Inquiry 1.1: Modeling Winter and Summer Shadows

Directions: Write down the purpose then answer any questions throughout this inquiry.

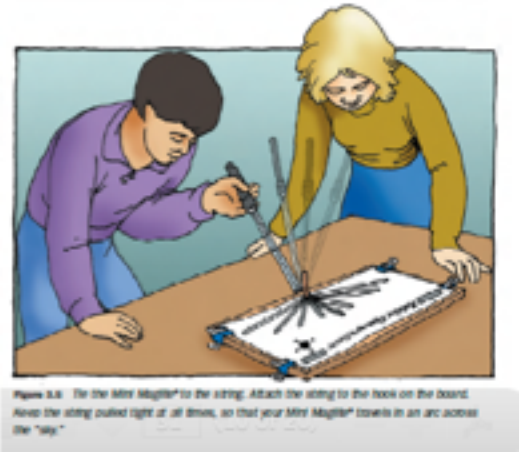
Purpose: How does the ecliptic in the winter compare to the ecliptic in the summer?

Background Information:

- What is the ecliptic?
- What "cardinal direction" does the Sun appear to move from morning to night?

Variables:

- What is the manipulated variable in this inquiry?
- What is the responding variable?



Hypothesis: (If . . . then . . .)

Procedure:

1. Put the "winter" side of the paper on the SEM board and place the blue peg in the center of where all the winter shadows meet. Place a binder clip on each side of the SEM board to hold the paper in place. The metal sides of the clip can be folded backwards so the SEM board sits more evenly on the table.
2. Hold the flashlight up behind the blue peg so the shadow formed completely fills the outline for shadow #1.
3. Continue to hold the flashlight in place while another member of your group measures the distance from the TABLE TOP to the BOTTOM of the flashlight in cm.
4. Record the height of the "Sun" (flashlight) on your data table and make sure to include the decimals if necessary.
5. Move the flashlight so the shadow made by the peg fills space #2. Repeat steps 2-4 for all the winter shadows.
6. After finding the height of the "Sun" for all the winter shadows, take out the blue peg and then flip the large white paper over to see the summer shadows.
7. Repeat steps 2 through 5 for all of the summer shadows.
8. Make a double line graph so that the winter data is a different color than the summer data.
9. Write a conclusion using the data you collected to answer the purpose question.

	Shadows									
	Time of day	1	2	3	4	5	6	7	8	9
Light Height (cm)	**Winter**									
	Summer									

Analyze the Data: Graph the height of the Sun (the light) for both winter and summer on the same graph. Answer the following questions using both the graph and the data table.

1. What is the highest point in cm of the summer's ecliptic?

   _____

2. What is the highest point in cm of the winter's ecliptic?

   _____

3. How do the highest point(s) in the summer's ecliptic compare to the highest point(s) of the winter's ecliptic? _____

   _____

   _____

   _____

Conclusion: Write a conclusion in paragraph form. Make sure to include the following questions in your conclusion.

- Restate your hypothesis.
- Explain why your hypothesis correct or incorrect.
- What was your manipulated variable?
- What was the highest point of the summer ecliptic (remember to include unit label)?
- What was the highest point of the winter ecliptic (remember to include unit label)?
- Write what you learned from this inquiry comparing the summer ecliptic to the winter ecliptic. How are they similar and/or different to each other?