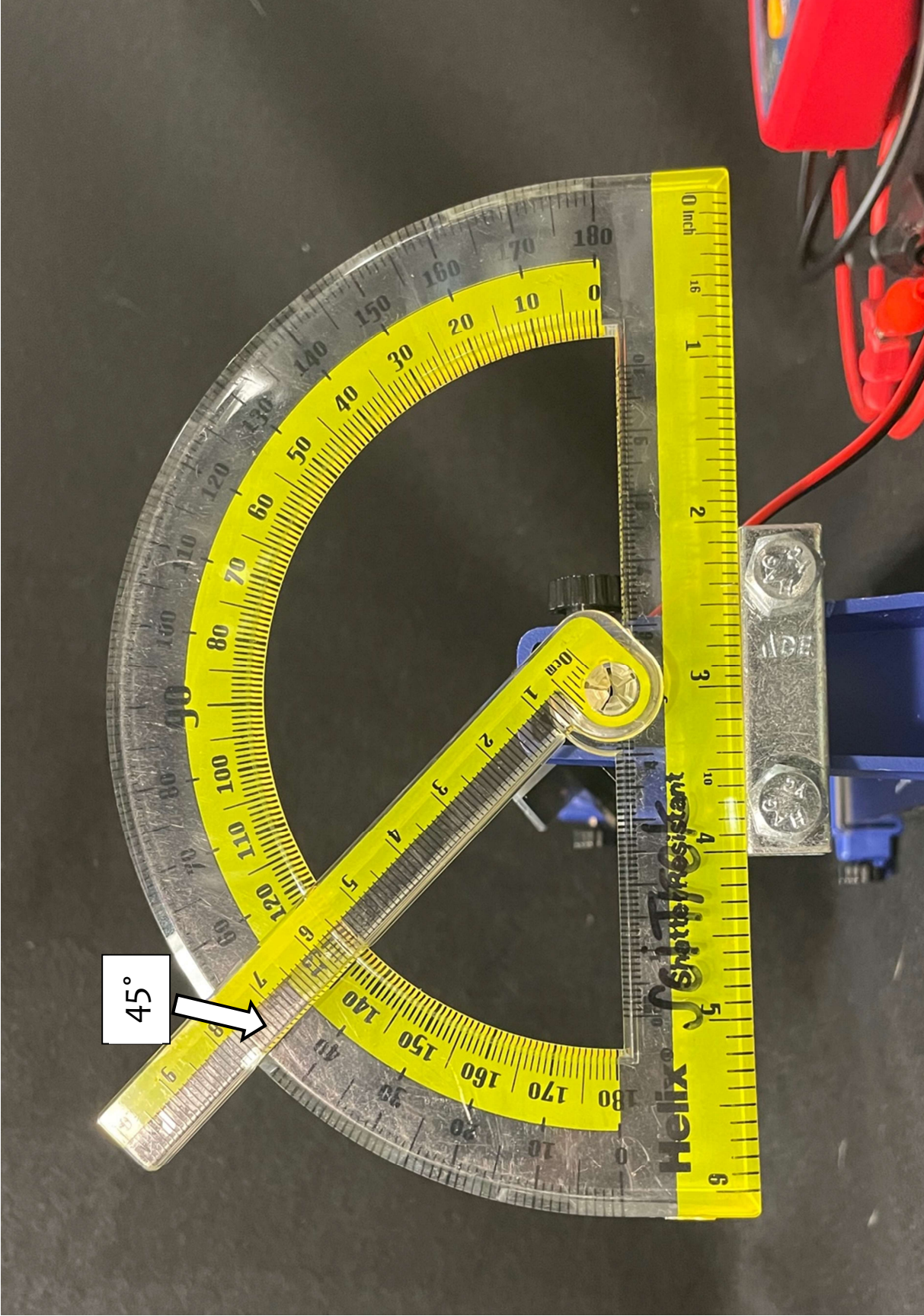# RESULTS

Table

Check the box of your subgroup control and write your subgroup symbol on the line. Then, fill out the chart for each of your trials. For the variables that remain constant, write the value in Trial D and then draw an arrow through each box indicating the variable is a control. Remember to record data measurements to the nearest tenth (Ex. 4.1 mA), calculate power to the nearest tenth (Ex. 13.2 mW), and percentages to the nearest whole number (Ex. 75%).

Subgroup Control: ☒ Panel Angle ☐ Shading Amount ☐ Temperature   **Subgroup Symbol:** __△__

Variables	Trial D	Trial E	Trial F	Trial G
(Power Source:)	1 solar panel	2 solar panel	3 solar panel	4 solar panel
<u>Panel Angle:</u>	50°	→		
<u>Shading:</u>	0/8	→		
<u>Temperature:</u> Room Temp: <u>22°C</u>	RT	→		
<u>Light Height:</u> other variable	14 cm	→		

Predictions	Trial E	Trial F	Trial G	Trial H
Put an "S" in the trial that will give the smallest power and an "L" in the trial that will give the largest power.	L			S

Data and Calculations		Trial D	Trial E	Trial F	Trial G
Measurements	Current (mA):	5.2 mA	6.0 mA	6.7 mA	7.7 mA
	Voltage (V):	1.9 V	1.9 V	2.0 V	2.0 V
Calculations	Percent CV: (get values from pg. 20)	25%	50%	75%	100%
	Power (mW): $P = I \times V$	5.2 mA x 1.9 V = 9.9 mW	6.0 mA x 1.9 V = 11.4 mW	6.7 mA x 2.0 V = 13.4 mW	7.7 mA x 2.0 V = 15.4 mW

(left margin, vertical text: Underline controls, circle changing variables, and box information about data collection.)

The independent variable is the changing variable and the dependent variables are the current and voltage.

45°

Use the clear scale to measure the angle.

FINDINGS
Experiment 1

Conclusion Summaries:

_____

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Experimental Design:

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CLASS PLAN

Subgroup: The original people you worked with.

Team: Multiple subgroups that are investigating the same changing variable.

Class Control: A control that everyone in the class has the same value for.

- The class picks this value together.

Team Control: A control that everyone in a team has the same value for, but values vary for different teams within a class.

- Teams pick this value together.

Subgroup Control: A control that everyone in a subgroup has the same value for, but values vary for different subgroups within a team.

- Subgroups pick this value on their own, with team input.

Changing Variable: The variable that is purposely changed in an experiment.

- Each subgroup picks multiple values on their own

Class Control

Team Panel Angle

☐ Orange 1   ☐ Blue 1   ☐ Green 1

☐ Orange 2   ☐ Blue 2   ☐ Green 2

Team Shading Amount

☐ Orange 1   ☐ Blue 1   ☐ Green 1

☐ Orange 2   ☐ Blue 2   ☐ Green 2

Team Temperature

☐ Orange 1   ☐ Blue 1   ☐ Green 1

☐ Orange 2   ☐ Blue 2   ☐ Green 2

Set up your graph. (Check off the steps as you complete them.)

- ☒ Write the title for your graph by filling in the blanks.
- ☒ Label the y-axis (vertical) with what you calculated, including units (Ex: Power (mW)).
- ☒ Label the x-axis (horizontal) with your modified name of changing variable, including units (Ex: Percent Angled (%)).
- ☒ Select your subgroup control in the legend by checking the appropriate box. Then, put <u>your</u> subgroup control value next to your subgroup symbol.
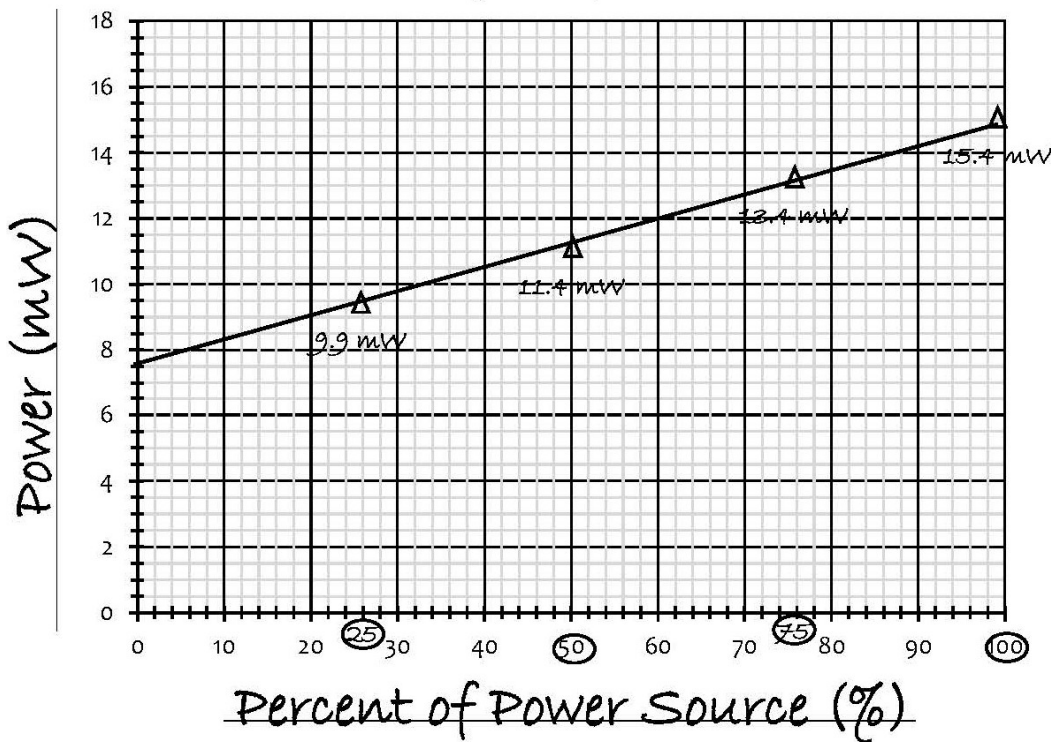
Plot your data.

- ☒ On the x-axis, circle your 4 changing variable values (as percentages). If a value is not there, write it in.
- ☒ Starting with the smallest changing variable value, determine the power, and put your subgroup symbol at the appropriate level. Write the power next to the point.
- ☒ Once you have plotted all 4 points, draw a trend line that best fits your data.

Plot the data collected by the other subgroup <u>in your team.</u>

- ☐ Complete the legend for the other subgroup in your team by writing their subgroup control value next to their subgroup symbol.
- ☐ Graph the other subgroup's 4 points using their symbol as the markers (**do not label these points**). Then, draw a trend line that best fits their data.

Effects of ___*power source*___ and ___*panel angle*___
insert changing variable   *insert subgroup control*
on the ___*power*___
insert what you calculated

Y-axis: Power (mW), 0 to 18
X-axis: Percent of Power Source (%), 0 to 100
Circled x-values: 25, 50, 75, 100
Plotted points: 9.9 mW, 11.4 mW, 13.4 mW, 15.4 mW

Legend

Subgroup Control:
- ☒ Panel Angle
- ☐ Shading Amount
- ☐ Temperature

Subgroup Symbol	Subgroup Control Value
○	
△	50°

5

Modified Name of Changing Variable:
Panel Angle: Percent Angled
Shading Amount: Percent Shaded
Temperature: Percent Heated

Set up your graph. (Check off the steps as you complete them.)

☒ Write the title for your graph by filling in the blanks.

☒ Label the y-axis (vertical) with what you calculated, including units (Ex: Power (mW)).

☒ Label the x-axis (horizontal) with your modified name of changing variable, including units (Ex: Percent Angled (%)).

☒ Select your subgroup control in the legend by checking the appropriate box. Then, put <u>your</u> subgroup control value next to your subgroup symbol.
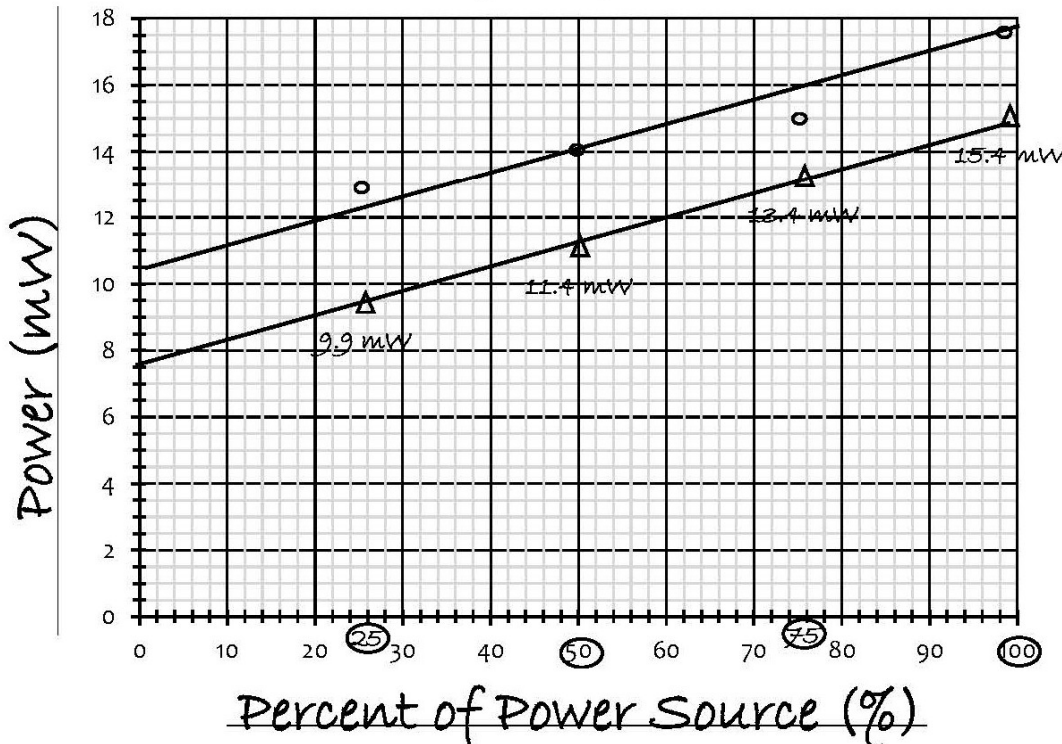
Plot your data.

☒ On the x-axis, circle your 4 changing variable values (as percentages). If a value is not there, write it in.

☒ Starting with the smallest changing variable value, determine the power, and put your subgroup symbol at the appropriate level. Write the power next to the point.

☒ Once you have plotted all 4 points, draw a trend line that best fits your data.

Plot the data collected by the other subgroup <u>in your team.</u>

☒ Complete the legend for the other subgroup in your team by writing their subgroup control value next to their subgroup symbol.

☒ Graph the other subgroup's 4 points using their symbol as the markers (**do not label these points**). Then, draw a trend line that best fits their data.

Effects of __power source__ and __panel angle__
insert changing variable   insert subgroup control

on the __power__
insert what you calculated

Legend

Subgroup Control:
☒ Panel Angle
☐ Shading Amount
☐ Temperature

Subgroup Symbol	Subgroup Control Value
O	30°
△	50°

y-axis: Power (mW)
x-axis: Percent of Power Source (%)

Plotted points: 9.9 mW, 11.4 mW, 13.4 mW, 15.4 mW

NOTES ON PRESENTATIONS

What variables affect the power produce by a solar panel?

Percent Changing Variable:	☐ Panel Angle ☐ Shading Amount ☐ Temperature				
Power (mW):					

Summary: _____

_____

_____

Percent Changing Variable:	☐ Panel Angle ☐ Shading Amount ☐ Temperature				
Power (mW):					

Summary: _____

_____

_____

Percent Changing Variable:	☐ Panel Angle ☐ Shading Amount ☐ Temperature				
Power (mW):					

Summary: _____

_____

_____