Concise Title of Less Than 15 Words That Summarizes the Study Collaboration Team Names School School Name Logo

Abstract

- Concise (less than 200 words)
- Research context and objectives described
- Research question posed
- Methods communicated
- Results stated
- Conclusions drawn
- Include 3 to 5 key words to emphasize the big ideas

Research Question

Asking Questions

- Explains why this is an important question and of scientific interest
- Involves an aspect of Earth's environment about a local or global issue
- Considers ideas that previous investigations did not address
- Reflects in-depth knowledge of the content area
- Question is clearly stated
- Are answerable through scientific research appropriate to the scope of the report (i.e., scientifically testable)

Introduction

Content Knowledge

- Brief (300 to 500 words)
- Describes the environmental or societal problem the research question addresses
- States the importance or significance of the research; establishes relevance to a community
- Accurately uses science content and demonstrates understanding of basic scientific concepts and fundamental principles covered in the GLOBE protocols.
- A 1-2 paragraph research review demonstrating what you know already about this topic; includes 3 to 5 citations in text, including at least one primary source in a "peer-reviewed" journal.





Field Photos (requires release forms)

Research Methods

Planning Investigations

Describes the planning process

- Includes a map and description of the study site with mention of: (1) the area of study, (2) climatic characteristics, and (3) basic aspects of land cover
- Describes the GLOBE protocols and NASA assets to be used
- Describes organization for data collection, including instrument calibration, preparation of all materials, and tools and equipment to be used
- Data collection strategy including how the time of day of data collection would be selected, how frequently data would be collected, and the timing and location of sample collection and measurement

Carrying Out Investigations

Describes what happened

- Describe the GLOBE protocols and NASA assets actually used
- Describes data collection activities including discussions of the specific locations at a site where data sampling occurred • Describes the specifics about the data (e.g., the kinds of data,
- amounts of data)
- Describes the steps for data collection (e.g., frequency of sampling or measurement activities; the protocols used, the role of each team member in collecting data, etc.)

Map of Study Site(s)

GLOBE Badges

Be a **Collaborator**

All team members are listed including students from the same school or schools from around the world, along with clearly defined roles, how these roles support one another, and descriptions of each student's contribution. The descriptions clearly indicate the advantages of the collaboration. If the students collaborated with students from another school, describe how working with other schools improved the research.

Be a **Data Scientist**

The report includes in-depth analysis of students' own data as well as other data sources. Students discuss limitations of these data, make inferences about past, present, or future events, or use data to answer questions or solve problems in the represented system. Consider data from other schools or data available from other databases.

e an Engineer

The report uses student-generated sources of evidence to describe an engineering problem, looks at solutions through engineering, or optimizes a design to address a real-world problem, and describes the potential impact of the engineering principles on the environment.

Make an Impact

The report clearly describes how a local issue led to the research questions or makes connections between local and global impacts. The students need to clearly describe or show how the research contributed to a positive impact on their community through making recommendations or taking action based on findings.

e a STEM Professional

The report clearly describes collaboration with a STEM professional that enhanced the research methods, contributed to improved precision, and supported more sophisticated analyses and interpretations of results.

Be a STEM Storyteller

The report describes or shows how the students shared the story of their research in a creative way. This could be via a dramatic interpretation, a blog, Instagram post, artistic rendering, Or any other way to creatively share what the students learned.

Results

Analyzing Data

- Addresses the research question(s)
- Describes the procedures for data analysis including the mathematical calculations used
- Includes a detailed analysis of the data
- Tables and graphics show patterns or trends in the data
- Print screen of GLOBE visualization page



Figure #2







Global Learning and Observations to Benefit the Environment

Discussion

- **Interpreting Data**
- Discusses the meaning of the results
- Discusses how and why the results support the hypothesis or not
- Provides a description explaining the importance, relevance, and impact of the analyses, with regard to the science
- Presents a clear, complete and insightful discussion of the limitations of the methods and the data used
- Compares results with similar studies
- Suggests possible sources of error

Conclusions

Drawing Conclusions & Next Steps

- Conclusions are supported by the results
- Gives a thorough and insightful explanation as to how the conclusion was reached
- Suggests improvements in the methods
- Discusses implications for future research
- Recommends follow-up research or actions to be taken
- Discusses possible future protocols that could be used
- Describes the impact of working with a project mentor

Bibliography

References

- Cites prior literature correctly (See owl.english.purdue.edu for guidance and resources) Lists GLOBE materials and NASA assets used
- Provides sources beyond those provided by GLOBE