

M2.1 Cotton Ball Catapult Lab

Catapults use projectile motion to launch objects. In this lab, you will build a simple catapult and determine the angle at which the catapult will launch an object the farthest.

MATERIALS

- cotton ball (2)
- meter stick (or) measuring tape
- protractor
- spoon, plastic
- tape, duct
- wood block

SAFETY INFORMATION

Using Scientific Methods

ASK A QUESTION

1. At what angle, from 10° to 90° , will a catapult launch a cotton ball the farthest?

FORM A HYPOTHESIS

2. Write a hypothesis that is a possible answer to your question.

TEST THE HYPOTHESIS

3. Using duct tape, attach the plastic spoon to the side of the block. Use enough tape to attach the spoon securely.
4. Line up the bottom corner of the block with the bottom center of the protractor. Start at 10° .
5. Place a cotton ball in the spoon, on top of the taped cotton ball. Pull the spoon back lightly and let go. Measure and record the distance from the catapult that the cotton ball lands. Repeat the measurement and calculate an average.
6. Repeat step 7 for each angle up to 90° .

DATA TABLE:

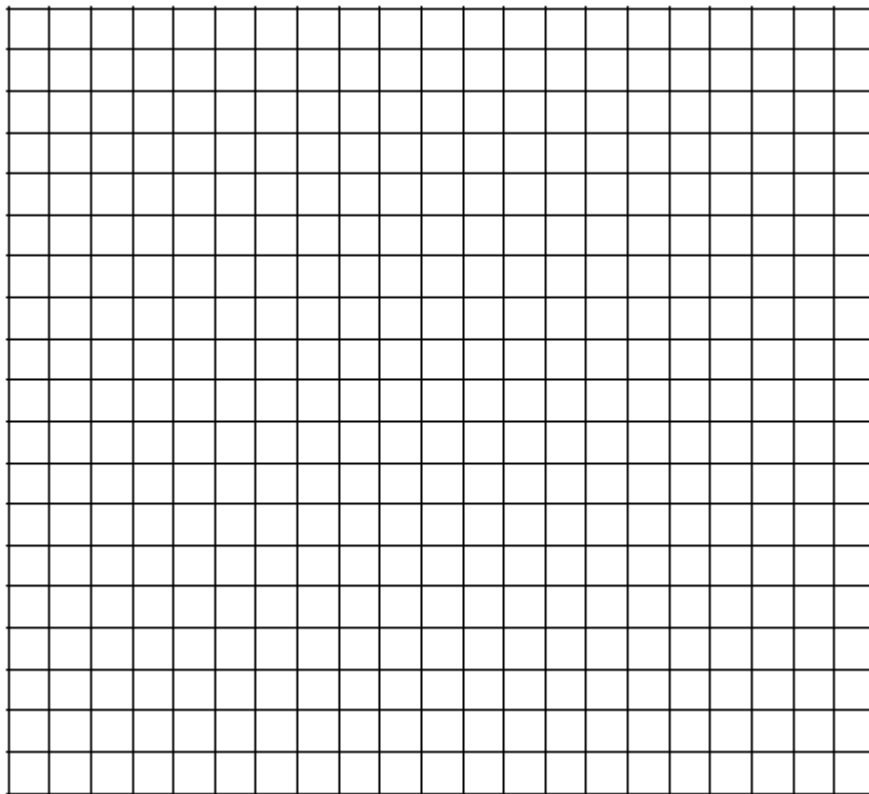
Angle (x)	Distance 1 (cm)	Distance 2 (cm)	Average distance (y)
10°			
20°			
30°			
40°			
50°			
60°			
70°			
80°			
90°			

GRAPH

Create a line graph with 1 line (line and plots are the same color) of your results using all of the rules for graphing!

Title: _____

Y-axis Label:



X-axis Label: _____

- TOPER Checklist:**
- Title & label axis
 - Organize your data
 - Pencil
 - Even scale & spacing
 - Ruler

ANALYZE THE RESULTS

1. At what angle did the catapult launch the cotton ball the farthest? Explain any differences from your hypothesis.

DRAW CONCLUSIONS

2. At what angle should you throw a ball or shoot an arrow so that it will fly the farthest? Why? Support your answer with your data.

Cotton Ball Catapult

Teacher Notes

TIME REQUIRED

One or two 45-minute class periods

LAB RATINGS

Teacher Prep—2
Student Set-Up—1
Concept Level—2
Clean Up—1

Easy ← 1 2 3 4 → Hard



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MATERIALS

The materials listed are for each group of 1–3 students.

PREPARATION NOTES

Some ceilings may be too low and some classrooms too crowded for this lab. Move to the hallway or outdoors to give students plenty of room.