Investigating Light

Subject: Technology/Science/Math
Grade: 4
Time: 4 hours
Group: Whole/small group
Standards: NETS – Students 1a, 1b, 1b, 2a, 2b, 2c, 3a, 3b, 4a, 4b, 5a, 5b, 5c, 6a, 6b
Indicators: LCSD#1 Performance Indicators 3-5

Objective:

- Students will collect real data of sunrise and sunset times from site on Internet.
- Students will look for a pattern in the amount of increasing and decreasing daylight over a year
- Students will write explanations for the daylight pattern they observe
- Students will view an online demonstration to illustrate why the amount of daylight varies during the year.
- *If using different locations comparisons can be drawn about daylight hours, regions and time of year.

Resources/Materials Needed:

- Excel Software, or spreadsheet program
- Word Software, or word processing program
- Computer
- SMARTboard, projector

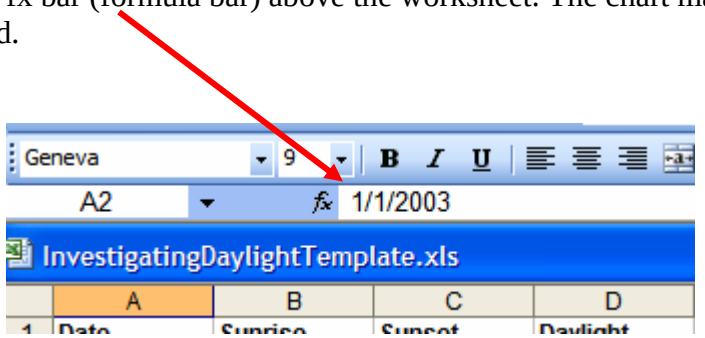
Internet sites:

- http://aa.usno.navy.mil/data/docs/RS_OneDay.html
- http://www.amnh.org/education/resources/rfl/web/antarctica/seasonal.html

Activities/Procedures:

- **Discuss/Demonstrate:**
  - Discuss/decide city locations for data purposes. (Cheyenne only, or a variety of places)
  - Open/Demonstrate the use of Excel Template file with students to familiarize them with how their worksheet may look.
  - Read through the Student Directions and visit the Astronomical Applications web site.
  - Enter practice data.
  - Clear data from template, save under student name.
  - Copy/paste info to Excel.
  - Using chart wizard. Generate chart from data.
  - Create a rubric with the class for assessment purposes.
  - Safe Internet practices and correct citations for a research project.
  - Expectations of behavior with the computers.
- **Practice:**
  - Using the ‘Save Target As’ Method add the student name to the file name and save a copy of the file to the student folder on the Z: Drive.

- Open the Excel file and change the dates in the Column A to reflect the past year. The changes will be typed in the fx bar (formula bar) above the worksheet. The chart may be deleted as a new chart will be created.



- Students will open the Astronomical Applications web site, typing the required information.
- The students will then copy/paste information from this web site into the Excel worksheet.
- Students will change times in Columns A and B. The calculation will change in column C. Using the Chart Wizard. Students will create a chart to visually represent the data.
- Students will save their work.
- Using the Student Directions document students will proceed with Part 1 #7 using word.
- Students will continue with Part 2 on the Student Directions document.
- Complete Part 2. After viewing the on-line video revise your answers in Word.

Conclusion:

- Students will print a color copy of Word document with their Excel data and chart.
- Students will analyze data together a draw conclusions.
- Teacher will assess and grade.

Closing:

- Students will display Excel information on a bulletin board in the hallway or in the classroom.