teeth affect the rate and direction of rotation?

Procedures

1. Using the AccuCut[®] MARK 5[™] machine and the Gears #2 die, cut several sizes of gears from cardboard, matboard or foam core.
2. Provide teams of students these different combinations of gears.
3. Use a flat piece of cardboard as a base for testing the gear combinations.
4. Place different combinations of gears on the cardboard base making sure that the teeth fit together.
5. Secure the gears to the base by poking a small brad through the center of each gear and into the cardboard base. Make sure that the gears will rotate freely.
6. Rotate the gears and determine the number of times that the smaller gear turns in relationship to the larger gear. Record your observations in a data log.
7. Try several different gear combinations. What happens if you use two gears of the same size?
8. Can you change the direction that the gears rotate?

Extensions

- Constant questioning as the students test the gear combinations will lead to conclusions regarding the relationships between diameter, number of teeth, and the rotary speed of the gears.
- Look around the house for examples of gears used in household gadgets. Check around the workshop. Check out the gears on a bicycle.



Gears #2
(G1241J)

