

Planetary Orbits – Student Worksheet

By Louise Lopes

Introduction:

While living on the surface on the earth, it is understandable for one to think that the Earth is stationary, but in reality all the planets in our solar system are moving with tremendous force all the time. In this investigation you will use regular household items to create a model which mimics the movement of planets around the sun.

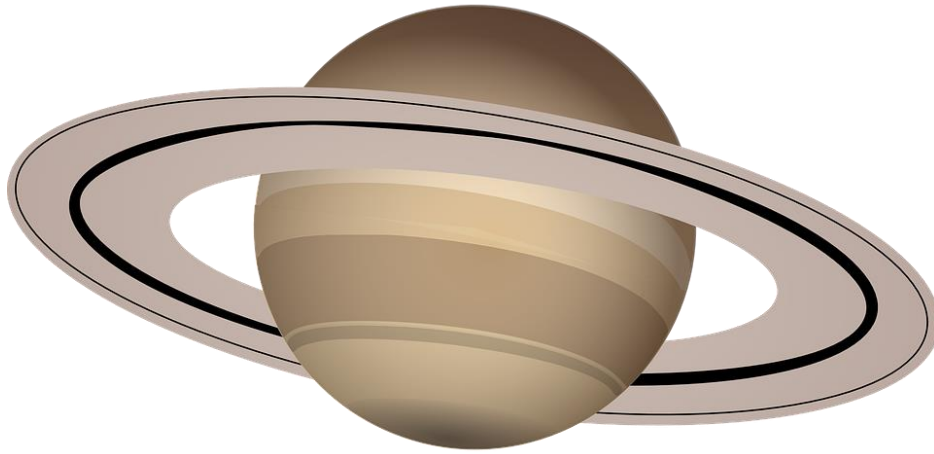


Figure 1

Questions:

The purpose of this investigation will be to explore some interesting effects of gravity. In the Plan section below there are instructions on how to set-up your equipment. Go ahead and make your model and have a play around with it first.

Once you have done this, think about what relationships between the components you can find. Pick a relationship to investigate and write a **scientific question** based on this:

Use your scientific question as a basis to write an Aim:

Make some predictions based on your scientific question and use these to form a Hypothesis:

Plan:

Materials:

- Casing of a plastic pen **OR** other small tube
- String
- Rubber bung with hole **OR** a small rubber eraser with a hole
- Washer
- Stop-watch (optional)



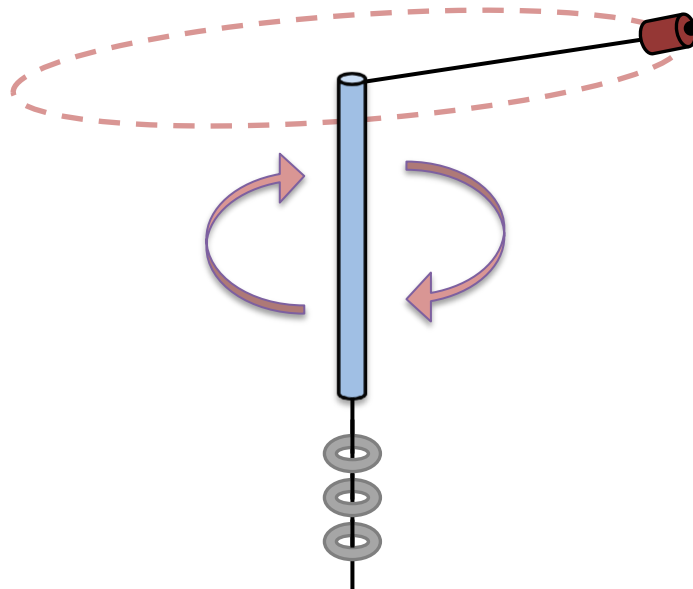
Figure 1

This experiment contains fast moving objects! Ensure the area is cleared and you have your safety goggles on at all times.

Conduct:

Instructions

1. Tie the rubber bung/eraser to the end of the string securely. You will need to pass the string through the hole in the rubber multiple times, and then double knotting it tightly
2. Place the string through the small tube
3. Tie a washer to the opposite side of the string that the rubber is on, leaving enough string for more washers to be tied on. Again be careful to tie the washer securely to the string!
4. Spin the string so that the rubber is twirling horizontally from the ground. It should look like the below diagram:



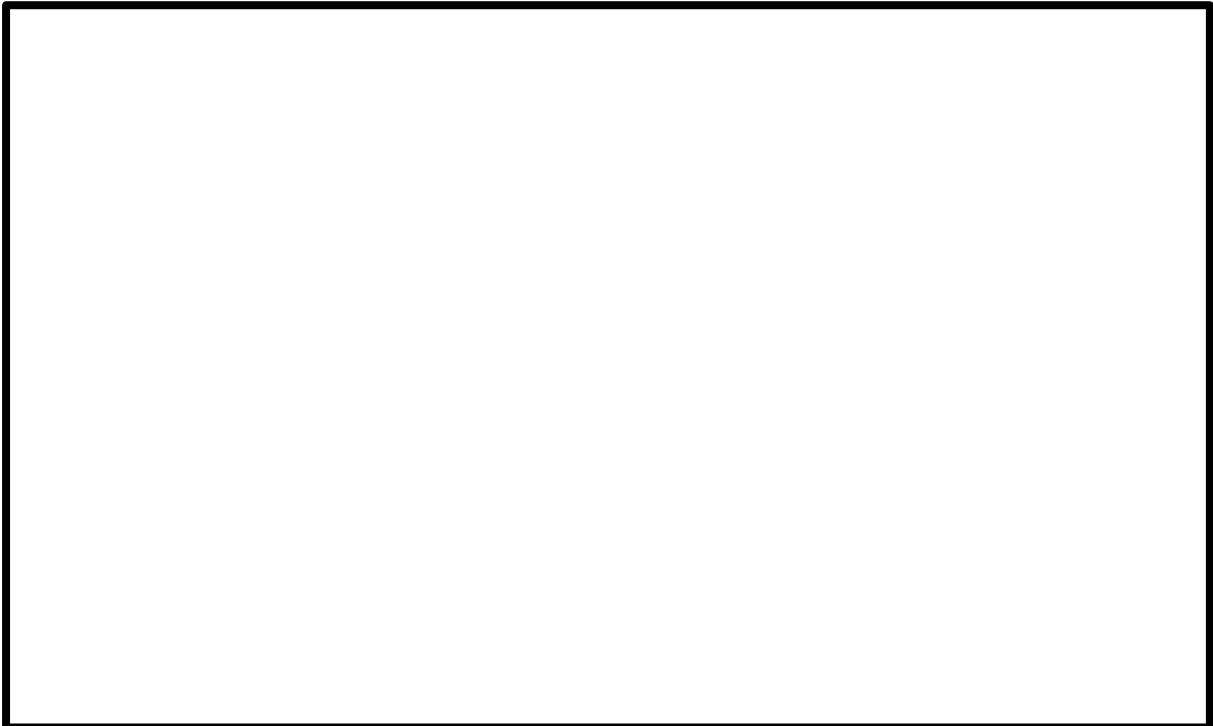
5. Spin the rubber at a speed that keeps the washer stationary. The washer cannot touch the tube.
6. Record your observations and/or results below:



7. Repeat steps 3-6 again after you have made a change to your independent variable.

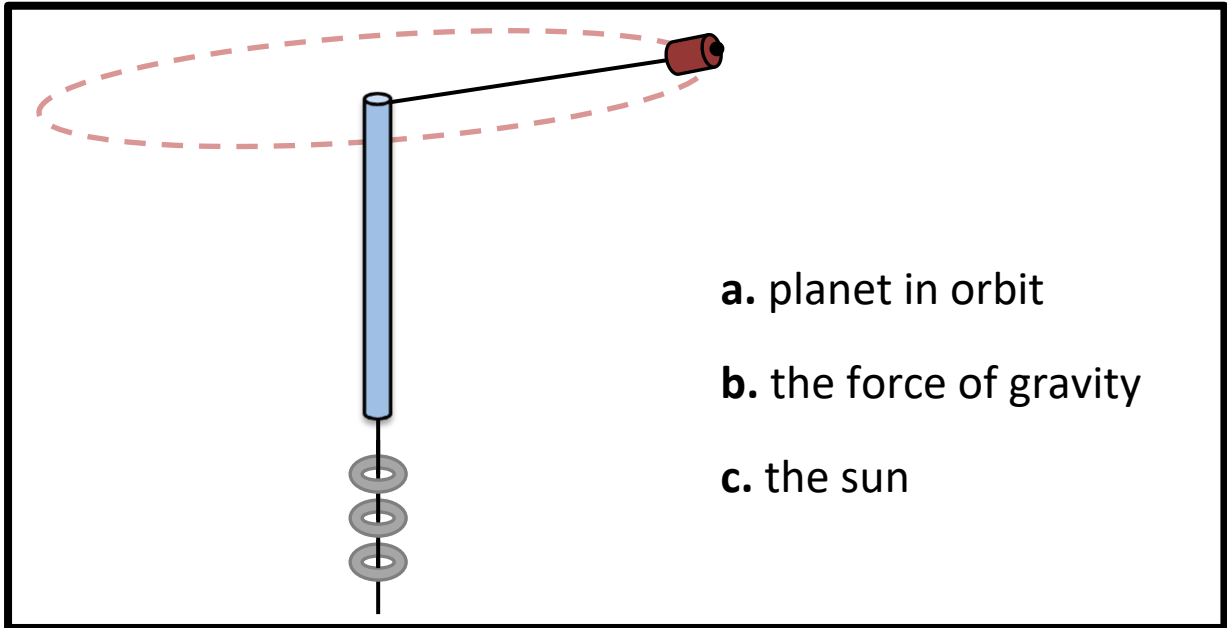
Analyse:

Think about how you can express your observations and/or results for this investigation. You can use drawings, graphs or a flowchart:



Problem-Solving:

Draw a line from **a**, **b** and **c** in order to identify which part of the model represents each concept.



Discuss your results. Do they agree with any science you know? What new things did you learn? What did you find surprising?

Assess the reliability of your experiment. Where there any sources of error? How would you improve your investigation?



Conclusion:

Conclude your investigation by writing an answer to the Question:



References:

Figure 1 – OpenClipart-Vectors, <https://pixabay.com/en/saturn-planet-saturn-rings-148300/>, CC0 Creative Commons: <https://pixabay.com/en/service/terms/#usage>

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