

Experiment M-12

Day and Night Sky



Objectives

- To learn about the changes that occur in the sky throughout the day and night.
- To investigate the light intensity outdoors in a 24 hour cycle.

Modules and Sensors

- PANDA-1 Panda Multi-sensor 

Materials

- USB to wall plug adaptor (used in most cellphone chargers) or alternatively, access to a computer.

Introduction

Everything in our solar system is constantly moving. The Earth, which is the third planet from the Sun, takes 24 hours to rotate. This is what causes day and night. Daylight is present when the sun is above the horizon at a particular location.

As the Earth rotates, it also revolves around the Sun. It takes the Earth one year or 365 (and a bit) days to completely orbit the sun. The Moon orbits the Earth, which takes 27 and a half days. It takes the moon two extra days to come back to the same place because the Earth keeps moving.







In this experiment you will measure the light outdoors during a cycle of 24 hours. After you get the graph you will identify the main parts of it (total dark and light time and the peak of the light intensity).

Procedure


Experiment setup


1. Make sure you have access to a window that is exposed to daylight. There should be an electrical outlet near the window or a computer.

Settings

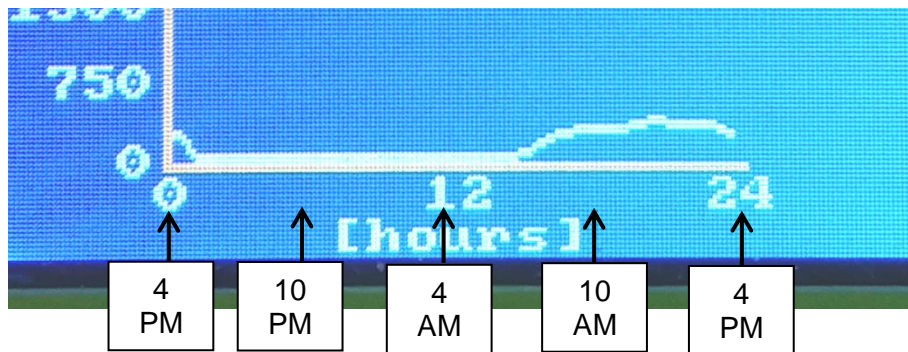
2. Connect the Panda to a voltage source. It can be plugged into the wall with the included cable and a USB to wall plug adaptor or plugged to a computer with the included cable.
3. Press on the **Sound sensor** icon  on the top left of the screen.
4. Use the arrows   to select the light sensor.
5. Press on the “lx” button on the top right of the screen.
6. Press on the **0-6000 lx** button (if it is a very bright day a higher range may be needed).
7. Click on the **Record** icon .
8. Set the duration of a day (24 hours) using the arrows  .

Testing and measurements

9. Place the sensor on the windowsill so it is facing outside.
10. Click on the **Record** icon  to start the measurement.
11. Check the Panda after one day, it might be still measuring if 24 hours are not over yet. If the experiment is finished, you might

have to open the experiment using the **Load experiment** icon . Press on this icon and choose the last experiment.

12. Your results should be similar to the following, depending on the hour of day the experiment had started.



13. We can see that in the sample experiment, after 4 pm the light intensity started to decrease, and at around 5 pm the light was gone. At around 6 am, there was an increase of light intensity that peaked at around noon. After that it started to decrease slowly until around 3 pm, when it decreased more rapidly.

Summary questions

1. Describe your results (your teacher can help you decide what the correct approximate time for every part is).
2. How long was the sky lit? How long was it dark?
3. What is the current season? Does it affect your results?