

Earth Sciences Short Practical Assignment #1: Minerals, Art and Architecture

As you already know from previous lectures, minerals are naturally occurring chemical compounds that make up almost all of the rocks of the Earth's crust. Physical properties vary significantly among various minerals, making them useful for different purposes. For example, whereas minerals that are both beautiful and durable are desired for use in jewellery, minerals that are less attractive but are extremely soft might be useful as ingredients for bath powder (e.g., talc) or media for drawing (e.g., graphite).

Minerals are as much building blocks of our culture as plants and animals are; we use them so often and in so many applications, we often forget about what they are, how they were formed, or why their properties are so important.

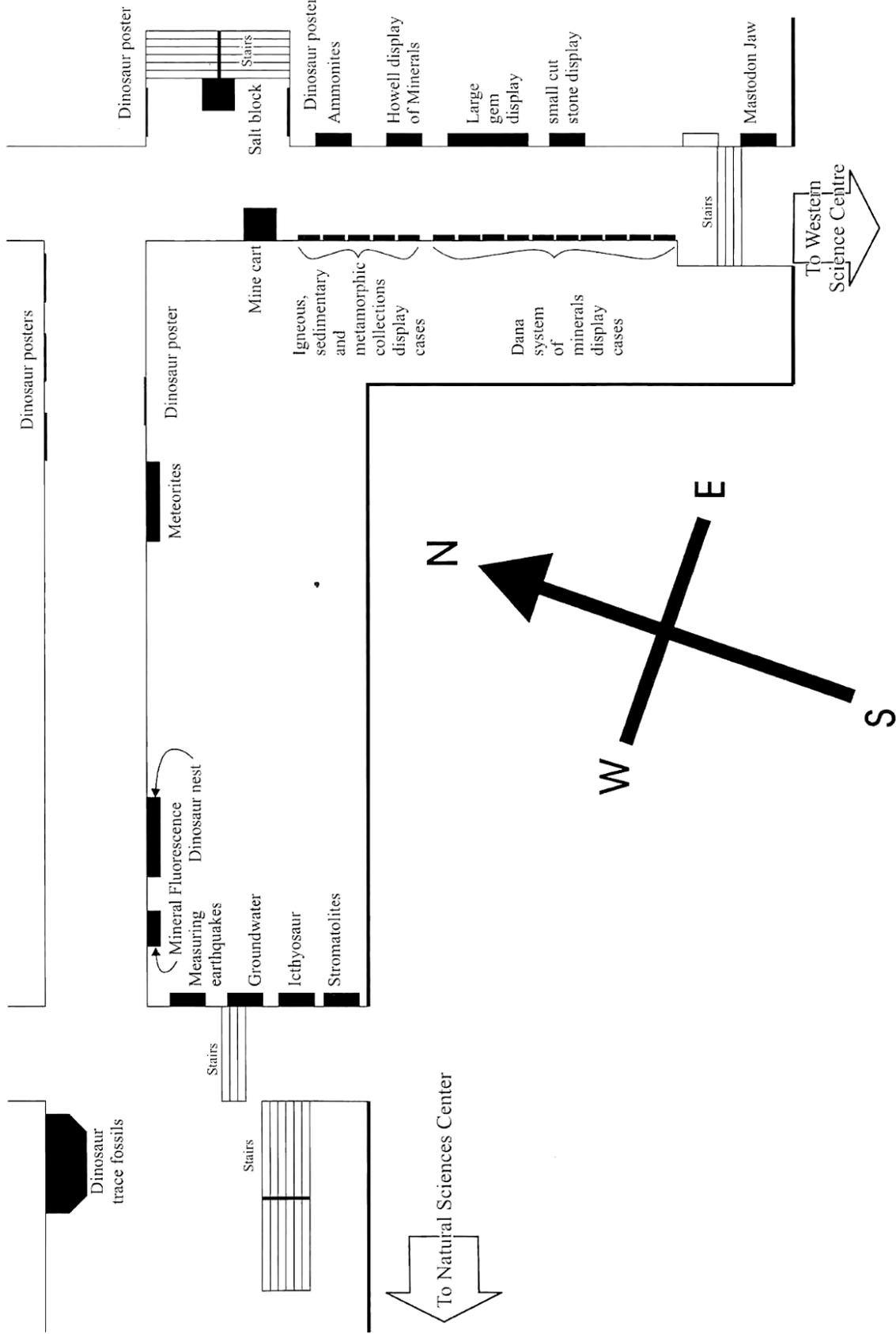
Some minerals can have a wide range of colours, while others have a very limited colour range. In some minerals, colour is a manifestation of their major chemical components, but in others, differences in the type and abundance of minor impurities can produce dramatic differences in the hue and intensity of a mineral's colour.

This first assignment requires you to observe minerals in display cabinets and record their chemical compositions. Do not let the chemical symbols intimidate you if your experience with science is limited. Think of these symbols as representing something within the mineral that contributes to its properties. While these symbols might almost appear to be written in Martian if you haven't taken any chemistry courses (or have chosen to forget about them!), it is not difficult to copy mineral compositions letter by letter.

This assignment has been purposely designed to be very easy - its main objective is simply to encourage you to look at real mineral specimens (as opposed to just looking at examples on a projector screen). We're hoping that while you are doing this assignment, you will take the time to appreciate the beauty of the many other minerals on display in our hallways and to consider how minerals are significant to aspects of culture, as ingredients of building materials and art media, and as objects of beauty in their own right.

Department (Biological and Geological Sciences Building) Tour

Schematic Map of Earth Sciences, Main Floor



Name _____

Student# _____

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Exercises

In the southeastern hallway of Biological and Geological Sciences Building you will find a number of display cases containing rock, mineral and fossil specimens. Use the accompanying map in order to locate these.

Questions:

1) In cases II, IV, V, VII and IX (on the east side of the hallway) are examples of minerals. List the chemical composition of each of the following species. (Note the bracketed Roman numerals indicate the respective cases in which you should look for each species.)

- | | | |
|--------------------|-------|-----|
| (II) Pyrite | _____ | (2) |
| (II) Hematite | _____ | (2) |
| (IV) Halite | _____ | (2) |
| (IV) Calcite | _____ | (3) |
| (IV) Rhodochrosite | _____ | (3) |
| (IV) Malachite | _____ | (5) |
| (V) Azurite | _____ | (5) |
| (V) Gypsum | _____ | (5) |
| (V) Turquoise | _____ | (8) |
| (VII) Rhodonite | _____ | (3) |
| (VIII) Talc | _____ | (4) |
| (IX) Lazurite | _____ | (5) |
| (IX) Sodalite | _____ | (5) |
| (IX) Quartz | _____ | (2) |

2) In the large gem show case on the east wall, there are a number of cut semi-precious stones and carvings.

a) One of these is a rock that consists of at least four of the above minerals. Determine the name of this rock?

_____ (5)

b) Name the pink minerals?

_____ (1) _____ (1)

c) What chemical element is found in both of the pink minerals in the large gem showcase?

_____ (2)