How Science Works

Grade 5

Module 1

| Class Question: |
| --- |
| |

Scientist (Your Name): _____

Teacher's Name: _____

SciTrek Volunteer's Name: _____

VOCABULARY

Science: The study of the material world using human reason. The scientific method is the way humans reason and apply logic to data to help gain knowledge of the world.

- o **Observation:** A description using your five senses. This could include contents, mass, size, color, temperature, smell, texture …

- o **Opinion:** Something you believe or feel. Not a fact or observation.

- o **Inference:** A guess based on past experiences.

- o **Testable Question:** A question for which an experiment can be designed to answer.

- o **Non-Testable Question:** A question for which an experiment cannot be designed to answer. For example, questions involving things that cannot be measured/ observed or things that are not well defined/opinions.

- o **Experimental Set-Up:** The materials, changing variable, and controls that are needed for an experiment.

- o **Experiment:** A test or trial to discover something unknown.

- o **Procedure:** A set of steps to conduct an experiment.

- o **Controls:** The variables that are not changed in an experiment.

- o **Changing Variable (Independent Variable):** The variable that is purposely changed in an experiment.

- o **Results/Data (Dependent Variable):** The measurements/observations of the experiment, which are influenced/determined by the changing variable.

- o **Prediction:** What you expect to happen based off of previous measurements/observations.

- o **Scientific Practices:** A series of activities that scientists participate in to both understand the world around them and to communicate their results with others. The specific practice worked on in this module is conclusions.

- o **Technique:** A method for a specific task.

- o **Conclusion:** A claim supported by data.

- o **Claim:** A statement that can be tested. The explanation of the data; the first part of a conclusion.

- o **Data:** Evidence collected from experiment(s) (measurements or observations); the second part of a conclusion.

- o **Shadow:** An area where direct light cannot be reached because it is blocked by an object.

- o **Light:** A form of energy that makes it possible to see things.

- o **Ring Stand:** A device made from a metal pole with a solid firm base that is used to hold scientific equipment.

Ring Stand with Clamp

- o **Clamp:** A device that can be installed on a ring stand to hold equipment such as flashlights.

- o **Angle:** A measurement telling the separation between two lines that meet at one point.

- o **Dimension:** A measurable extent of some kind, such as height, width, or length.

- o **Symmetrical:** Made up of similar parts facing each other.
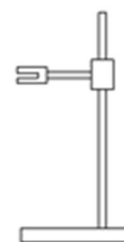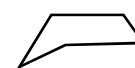
Symmetrical   Not Symmetrical

TECHNIQUE
Protractors

Protractors are used to measure and draw angles.

How to measure an angle using a protractor:

1. Line up the origin with the center point of the block and place the baseline parallel to the bottom of the block.
2. Move the swing arm to point to the center of the flashlight.
3. The angle is the value on the outer clear scale, on the clear side of the swing arm.
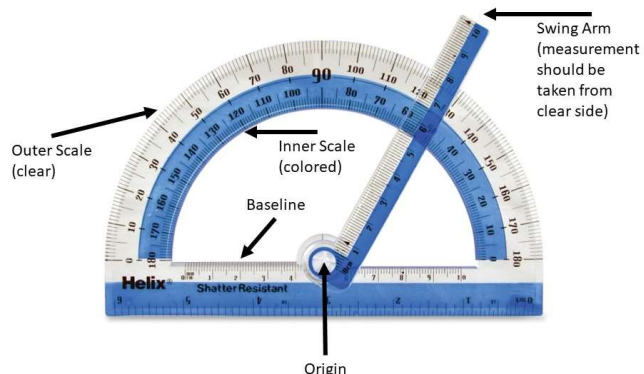
Identify the angle of the flashlight in relation to the box.

1.

2.

Angle: _____

Angle: _____

3.

4.
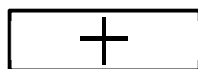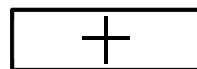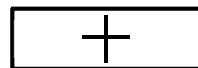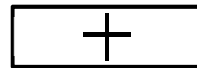
Angle: _____

Angle: _____

OBSERVATIONS

Experimental Set-Up:

_____

_____

_____

_____

_____

_____

_____

_____

On the chart below, color the box that indicates the light distance and light height.

	10	15	20	25	30	35	40	45	50	55	60
60											
55											
50											
45											
40											
35											
30											
25											
20											■

Light Height (cm) (Distance from floor to flashlight.)

Light Distance (cm)
(Distance out along floor from the block to string hanging from the flashlight.)

Light Color:	_____ Light	White Light
Shadow Color:		
Shadow Length: (Length of longest part of the shadow)		
Shadow Width: (Width of the widest part of the shadow)		

Describe what happened during the experiment:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

VARIABLES

Variable	How will changing this variable affect the shadows?
	_____ _____ _____
	_____ _____ _____
	_____ _____ _____
	_____ _____ _____
	_____ _____ _____

Experimental Considerations:

1. You will only have access to the materials on the materials page.
2. You will only have access to one flashlight with white light and the light must be focused and pointed directly at the center of the block.
3. All objects will be rectangular blocks and you will only be able to change one dimension of the block.

Changing Variable(s) (Independent Variable(s))

You will get to perform two experiments. For your first experiment, decide which variable(s) (max three) you would like to test. For each changing variable you select, discuss with your subgroup why you think that variable will affect the shadow.

Changing Variable 1: _____
Discuss with your subgroup how you think **changing variable 1** will affect the shadow.

Changing Variable 2 (optional): _____
Discuss with your subgroup how you think **changing variable 2** will affect the shadow.

Changing Variable 3 (optional): _____
Discuss with your subgroup how you think **changing variable 3** will affect the shadow.

What will you measure? (circle one)   Shadow Length   Shadow Width

QUESTION

Question our subgroup will investigate:

- If we change the _____
    insert each changing variable (independent variable)
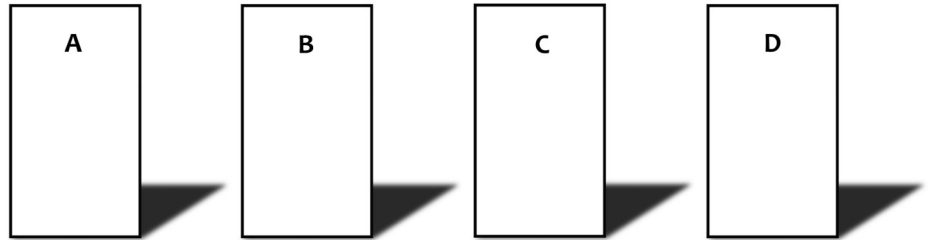
_____,

    what will happen to the_____?
        insert what you are measuring/observing (dependent variable)

SciTrek Member Approval: _____

Get a materials page from your volunteer and fill it out
before moving onto the experimental set-up.

EXPERIMENTAL SET-UP

Write your changing variable(s) (Ex: block height) and the values (Ex: 5 cm) you will use for your trials under each block.

A	B	C	D

Changing Variable(s):

1) _____ : _____ _____ _____ _____

2) _____ : _____ _____ _____ _____

3) _____ : _____ _____ _____ _____

Controls (variables you will hold constant)**:**
Write your controls and the values you will use in all your trials (control/value, Ex: light color/white).

Light Color / White   _____ / _____

_____ / _____   _____ / _____

_____ / _____   _____ / _____

SciTrek Member Approval: _____

PROCEDURE

Procedure Note:

Make sure to include all values of your changing variable(s) in the procedure. Ex: For a subgroup that decided to change block height one step would be: Place block that is 7 cm wide, 3 cm long, and A) 2 cm, B) 5 cm, C) 8 cm, and D) 10 cm high on the white plastic.
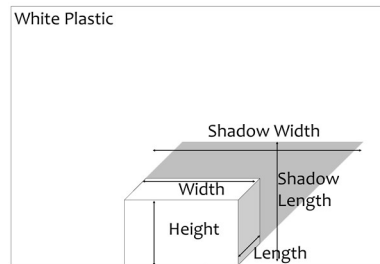
1. _____

_____

_____

2. _____

_____

_____

3. _____

_____

_____

4. _____

_____

_____

5. _____

_____

_____

6. _____

_____

_____

SciTrek Member Approval: _____

RESULTS
Table

Fill out the table for each of your trials. For the variables that remain constant, write the value in *Trial A*. Then, draw an arrow through each box indicating the variable is a control.

White Plastic
Shadow Width
Width
Shadow Length
Height
Length

Variables	Trial A	Trial B	Trial C	Trial D
Light Color:	*White*	→————————————————————→		
Block Height:				
Block Width:				
Block Length:				
Light Distance:				
Light Height:				
Light Angle:				
_____ **Other Variable**				
_____ **Other Variable**				
Predictions	Trial A	Trial B	Trial C	Trial D
Put an "S" in the trial that will give the smallest shadow length/width and a "B" in the trial that will give the biggest shadow length/width.				
Data	Trial A	Trial B	Trial C	Trial D
Measurements: Shadow Length Or Width (Circle one)				

The independent variable(s) is(are) the changing variable(s) and the dependent variable is the measurement.

Underline controls, circle changing variables, and box information about data collection.

RESULTS
Graph

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

☐ Label the y-axis (vertical) with what you measured, including units (Ex: Shadow Length (cm)).

☐ Determine an appropriate scale which will allow you to graph all of your data points and write the numbers on the given lines.

☐ Label the x-axis (horizontal) with your changing variable(s) #1, #2, and #3 (Ex: Block Height). Changing variable #2 and #3 will only be filled in if you have 2 or 3 changing variables.

☐ On your results table, label your measurements from 1 to 4, with 1 being the trial with the smallest measurement, and 4 being the trial with the largest measurement.

Plot your data in increasing order.

☐ Write the changing variable value(s) (Ex: 3 cm) for the trial that you labeled 1 under the first column.

☐ Graph your data for that trial and write the measurement above the bar.

☐ Repeat the process for the other trials.

0

_____ : _____ _____ _____ _____
Changing Variable #1

_____ : _____ _____ _____ _____
Changing Variable #2

_____ : _____ _____ _____ _____
Changing Variable #3

SCIENTIFIC PRACTICES
Conclusions

1. **Directions:** Fill in the missing definition.

    - **Conclusion**: _____

        - **Claim:** A statement that can be tested. The explanation of the data, the first part of a conclusion.

            - Ex: Donuts have more fat than toast

        - **Data**: Evidence collected from experiment(s) (measurements or observations), the second part of a conclusion.

            - Ex: 1 serving of donuts has 11 grams of fat while 1 serving of toast has 5 grams of fat.

2. **Directions:** Circle if the statement is a CLAIM, DATA, or an OPINION.

    a. out of 10 people, only 3 can ride a unicycle   *Claim*   *Data*   *Opinion*

    b. puppies are cute   *Claim*   *Data*   *Opinion*

    c. people who get 4 hours of sleep experience dizziness   *Claim*   *Data*   *Opinion*

    d. ants were observed on syrup, starbursts, and frosted flakes   *Claim*   *Data*   *Opinion*

    e. the fastest land animal in the world is the cheetah   *Claim*   *Data*   *Opinion*

    f. when 2 mL of vinegar was mixed with 2 g of baking soda, 1 L of gas was produced   *Claim*   *Data*   *Opinion*

    g. the more simple the flower, the more bees on the flower   *Claim*   *Data*   *Opinion*

SCIENTIFIC PRACTICES
Conclusions

3. **Directions:** Draw a line connecting claims with the correct data. If there is no data that supports the claim, do not draw a line.

Claim	**Because**	**Data**
1. More people go to soccer matches than basketball games		a. 1 ml of diet coke weighs 5 g and 1 ml of coke weighs 1.1 g.
2. Spicy food causes heartburn		b. 50% of people get heartburn when they use hot sauce and 10% of people get heartburn when they don't use hot sauce.
3. Cars increase air pollution		c. The air has been observed to be brown in areas with large numbers of cars.
4. Diet coke weighs less than regular coke		d. 10 people went to the movies, while 15 went shopping.

Variables	Trial A	Trial B
Light Color:	White	→
Block Height:	9 cm	→
Block Width:	7 cm	→
Light Distance:	50 cm	→
Light Height:	30 cm	→
Light Angle:	30°	60°
Data	**Trial A**	**Trial B**
Measurements: Shadow Length:	6 cm	10 cm

4. **Directions:** *Step 1:* Identify the following statements as either CLAIM or DATA and write a C or D on the line. *Step 2:* Look at the results table and circle if the statement is a correct claim, correct data, or incorrect. Statements are INCORRECT if the statement does not agree with the data table or has not been tested.

	Step 1: Statement Type: C or D	*Step 2:* Based on the table, is the statement a correct claim, correct data, or Incorrect?

a. the light height affects the length of the shadow

_____   *Correct Claim*   *Correct Data*   *Incorrect*

b. a larger light angle will result in a longer shadow

_____   *Correct Claim*   *Correct Data*   *Incorrect*

c. when a block is 9 cm tall, different light angles give different shadow lengths

_____   *Correct Claim*   *Correct Data*   *Incorrect*

d. when the light angle was 60˚, the shadow length was 6 cm

_____   *Correct Claim*   *Correct Data*   *Incorrect*

What data can be used to support claim b above? _____

_____

_____

_____

SCIENTIFIC PRACTICES
Conclusions

Variables	Trial A	Trial B
Light Color:	White	→
Block Height:	6 cm	10 cm
Block Width:	7 cm	→
Light Distance:	30 cm	50 cm
Light Height:	25 cm	→
Light Angle:	90°	→
Data	**Trial A**	**Trial B**
Measurements: Shadow Length:	5 cm	13 cm

5.

Step 1:
Statement Type: C or D

Step 2:
Based on the table, is the statement a correct claim, correct data, or Incorrect?

a. the brighter the light, the longer the shadow

———   *Correct Claim*   *Correct Data*   *Incorrect*

b. when the block height was 6 cm, the shadow length was 5 cm, and when the block height was 10 cm, the shadow length was 13 cm

———   *Correct Claim*   *Correct Data*   *Incorrect*

c. when the block height is smaller, the shadow length is longer

———   *Correct Claim*   *Correct Data*   *Incorrect*

d. the longer the light distance, the longer the shadow length

———   *Correct Claim*   *Correct Data*   *Incorrect*

If no claim can be made from the data state why not. _____

_____

_____

If no claim can be made from the results, can you make a conclusion?

☐ YES   ☐ NO

SCIENTIFIC PRACTICES
Conclusions

6. **Directions:** Decide if a claim/conclusion can be made for each of the following results tables and graph.

Table A

Variables	Trial A	Trial B
Light Color:	White	→
Block Height:	8 cm	4 cm
Block Width:	3 cm	→
Light Distance:	25 cm	30 cm
Light Height:	35 cm	→
Light Angle:	45°	60°
Data	**Trial A**	**Trial B**
Shadow Length:	8 cm	6 cm

Table B

| Variables	Trial A	Trial B
Light Color:	White	→
Block Height:	10 cm	→
Block Width:	7 cm	→
Light Distance:	40 cm	→
Light Height:	10 cm	40 cm
Light Angle:	90°	→
Data	**Trial A**	**Trial B**
Shadow Length:	8 cm	6 cm

Can this scientist make a claim/conclusion? _____

Can this scientist make a claim/conclusion? _____

Table C

Variables	Trial A	Trial B
Light Color:	White	→
Block Height:	5 cm	9 cm
Block Width:	7 cm	→
Light Distance:	45 cm	→
Light Height:	30 cm	→
Light Angle:	30°	→
Data	**Trial A**	**Trial B**
Shadow Length:	2 cm	5 cm

Graph D

Block Width:	3 cm	7 cm	5 cm	9 cm
Light Height:	25 cm	30 cm	45 cm	55 cm
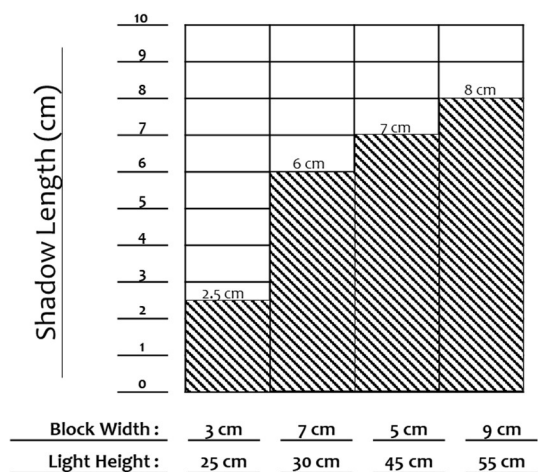
Can this scientist make a claim/conclusion? _____

Can this scientist make a claim/conclusion? _____

CONCLUSION

Making a Conclusion from Your Data

How many changing variables did you have in your experiment? _____

Can you make a conclusion from your data? ☐ **YES** ☐ **NO**
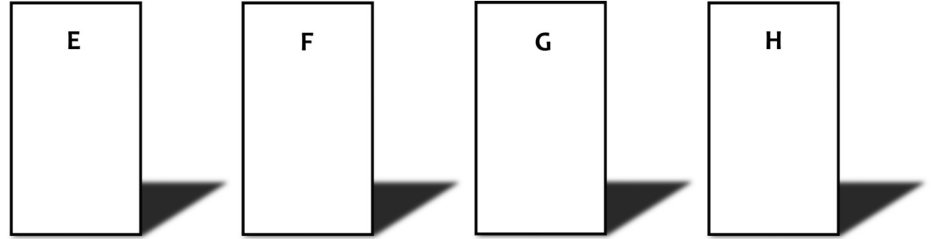

IF NO

Why?_____

_____

_____

IF YES

CONCLUSION

We can conclude _____
<div align="center">claim</div>

_____

_____

because_____
<div align="center">data (measurements/observations)</div>

_____

_____

_____

SciTrek Member Approval: _____

Changing Variable(s) (Independent Variable(s))

For your second experiment, decide which variable(s) (max three) you would like to test.

Changing Variable 1: _____

Changing Variable 2 (optional): _____

Changing Variable 3 (optional): _____

What will you measure? (circle one)   Shadow Length   Shadow Width

QUESTION

Question our subgroup will investigate:

- If we change the _____,
  insert each changing variable (independent variable)

  what will happen to the _____?
  insert what you are measuring/observing (dependent variable)

SciTrek Member Approval: _____

Get a materials page from your volunteer and fill it out
before moving onto the experimental set-up.

EXPERIMENTAL SET-UP

Write your changing variable(s) (Ex: block height) and the values (Ex: 5 cm) you will use for your trials under each block.

| E | F | G | H |

Changing Variable(s):

1) _____ : _____ _____ _____ _____

2) _____ : _____ _____ _____ _____

3) _____ : _____ _____ _____ _____

Controls (variables you will hold constant):
Write your controls and the values you will use in all your trials (control/value, Ex: light color/white).

Light Color / White _____ / _____

_____ / _____ _____ / _____

_____ / _____ _____ / _____

SciTrek Member Approval: _____

PROCEDURE

Procedure Note:

Make sure to include all values of your changing variable(s) in the procedure. Ex: For a subgroup that decided to change block height one step would be: Place block that is 7 cm wide, 3 cm long, and E) 2 cm, F) 5 cm, G) 8 cm, and H) 10 cm high on the white plastic.

1. _____

   _____

   _____

2. _____

   _____

   _____

3. _____

   _____

   _____

4. _____

   _____

   _____

5. _____

   _____

   _____

6. _____

   _____

   _____

SciTrek Member Approval: _____

SCIENTIFIC PRACTICES
Conclusions

Question: If we change the _____ *, what will*

happen to _____ *?*

Variables	Trial A	Trial B	Trail C	Trial D
Light Color:	White			⟶
Block Height:	7 cm			⟶
Block Width:	3 cm			⟶
Block Length:	5 cm			⟶
Light Distance:	20 cm			⟶
Light Height:	25 cm			⟶
Light Angle:	90°			⟶
Block Material:	Wood	Foam	Metal	Cardboard
Data	**Trial A**	**Trial B**	**Trial C**	**Trial D**
Measurements: Shadow Length:	12 cm	12 cm	12 cm	12 cm

Write a conclusion from the results above:

We can conclude _____
<center>claim</center>

_____

_____

because_____
<center>data</center>

_____

_____

_____

RESULTS
Table

Fill out the table for each of your trials. For the variables that remain constant, write the value in *Trial E.* Then, draw an arrow through each box indicating the variable is a control.

White Plastic

Shadow Width

Width

Shadow Length

Height

Length

Variables	Trial E	Trial F	Trial G	Trial H
Light Color:	*White*	→		
Block Height:				
Block Width:				
Block Length:				
Light Distance:				
Light Height:				
Light Angle:				
Other Variable				
Predictions	**Trial E**	**Trial F**	**Trial G**	**Trial H**
Put an "S" in the trial that will give the smallest shadow length/width and a "B" in the trial that will give the biggest shadow length/width.				
Data	**Trial E**	**Trial F**	**Trial G**	**Trial H**
Measurements: Shadow Length Or Width (Circle one)				

The independent variable is the changing variable and the dependent variable is the measurement.
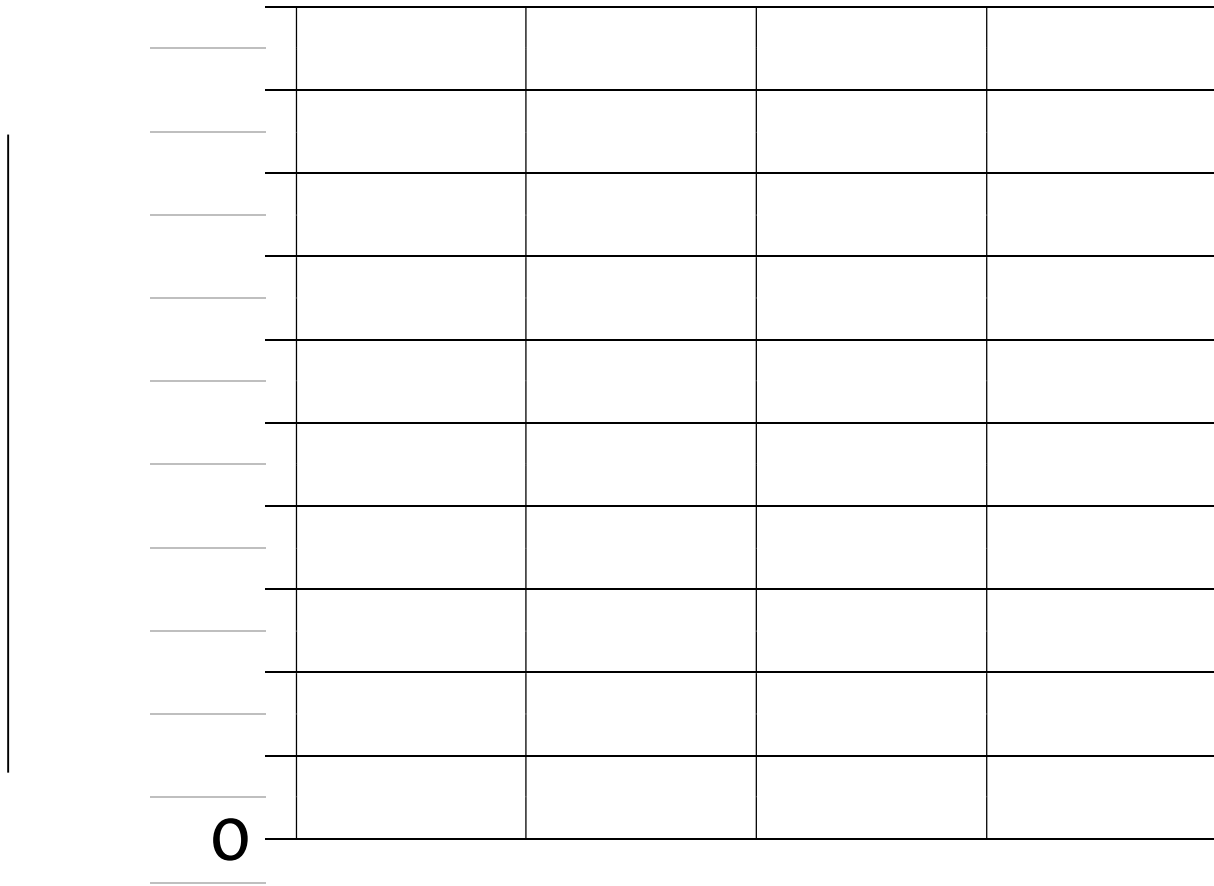
RESULTS
Graph

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

☐ Label the y-axis (vertical) with what you measured, including units (Ex: Shadow Length (cm)).

☐ Determine an appropriate scale which will allow you to graph all of your data points and write the numbers on the given lines.

☐ Label the x-axis (horizontal) with your changing variable(s) #1, #2, and #3 (Ex: Block Height). Changing variable #2 and #3 will only be filled in if you have 2 or 3 changing variables.

☐ On your results table, label your measurements from 1 to 4, with 1 being the trial with the smallest measurement, and 4 being the trial with the largest measurement.

Plot your data in increasing order.

☐ Write the changing variable value(s) (Ex: 3 cm) for the trial that you labeled 1 under the first column.

☐ Graph your data for that trial and write the measurement above the bar.

☐ Repeat the process for the other trials.

0

_____ : _____ _____ _____ _____
Changing Variable #1

_____ : _____ _____ _____ _____
Changing Variable #2

_____ : _____ _____ _____ _____
Changing Variable #3

CONCLUSION

Generate a <u>claim</u> about how your changing variable affected your results. (Ex: The block material does not affect the shadow length.)	We can conclude _____ <center>claim</center> _____ _____ _____ _____
What <u>data</u> do you have to support your claim? (Remember to include your measurements, <u>not trial letters</u>.)	because_____ <center>data</center> _____ _____ _____ _____

Can you test the first part (claim) of the conclusion?

☐ YES   ☐ NO   (If you checked this box, go back and revise your claim so that it can be tested.)

The second part of the conclusion is data because it contains a _____.

I acted like a scientist when_____

_____

_____

NOTES ON PRESENTATIONS
What variables affect shadows?

Changing Variable:				
Shadow Length Width (cm): Circle One				

Summary:_____

_____

Changing Variable:				
Shadow Length Width (cm): Circle One				

Summary:_____

_____

Changing Variable:				
Shadow Length Width (cm): Circle One				

Summary:_____

_____

Changing Variable:				
Shadow Length Width (cm): Circle One				

Summary:_____

_____

What variables affect shadows?

Changing Variable:				
Shadow Length Width (cm): Circle One				

Summary:_____

_____

Changing Variable:				
Shadow Length Width (cm): Circle One				

Summary:_____

_____

Changing Variable:				
Shadow Length Width (cm): Circle One				

Summary:_____

_____

Changing Variable:				
Shadow Length Width (cm): Circle One				

Summary:_____

_____

TIE TO STANDARDS

1. Using the given information for each experiment draw a **circle** around your **prediction** of what will happen to the shadow length and width. Once you have seen the pictures of the experiment draw a <u>box</u> around what <u>actually</u> happened to the shadow length and width. For all the experiments a 5 cm × 7 cm × 3 cm block was used.

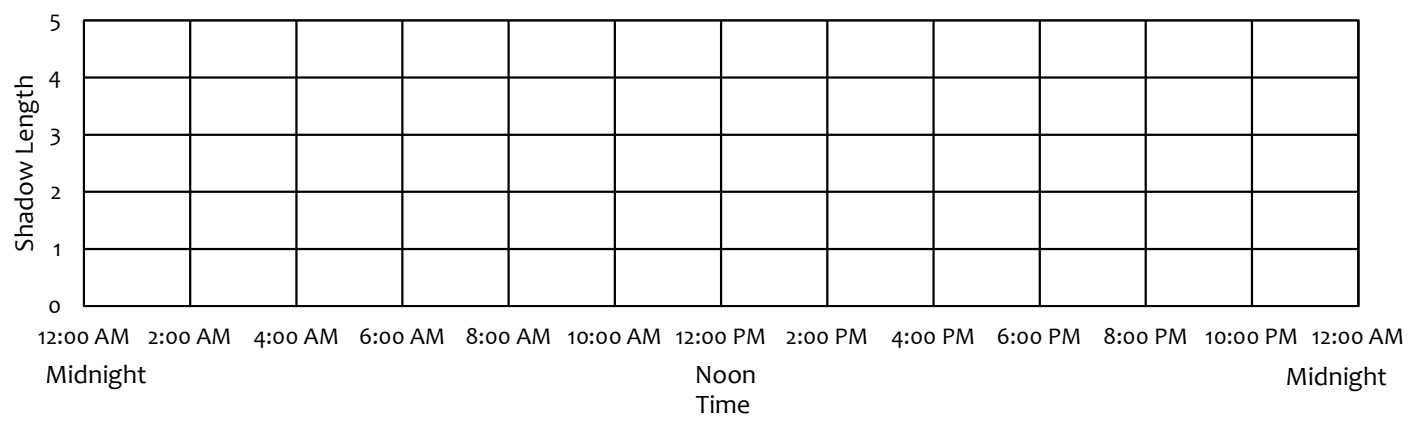| Experiment 1: Effects of Changing Light Color		

Light Color: Blue Light Height: 20 cm Light Distance: 10 cm Light Angle: 90°	**Light Color: Orange** Light Height: 20 cm Light Distance: 10 Light Angle: 90°	What will happen to:
		
		Shadow Length
		  Shorter Same Longer
		
		Shadow Width
		  Thinner Same Wider

Experiment 2: Effects of Changing Light Height		

Light Color: White **Light Height: 20 cm** Light Distance: 10 cm Light Angle: 90°	Light Color: White **Light Height: 60 cm** Light Distance: 10 cm Light Angle: 90°	What will happen to:
		
		Shadow Length
		  Shorter Same Longer
		
		Shadow Width
		  Thinner Same Wider

Experiment 3: Effects of Changing Light Distance		

Light Color: White Light Height: 20 cm **Light Distance: 10 cm** Light Angle: 90°	Light Color: White Light Height: 20 cm **Light Distance: 60 cm** Light Angle: 90°	What will happen to:
		
		Shadow Length
		  Shorter Same Longer
		
		Shadow Width
		  Thinner Same Wider

Experiment 4: Effects of Changing Light Angle		

Light Color: White Light Height: 20 cm Light Distance: 10 cm **Light Angle: 90°**	Light Color: White Light Height: 20 cm Light Distance: 10 cm **Light Angle: 150°**	What will happen to:
		
		Shadow Length
		  Shorter Same Longer
		
		Shadow Width
		  Thinner Same Wider

2. What is the most important light source in your life? _____

3. The sun rises in the _____ and sets in the _____.

4. What causes the changes in the sun's position throughout the day? _____

_____

5. Draw the sun's position and the corresponding shadow for each of the following times:

    A: Sunrise   B: Midmorning   C: Noon   D: Afternoon   E: Sunset

West   East
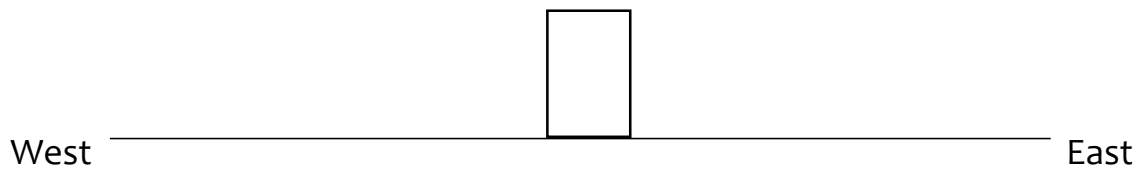
6. What time(s) of day are shadows the longest? _____

7. What time(s) of day are shadows the shortest? _____

8. Using what you have learned about shadows, make a line graph showing how shadow length changes over the course of 24 hours in the winter. Use a **red** line to show your **predicted** values and a <u>pencil</u> line to show the <u>actual</u> data.

How Shadow Length Varies in the <u>Winter</u>

Shadow Length (y-axis: 0, 1, 2, 3, 4, 5)

12:00 AM 2:00 AM 4:00 AM 6:00 AM 8:00 AM 10:00 AM 12:00 PM 2:00 PM 4:00 PM 6:00 PM 8:00 PM 10:00 PM 12:00 AM

Midnight   Noon   Midnight

Time

9. Using what you have learned about shadows, make a line graph showing how shadow length changes over the course of 24 hours in the summer. Use a **red** line to show your **predicted** values and a <u>pencil</u> line to show the <u>actual</u> data.
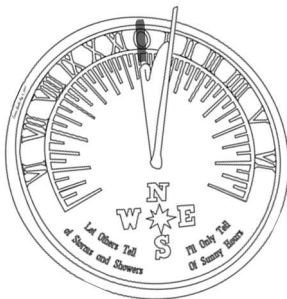
How Shadow Length Varies in the <u>Summer</u>
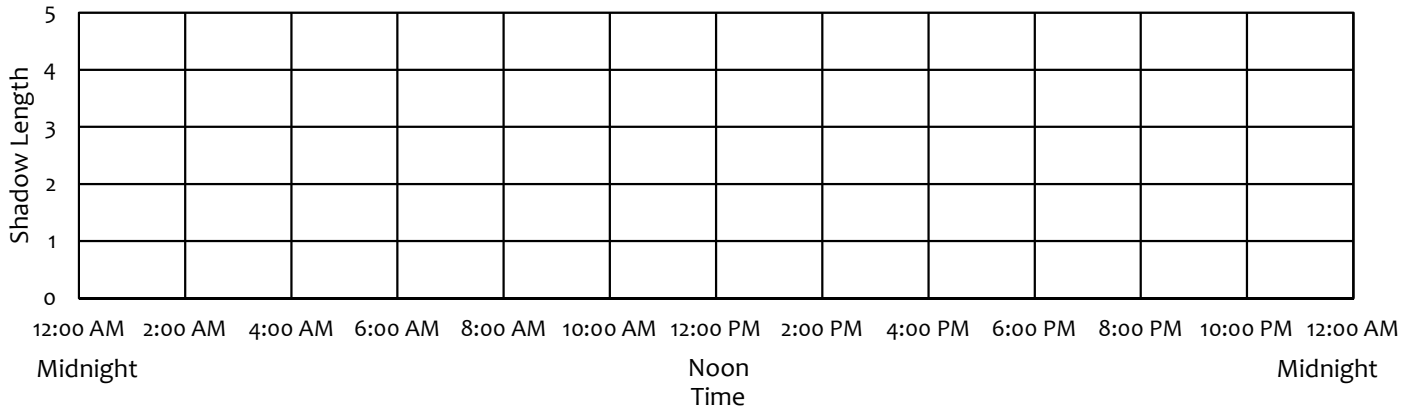
10. What conclusion can you make from the graphs about the amount of daylight throughout the year?
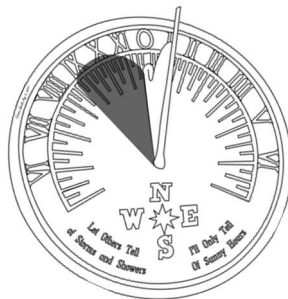
    We can conclude that the number of daylight hours in the summer is _____
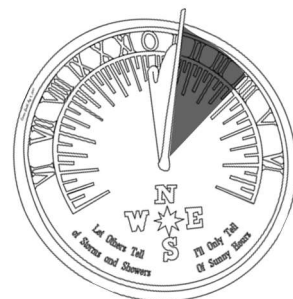
    than in the winter because _____

    _____

    _____.

11. Using the sundials below, determine what time of day it is (morning / noon / afternoon).

What time of day is it?

_____

What time of day is it?

_____

What time of day is it?

_____

EXTRA PRACTICE
Conclusions

Directions:
On the results table, underline each <u>control,</u> circle each changing variable(s), and box information about data collection.

Variables	Trial A	Trial B
Light Color:	White	⟶
Block Height:	5 cm	10 cm
Block Width:	7 cm	⟶
Light Distance:	25 cm	⟶
Light Height:	25 cm	⟶
Light Angle:	90°	⟶
Data	**Trial A**	**Trial B**
Measurements: Shadow Length:	7 cm	15 cm

Can this group make a claim/conclusion?   Yes   No   I Don't Know

|		Step 1: *Statement Type: C or D*	Step 2: *Based on the table, is the statement a correct claim, correct data, or Incorrect?*		
1.	the 5 cm block had a 7 cm shadow length and the 10 cm block had a 15 cm shadow length	_____	*Correct Claim*	*Correct Data*	*Incorrect*
2.	the block height does not affect the shadow length	_____	*Correct Claim*	*Correct Data*	*Incorrect*
3.	when the light height is 25 cm, a taller block results in a longer shadow	_____	*Correct Claim*	*Correct Data*	*Incorrect*
4.	the light distance affects the shadow length	_____	*Correct Claim*	*Correct Data*	*Incorrect*
5.	the block height affects the shadow length	_____	*Correct Claim*	*Correct Data*	*Incorrect*

What data can be used to support the correct claim(s) above? _____

_____

_____

_____

CROSSWORD PUZZLE

Directions: Fill out the following crossword puzzle using the clues below. The list of words used for the crossword can be found on the vocabulary page of your notebook (page 1).
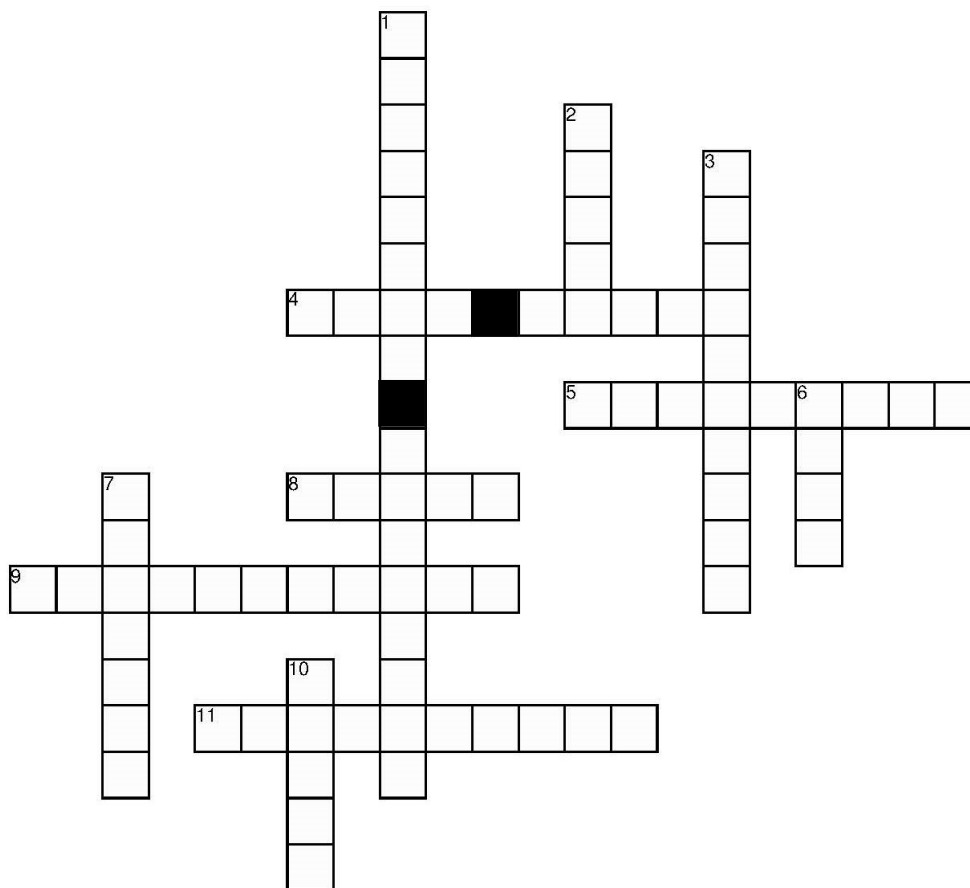
Across

4) The clamp was adjusted up and down on a _____ _____ to make the light height larger or smaller.
5) Before you carry out your experiment, you must write this to describe the steps you will take.
8) A statement explaining (what/how/why) the outcome of your results.
9) The shape and color of the shadow are examples of _____ made during this experiment.
11) An explanation of the experiment followed by observations or measurements from your results.

Down

1) In order to draw a conclusion from any experiment I run, I must have one _____ _____.
2) A form of energy that makes it possible to see things.
3) We use data from previous experiments to come up with a _____ about what will happen in future experiments.
6) This is used to support your claim.
7) We put information into a _____ table in order to easily see which variable is changing and the values of those held constant.
10) A measurement telling the separation between two lines that meet at one point.

SciTREK

SciTrek is an educational outreach program that is dedicated to allowing 2nd - 12th grade students to experience scientific practices firsthand. SciTrek partners with local teachers to present student-centered inquiry-based modules that not only emphasize the process of science but also specific grade level NGSS performance expectations. Each module allows students to design, carry out, and present their experiments and findings.

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