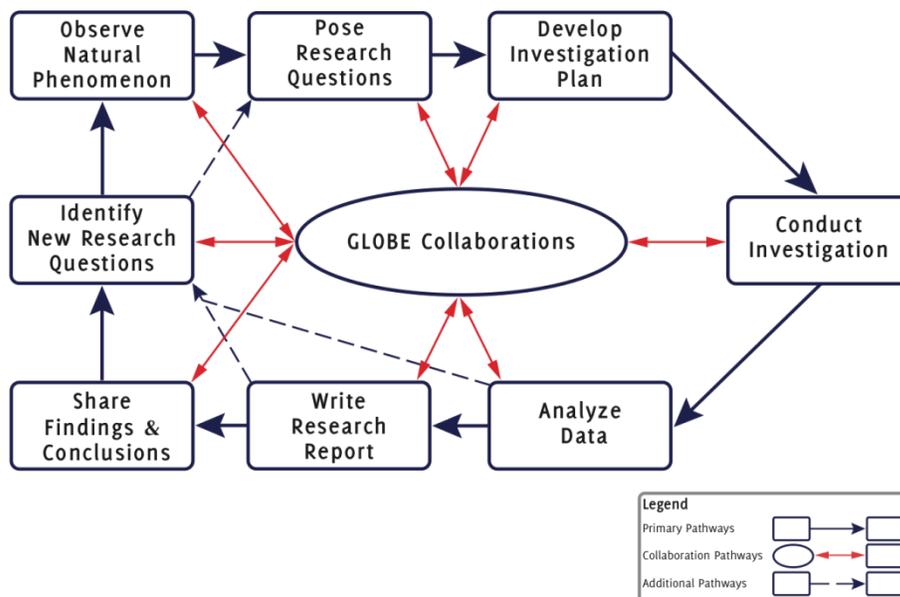


PLANNING GUIDE FOR SCIENTIFIC RESEARCH

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GLOBE Model for Student Scientific Research



The above GLOBE Model for Student Scientific Research (GMSSR) was developed by GLOBE in 2011 to illustrate the process of student scientific research. According to the GMSSR schematic diagram, the student scientist often follows a primary pathway beginning research with an initial observation of natural phenomenon and then developing a question and investigation plan. The investigation plan leads to the investigation, analysis, reporting of the conclusions, and finally to additional research questions. The steps followed may vary somewhat in each scientific study.

When designing and conducting your own science research consider the GMSSR diagram along with the following questions to guide your process. Your research process will closely follow the inquiry cycle depicted above however at all times be willing to stray from the primary pathway returning to and revising your question or investigation plan based on your initial research.

PLANNING PHASE:

1. What scientific topic will you investigate?

2. Given the topic what do you observe and wonder as scientists? What is the main question that you want to investigate?

Make preliminary observations of natural phenomenon using appropriate resources such as field or laboratory protocols, existing data sets, and scientific reports. Use these initial observations to develop a question for research. Develop a question that strongly interests you. Sometimes (but not always) the inquiry question is posed in the form of a hypothesis statement.

3. Identify the variables and develop an investigation plan.

What kind of data will address the research question? Consider the variables included in your research. What are the independent variables? What are your dependent variables? What are the controls?

Planning Matrix for Research Design

What do I need to know?	What kinds of data will I need? Independent or dependent variable?	How will I collect/obtain this data?



Consider the most effective step-by-step procedure in order to investigate your question.

1. First,
- 2.

INVESTIGATION PHASE:

1. Conduct the investigation and record data in a systematic manner.

Does the investigation plan work? Does the investigation plan require revision? Do you have the proper equipment and do you know all the safety precautions? How will you organize and display data in a systematic manner (charts, graphs, field notes)?

2. Analyze and interpret data

Consider the results and then analyze based on your scientific background, the strength of your evidence, and logic to decide what the evidence means and which model or explanation is best.

3. Share findings and conclusions

Consider a means of communicating your major findings. How will you summarize data? Will you develop additional charts, graphs, and diagrams to communicate the findings? Some options include: speaking about your study, writing a report, or creating a presentation research poster.

4. Further inquiry

Through the investigation and results analysis did any new questions develop out of the original research question? Are any of these questions substantial enough to lead to new investigations?

