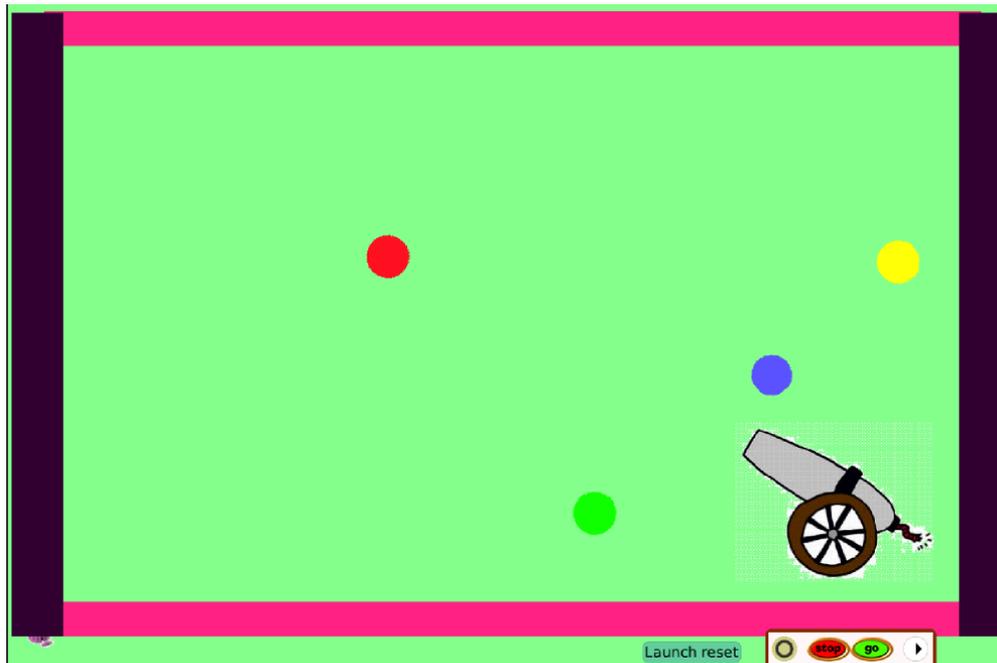


Bouncing Ball Machine

Challenge:

Create a machine that contains a launching device, such as a cannon, that launches different colored balls. The machine should contain a reset button to select before the machine runs. The balls should bounce off of the sides of the playing field and continue bouncing until the stop button is selected.



Things you'll need to know:

- Creating objects
- How to hide objects
- Understanding the concept of angles for creating bouncing of balls when sides are hit.

- How to create buttons for control

Things to think about

- Will all balls come out of the cannon at the same time?
- Will the result of the balls hitting the top, bottom, or sides of the field behave the same or differently?
- Will the speed of the balls all be the same or different.
- How is the machine stopped or started?
- Is a reset necessary?

Extensions

- Have each ball launch at a different times by depending in the color of the ball have different actions when hitting the sides, bottom, or top.
- Have the user be able to add balls.
- Have the cannon move to different angles before launching.
- Randoming launching balls.

Making a Bouncing Ball Machine

Created by Jane McCormick

Step 1: Create the play field

1. Click on Make a Project to open up a new project.
2. Create an enclosed area.
 - a. Select the Paint Palette
 - b. Select the rectangle and draw a border for either a side or the bottom or top.
 - c. Repeat step a until each side, bottom and top has a rectangle. You should now have an enclosed box. Make the sides the same color and the bottom and top the same color.
3. Find a cannon or launching device to use and insert into the enclosed area.
4. Create 4 balls each a different color:
 - a. Select the Paint Palette (medium) brush size.
 - b. Select the color you would like.
 - c. Hold down the shift key while drawing a ball.
 - d. Repeat steps 3a-3c for each ball you would like changing the color each time.
5. Create a reset script to reset the ball position of each ball to the middle of the cannon.
 - a. (Hint - move a ball to where you would like it and check the x and y coordinates in the scripting area for the ball).
 - b. The reset script should contain two assignment statements for each ball with the values from step 5a. If 3 balls then 6 assignment statements.
6. Create a script for each ball to control the behavior of the balls.
 - a. Consider using a forward command to control movement.
 - b. Consider using a test for hitting the sides of the field and a test for hitting the top or bottom.
 - c. When a ball hits the enclosure consider having different behavior when bouncing off. You may want to consider using the header command and subtracting the current position from 180.

7. **Create a Start / Stop button for machine.**
 - a. **Look into the Supplies box**
 - b. **You may want to delete the step option.**
8. **Now play by selecting the reset followed by the start button.**