

## Module 5: Minerals

### Topic 3 Application: Mineral Identification Scientific Investigation

Before you begin the scientific investigation below, make sure to download the Mineral Identification Scientific Investigation Report. As you complete this scientific investigation, fill in any needed information on the report template. If you need more information about each section of the report, visit the Developmental Module.

#### Introduction

When a mineral is found, scientists use a variety of different methods to determine what type of mineral it is. Several of these methods can be performed without the use of equipment and are based on a mineral's physical appearance. Other methods require the use of laboratory items like scratch plates.

#### Objectives

In this scientific investigation, you will:

- observe minerals' physical properties, such as hardness, color, luster, streak, and breakage;
- compare and contrast minerals; and
- examine the different methods used in mineral identification.

#### Hypothesis

Using your knowledge of mineral identification techniques, create a hypothesis or hypotheses based on the following questions: Do you expect to be able to identify all of the minerals correctly? What physical properties will make minerals easier to identify? What mineral identification technique will provide the most important data? Record these hypotheses in the Hypothesis section of your Mineral Identification Scientific Investigation Report.

#### Required Simulation

Mineral Identification Scientific Investigation – please see scientific investigation webpage

#### Procedure and Data Collection

The procedural information is provided through the simulation. Read the directions provided along with each of the ten mineral samples. As you perform the techniques on the mineral samples, make sure to complete the chart in the Data section of your Mineral Identification Scientific Investigation Report.

#### Data

An excerpt from the Data section of the Mineral Identification Scientific Investigation Report is found below. Please make sure to complete the chart on the report itself.

MINERAL NAME	COLOR	LUSTER	STREAK		HARDNESS (MOHS)						CRYSTAL STRUCTURE	CLEAVAGE/ FRACTURE	OTHER PROPERTIES	
			WHITE PLATE	BLACK PLATE	F	C	W	G	S	P				

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#### **Data Analysis**

In the Data Analysis section of your Density Scientific Investigation Report, provide responses to the following questions:

1. Please identify each of the minerals you tested, and provide that information on the chart in the Data section of your Mineral Identification Scientific Investigation Report.
2. Is color a helpful method when trying to identify minerals? Why or why not?
3. Which of the properties did you find most helpful in identifying the minerals? Make sure to explain your reasoning.

#### **Conclusion**

Using the Conclusion section of your Mineral Identification Scientific Investigation Report, compose three to four sentences describing an overall conclusion based on your data. Were your hypotheses true or false, and how do you know? Use the data and notes that you collected from your investigation to form your conclusion. Make sure that you include your information that you gained from data analysis to support your conclusion.

#### **Experimental Sources of Error Section**

On your Mineral Identification Scientific Investigation Report, provide response to the following questions: Are there any sources of error? If so, what are they, and what could be done to minimize error?



Once you have completed the Mineral Identification Scientific Investigation Report, please submit your work to the dropbox.