

# The Science Writing Heuristic

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In this lab manual, science is performed through the lens of inquiry. To help you think through the processes of science, you'll see headings based on the Science Writing Heuristic (SWH). SWH is designed to encourage construction of conceptual knowledge. It is also based on relationships among questions, evidence, and claims. We have adapted the traditional SWH headings into:

## *Asking Questions*

Scientific investigations usually begin with a question to be answered by gathering data and experimenting. Sometimes this question will be provided, while other times you will be asked to develop the question with your laboratory partners or classmates.

## *Preparing to Investigate*

Before beginning experiments, it is important to clearly outline what data needs to be gathered. In this section, some context behind the investigation will be provided, and a brief explainer of what you'll investigate is provided. In some cases, a complete or partial procedure will be included, but many times you will devise part or all of the procedure with your laboratory partners.

## *Making Predictions*

In some investigations, you will predict what you think will happen as you gather evidence. These predictions should be based on your prior experience and will not be evaluated for correctness, but you may be asked to reflect upon them after the investigation.

## *Gathering Evidence*

The core of an investigation is gathering evidence. It contains directions, steps, or guidance for collecting data and observations. Whether the procedure is provided or devised, you will need to study it completely before beginning. You will also need to create a system—usually a data table—for recording the observations and measurements you will make during the investigation.

## *Analyzing Evidence*

The data gathered (evidence) requires further processing before the initial question can be answered. Guidance is often provided to facilitate calculations or other analysis.

## *Interpreting Evidence*

After analyzing evidence, you should ask, "What does the evidence mean?" Answering this question allows you to propose explanations for scientific phenomena. Questions within this section are designed to help you think about implications of the evidence and connect it to the purpose of the investigation.

## ***Making Claims***

Once data have been analyzed and interpreted, an answer to the initial question can be proposed. This answer often comes in the form of a scientific claim. Such claims must be supported by evidence from the investigation.

## ***Reflecting on the Investigation***

The final task in most investigations is to reflect on what was done, think about how your understanding has developed, and apply what was determined to other situations.

We hope these categories will assist you as you work through these investigations as well as help you think like a scientist.

Source: Greenbowe, T.J.; Hand, B. Introduction to the Science Writing Heuristic. *Chemists' Guide to Effective Teaching*, First edition; Pienta, N.J., Cooper, M.M., Greenbowe, T.J., eds. Prentice Hall, 2005.