

Topics: Laws of Motion,
Action-Reaction, Angles,
Dexterity Games

Materials List

- ✓ Marbles (4 per player)
- ✓ Shooter marble (1 per player)
- ✓ Marked circle (e.g. – drawn with chalk on sidewalk)
- ✓ “Target object” (e.g. - a paper cup)

This activity can be used to support the teaching of:

- Forces & Motion (Next Generation Science Standards: Grade K, Physical Science 2-1, 2-2; Grade 3, Physical Science 2-1, 2-2; Middle School, Physical Science 2-2)

Bulls-Eye!

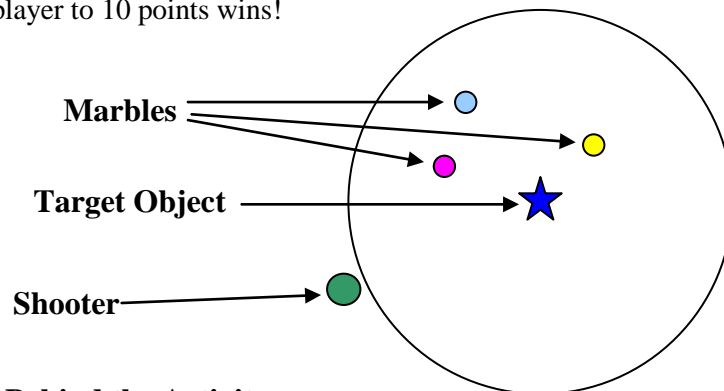
A Marble and Target Game



Simple marble games can be a great introduction to the study of motion – or just a great way to spend an afternoon!

Playing the Game (for 2-6 players)

1. Draw a circle of at least 2 meters (~6 feet) in diameter (the circle can be larger, depending on the amount of available space).
2. Place a target object, such as a paper cup, in the center of the circle.
3. Each player places their four marbles between six and twelve inches from the target object, in any direction (see diagram).
4. In turn, players kneel outside of the circle and use their shooter marbles to knock the other marbles into the target object.
5. To shoot, a player holds the shooter marble in her hand and flicks it with her thumb (Note: younger players can roll the shooter like a bowling ball). Players should reclaim their shooter after every turn. When shooting, the player’s entire body must remain outside the circle.
6. Each time a player knocks a marble into the target object he receives one point.
7. The first player to 10 points wins!



The Science Behind the Activity

This classic marble game is not only fun and easy, but also teaches kids about motion, forces and angles. Students must figure out how to put a stationary object into motion using the right amount of force and the correct angle to hit the target. This is a practical and easy to understand demonstration of Newton’s laws of motion:

- 1) Objects in a uniform state of motion tend to remain in that state of motion until an external force is applied (i.e. - inertia)
- 2) Force = Mass x Acceleration and
- 3) For every action, there is an equal and opposite reaction.

Web Resources (Visit www.raft.net/raft-idea?isid=16 for more resources!)

Information on the history of marbles and link to more marble games can be found at:

- Rules for marble games - <http://www.landofmarbles.com/marbles-play.html>
- World Marbles Federation - <http://www.worldmarblesfederation.com/>