
LAB 5. SURVEYING THE SOLAR SYSTEM

Introduction

You will explore the orbital properties of small Solar System objects and assign them to categories of objects sharing specific properties. This is an online lab developed by the Vera C. Rubin Observatory, a new major astronomy research facility.

Supplies

Computers to access the Rubin Observatory website

Procedure

Getting started

Ideally, I'd like you to work in pairs for this activity. If there are an odd number of students, one group may have three people. Or, one independent student can go solo.

1. Open a web browser, and type “rubinobservatory.org/education” in the address field. This brings you to a page with several activities.
2. Click on the one titled “SURVEYING THE SOLAR SYSTEM.” This brings up a new tab.
3. Click on the “START SURVEYING THE SOLAR SYSTEM INVESTIGATION” button.

This brings up the first page of the activity. The progress bar at the top of the page shows how far you have gotten in the activity, with thumbtacks to indicate “checkpoints” along the way. This divides the activity into three parts. The arrow buttons at the bottom of the page take you forward or backward to the next or previous page.

Running the activity

First part: Understanding orbits and SSSOs

This part, introduces orbital parameters such as semi-major axis, ellipticity, inclination, and period. It also defines the major categories of Small Solar System Objects (SSSOs): NEOs, MBAs, TNOs, and comets.

4. Read the first page, then scroll ahead, doing the indicated activities and answering the questions. When you see a still of a video, click the button to run the video. When you see a button with a light bulb, click on it to display the information in a pop-up window.

The histograms displayed are interactive! Click on a bar to see the numerical data. Click on the icons to the left to display histograms of other orbital parameters.

Second part: Categorizing SSSOs

This part has lots of interactive animations. You can interact with the animations by scrolling to enlarge or reduce, or by clicking and dragging to change the viewing angle. You can also change the playback speed of some of them. Have fun learning about the families of orbits.

5. Read the text, look at the graphics, and answer the questions.

Third part: Hypothetical population

Here you decide how to describe a set of hypothetical objects whose orbits differ from the categories you have studied up to this point.

6. First, you practice classifying new objects.
7. Then, on page 42, you are introduced to a “New Class” of SSSOs. Do the activities.

Finishing Up

First: **Don’t leave without checking in with your instructor!**

8. When you get to the end, click the “REVIEW YOUR ANSWERS” button.
9. At the bottom of the window, click the “DOWNLOAD ANSWERS” button. It will create an Excel spreadsheet with your answers. Open WyoCourses and upload the spreadsheet to the lab assignment. The spreadsheet is evidence that you completed the activity, but it’s not very easy to read.
10. With the review window open, consult your instructor to **discuss your findings** and your answers.
11. Leave **after** your instructor checks you off.