

Catapult Investigation Worksheet

Group Members: _____

Catapult Materials

- 1 spoon
- Rubber bands
- Popsicle sticks
- Small launch object
- Measuring tape or meter stick
- Protractor or angle guide
- Ruler
- Target circle

Part 1: Investigating Launch Distance

Problem

A catapult launches an object by storing and releasing energy.

The distance the object travels may depend on different variables.

In this investigation, you will test two possible variables that may affect launch distance:

1. **Spoon angle** (measured angle between base and spoon)
2. **Pull-back height** (measured height between table/base and spoon when pulled down to load)

You will collect data, look for patterns, and decide how to improve your catapult for maximum distance.

Investigation Questions

1. *How does the spoon angle affect the distance the object travels?*
2. *How does pull-back height affect the distance the object travels?*

Prediction 1: As the spoon angle changes the distance traveled will (be specific here)

Prediction 2: As the pull-back height changes the distance traveled will (be specific here)

Testing Spoon Angle:

Explore how the number of popsicle sticks affect distance. Measure and record the angle used for each launch.

Spoon Angle (degrees)	# of popsicle sticks for height	Trial 1 Distance	Trial 2 Distance	Trial 3 Distance	Average Distance

Observations:

Testing Pull Back Height:

Keep the angle of the catapult the same for each trial. Only change the release height (pull back height). Measure and record for each launch.

# of popsicle sticks	Pull-Back Height (cm)	Trial 1 Distance	Trial 2 Distance	Trial 3 Distance	Average Distance

Observations:

Part 1 Summary Questions

1. Summarize Your Findings

What did your data show about how spoon angle and pull-back height affected launch distance?

2. Designing for Maximum Distance

Based on your findings, what changes would you make to create the maximum distance?

Part 2: Accuracy Challenge

Challenge

Now your goal is to launch the object into a target circle placed at a fixed distance.

Target distance: _____

Use what you learned about release angle and pull-back height to make your catapult as accurate as possible.

Accuracy Investigation Question

What combination of release angle and pull-back height helps your catapult land the object closest to the target?

Prediction:

• Release angle: _____

• Pull-back height: _____

Because _____.

Accuracy Testing

Trial	Spoon Angle (degrees)	Pull-Back Height (cm)	Landed Inside Circle?	Distance from Center of Target
1				
2				
3				

Accuracy Adjustments

Change Made	Why We Made This Change	Result

Accuracy Summary

What setup helped your team become most accurate?