

“Be a Biomedical Engineer”¹

Job Task:

You are a biomedical engineer, an engineer who solves problems in medicine, such as creating replacement body parts, drug-delivery systems, medical instruments, and test equipment. Their work helps restore health and function and improves the quality of life for people who are sick or injured. Biomedical engineers need to have a good understanding of physics. Your job is to investigate the relationship between force, mass, and motion.

Time Frame: 1-2 hours

Materials:

- A small marble
- A large marble
- Masking tape
- Ruler
- Paper
- Pencil

Procedure:

Set-Up:

1. On a desk or table, put down a 12-inch piece of masking tape.

Part 1:

1. Place the small marble at one end of the tape, and the large marble at the other.
2. Roll the small marble so that it collides with the large marble.
3. With the ruler, measure the distance in inches that the large marble traveled AFTER the collision. Record the results on your piece of paper.
4. Repeat two more times.

Part 2:

1. Place the small marble at one end of the tape, and the large marble at the other.
2. Roll the large marble so that it collides with the small marble. Note, try to roll the marble with the same force you used in Part 1.
3. With the ruler, measure the distance in inches that the small marble traveled AFTER the collision. Record the results on your piece of paper.
4. Repeat two more times.

Part 3:

1. After completing the investigation, think about the following questions:
 - a. In which investigation did the marble travel farthest?
 - b. Why do you think this happened?
 - c. How can you show that mass has anything to do with how far the marbles travel?
 - d. Did the force of your roll have a possible effect?

¹ Adapted from <https://milford.lib.de.us/2020/09/28/stem-heavy-or-light-ball/>