

Grade: 6th Grade

Title: The Gnomon and his Shadow

Standards;

6.1.3-Recognize and explain that hypotheses are valuable, even if they turn out not to be true, if they lead to fruitful investigations.

6.2.5-Organize information in simple tables and graphs and identify relationships they reveal. Use tables and graphs as examples of evidence for explanations when writing essays or writing about lab work, fieldwork, etc.

6.2.6-Read simple tables and graphs produced by others and describe in words what they show.

Goals:

The students will hypothesize $\frac{1}{2}$ hour changes in the shadow of the gnomon throughout a school day.

The students will observe and record the change of the shadow cast by the sun.

The students will graph the results and note changes in the shadow throughout the given time.

The students will predict missing time periods i.e. during lunch, specials etc.

The students will summarize their findings.

Design or find other examples of gnomans.

Activities:

Materials are given to students to construct a gnomon.

Scientific process lab sheet completed by students

Outside experiment with gnomon

Review findings (measure shadows and construct graphs)

Summarize findings

Develop new gnomans

Read and write a synopsis about sun clocks

Procedures:

1. Students are given the materials of a rod and wheel. With overhead on, they are instructed to create a time keeping device and share their results.
2. Teacher will review each step of the scientific process for the writing of a lab report. This includes the purpose, hypothesis, materials, procedures, results, conclusion, and everyday applications.
3. Students are given gnomon paper. Discuss importance of set-up. Alignment is important!!!! Students record findings for 6 consecutive $\frac{1}{2}$ hrs. They will draw the shadow and record time.
4. Students review results by
 - A) measuring shadow length in cm
 - B) construct graph using findings

5. Students record results on worksheet and develop their conclusions for the experiment. The conclusion must include:
 - A) a statement of their findings
 - B) a statement about their hypothesis. Was it correct? Was it verified through their experimentation?
 - C) a statement about any variables found in their experiment
6. Students will summarize the selected readings for sun clocks.
7. Students will create their own individual gnomon.
8. Locate and illustrate pictures of other sun/moon clocks.

Assessments:

Written lab report (10 pts)
Purpose-1pt
Hypothesis-1pt
Materials-1pt
Procedure-2pt
Results-2pts
Conclusion-2pts
Everyday Application-1pt

Teacher observation (5 pts)
Homework (5 pts)