

# Catapults!

Engineering the Future

Exploring the Scientific Method

Using Catapults



# Engineering the Future



- ▶ **Micron provides student-gearred programs to help students have hands-on experiences and see how STEM plays a role in everyday life.**

- All programs geared directly towards students

- Includes:

K-12 Student website

Chip Camp & other student programs

Career Awareness Resources

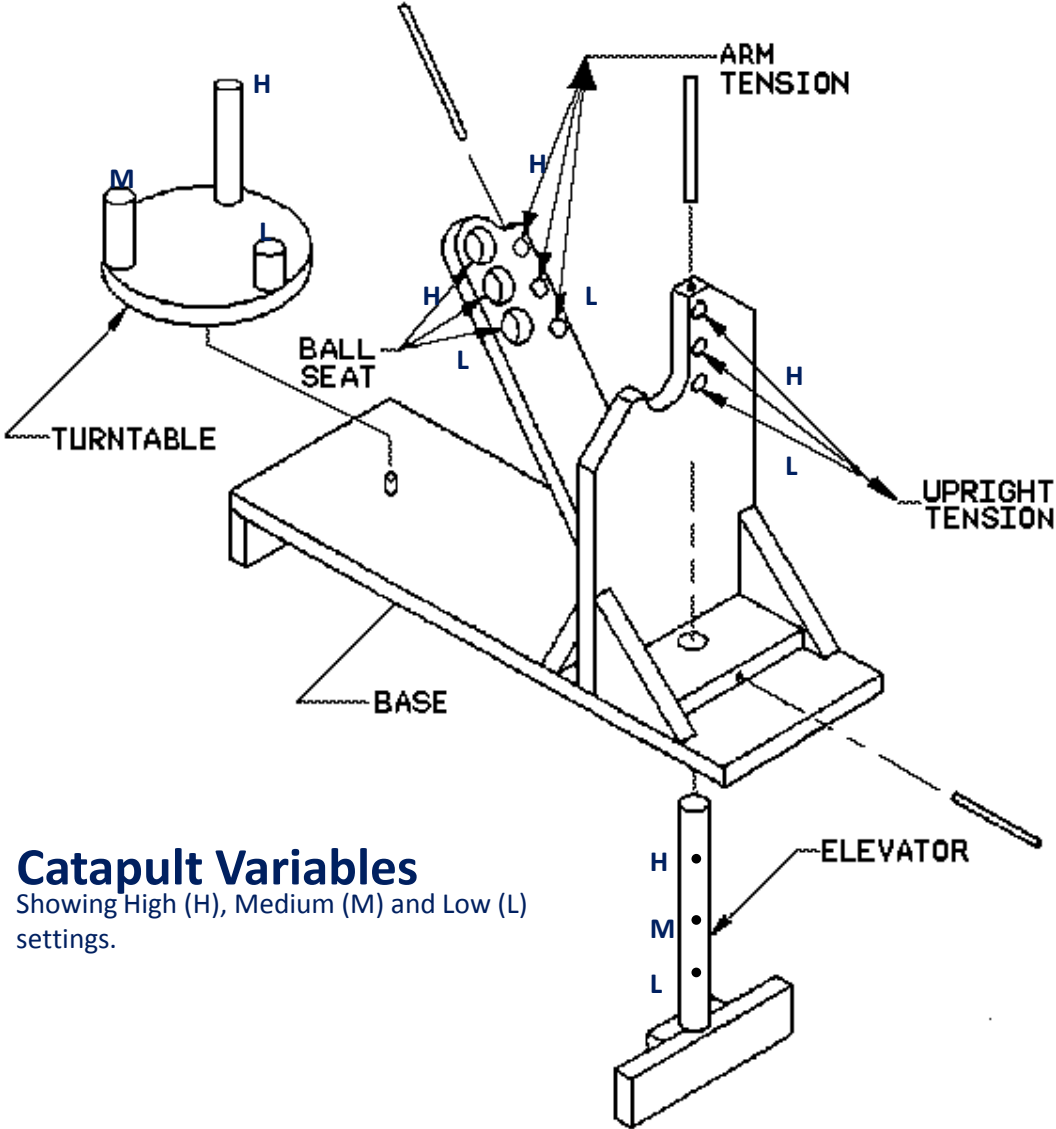
University Student Programs



# Scientific Method

- 1. State the Problem**
- 2. Research Your Topic**
- 3. Develop a Hypothesis**
- 4. Perform an Experiment**
- 5. Gather and Record Data**
- 6. Analyze Your Results**
- 7. Draw Conclusions**
- 8. Report Your Results and Conclusion**

# Catapult Variables



**Catapult Variables**  
Showing High (H), Medium (M) and Low (L) settings.

## Catapult Challenge

Form 1: Short Form; 3 factors, 2 variables

### Part One: Distance

**State the Problem:** \_\_\_\_\_

**Research the Topic:** Explore the use of the catapult and observe what happens when you change the variables. Take notes but do not collect data.

1. Elevator? \_\_\_\_\_
2. Ball Seat? \_\_\_\_\_
3. Turntable? \_\_\_\_\_

#### Hypothesis:

Select the High or Low setting for each factor that will solve the stated problem.

Elevator	Ball Seat	Turntable
HIGH	HIGH	HIGH
low	low	low

#### Perform an experiment:

Check the 5 options in the table below that you will use to evaluate your hypothesis.

#### Gather and record data:

Run each trial three times and record the distance in the appropriate box.

Option	Elevator	Ball Seat	Turntable	Distance Shot		
				1	2	3
1	HIGH	HIGH	HIGH			
2	HIGH	HIGH	low			
3	HIGH	low	HIGH			
4	HIGH	low	low			
5	low	HIGH	HIGH			
6	low	HIGH	low			
7	low	low	HIGH			
8	low	low	low			

#### Analyze the results:

Was your hypothesis correct? \_\_\_\_\_  
Which combination shot the ball the furthest?

Elevator	Ball Seat	Turntable
HIGH	HIGH	HIGH
low	low	low

Which factor(s) influenced the distance the most?  
\_\_\_\_\_

## Part Two: Accuracy

### Problem #2: What are the catapult settings that will shoot the ball the closest to the target?

Using the data gathered in the Distance Challenge, choose the factor settings that you think will shoot the ball the assigned distance.

1. Write down the assigned distance
2. Write down the factor settings that you think will achieve this distance (NOTE: you may choose the Medium setting, and all the factors can be used, if desired)
3. Attempt the shot
  - If the shot is close, try again
  - If the shot is nowhere close, choose another setting
  - If you make the shot, try 2 more times with that setting

Assigned Distance	Factor Settings (L, M or H)					Success (Y or N)	Test 1	Test 2	Test 3
	Elevator	Ball Seat	Turntable	Arm Tension	Upright Tension				

# Catapult Challenge Results

	(short form)	Factor Settings (H. L)			
Group #		Elevator	Ball Seat	Turntable	Furthest Distance
1	Hypothesis				---
	Actual				
2	Hypothesis				---
	Actual				
3	Hypothesis				---
	Actual				
4	Hypothesis				---
	Actual				
5	Hypothesis				---
	Actual				
6	Hypothesis				---
	Actual				

# Catapult Challenge Results

## (Long Version)

	(long form)	Factor Settings (H, L)					
Group #		Elevator	Ball Seat	Tumtable	Arm Tension	Upright Tension	Furthest Distance
1	Hypothesis						---
	Actual						
2	Hypothesis						---
	Actual						
3	Hypothesis						---
	Actual						
4	Hypothesis						---
	Actual						
5	Hypothesis						---
	Actual						
6	Hypothesis						---
	Actual						