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## Student Research: Tools, Tips, and Tricks



# Tools, Tips, and Tricks

### Engage Your Students in Science Research Projects:

#### 1. Choose an appropriate topic:

- Encourage students to choose a project based on an area of interest them. This will make their project much more enjoyable to do.
- Provide opportunities for students to make observations in the community in which they live. This may increase their intrinsic motivation and help them to see the application of their science in their daily lives.

#### 2. Know the Scientific Practices:

- There are some key elements that characterize science. These include: reliance on observation, having a testable question, and avoiding observer bias.

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- Integrate the [Science & Engineering Practices](#) with students.
  - Engage students in Claims, Evidence, and Reasoning strategies. See this NSTA [link](#) for ideas and additional tools.

3. Seek additional resources:

- Besides the Internet, there are a number of other valuable resources that are available. Consider having students consult a subject matter expert by emailing them directly for an interview via Skype, Google Hangout, etc.
- Explore the stories and narratives of scientists and STEM professionals by reading blogs and other types of media.

4. Publish your results in a clear manner:

- Be sure to display the outcome of your research in an easy to understand way. There are a number of websites that can assist you with this, such as [International Science and Engineering Fair \(ISEF\)](#).
- Check out this GLOBE student research project poster as a great example of a way to



### Abstract

This research study is being submitted to Shumate Middle School Systems (Quinn Burgei and Brady Jaskula) from Gibraltar, Michigan. Gibraltar School District is a member of the National Middle School Science Olympiad. This program is designed to teach middle school students the scientific process and to encourage them to explore science in a variety of ways. This study was conducted during the month of September 2021 through November 2021. The purpose of this study was to determine if there was a difference in soil moisture levels between the two locations. The study was conducted using the SMAP sensor and the data was analyzed using the SMAP software. The study was conducted during the month of September 2021 through November 2021. The purpose of this study was to determine if there was a difference in soil moisture levels between the two locations. The study was conducted using the SMAP sensor and the data was analyzed using the SMAP software.

### Research Methods

We selected three soil moisture sensors for this study. The sensors were placed in the soil at three different depths: 2cm, 5cm, and 10cm. We collected data from the sensors for three weeks. The data was analyzed using the SMAP software. The sensors were placed in the soil at three different depths: 2cm, 5cm, and 10cm. We collected data from the sensors for three weeks. The data was analyzed using the SMAP software.



- #### Materials
- 1. Soil Moisture Sensor - 2cm Soil Depth
  - 2. Soil Moisture Sensor - 5cm Soil Depth
  - 3. Soil Moisture Sensor - 10cm Soil Depth
  - 4. SMAP Software
  - 5. Data Logger
  - 6. Power Supply
  - 7. Data Logger
  - 8. Power Supply
  - 9. Data Logger
  - 10. Power Supply
  - 11. Data Logger
  - 12. Power Supply
  - 13. Data Logger
  - 14. Power Supply
  - 15. Data Logger
  - 16. Power Supply
  - 17. Data Logger
  - 18. Power Supply
  - 19. Data Logger
  - 20. Power Supply



### Research Question

Will there be a difference in soil moisture levels between the two locations?

### Introduction

The purpose of this study was to determine if there was a difference in soil moisture levels between the two locations. The study was conducted using the SMAP sensor and the data was analyzed using the SMAP software.

### GLOBE BADGES

The SMAP sensor is a digital soil moisture sensor. It is designed to be used in a variety of applications. It is designed to be used in a variety of applications. It is designed to be used in a variety of applications.

### Discussion

The study found that there was a difference in soil moisture levels between the two locations. The study was conducted using the SMAP sensor and the data was analyzed using the SMAP software.

### Conclusions

The study found that there was a difference in soil moisture levels between the two locations. The study was conducted using the SMAP sensor and the data was analyzed using the SMAP software.

### Bibliography

Quinn Burgei and Brady Jaskula. (2021). SMAP Soil Moisture Study. Gibraltar, Michigan. Gibraltar School District.

communicate your findings.