

THE EMAILS LAB

Introduction

This activity is designed to help you experience the true nature of science; that it is built on evidence that can be observed or deduced from the natural world. However, this evidence can sometimes be confusing, seemingly conflicting, and apparently random. Furthermore, each new bit of evidence often creates more questions than it answers. The activity illustrates that scientific explanations are only tentative explanations, because new discoveries may show that previous hypothesis were incorrect.

No scientist or scientific group works alone. This activity will demonstrate the value of collaboration within each group and with other groups in order to arrive at a reasonable explanation of the problem. There is at least one other characteristic of science which is not usually appreciated or realized by people in general. See if you can recognize it.

Directions:

1. Each group will be given an envelope containing emails written by fictional characters. Do not look at the emails until instructed to do so. When directed, and **without looking**, remove **five** of the emails from the envelope and place them on the lab table.
2. Do not allow other groups to examine your data at this time.
3. Observe the information on the emails. Try to formulate a tentative hypothesis that explains the storyline represented by them. This is your **original hypothesis**. Record this on your worksheet.
4. When directed, remove **three** more emails from the envelope. Use this new information to formulate a **second tentative hypothesis** that explains the storyline. Record this on your worksheet.
5. When directed, remove **three** more emails from the envelope. Use this new information to formulate a **third tentative hypothesis** that explains the storyline. Record this on your worksheet. Do **NOT** remove any more emails. Scientists never have all the data they might need to reach the highest level of confidence in their explanations.
6. To simulate the expanded collaborative nature of science, each group will be given a few minutes to meet with other groups to compare data. Remember, since each group drew at random, all groups may have some different data. (This simulates the sharing of data and ideas by scientists by way of personal communications, email, etc.)
7. When instructed, each group will come back together to formulate a **final hypothesis** based upon all of the available data. This hypothesis should attempt to explain the events in the life of the character(s) who wrote the emails. Record this on your worksheet.
8. Choose a spokesperson to present the group's final hypothesis to the class. This simulates the sharing process of scientists at symposia and by publishing.
9. Keep in mind that scientific explanations are tentative because we can never be absolutely sure that all of the information about a problem is known and that new information may be discovered later.
10. Answer the questions asked on your worksheet.

THE EMAILS LAB WORKSHEET

Procedure Questions: (do these with your group)

1. Original Hypothesis:

2. Tentative Hypothesis # 2: (just write the changes/additions)

3. Tentative Hypothesis # 3: (just write the changes/additions)

4. Final Hypothesis: (just write the changes/additions)

Independent Analysis Questions: (do these by yourself)

1. What bits of information on the emails were valuable to your group in formulating a hypothesis?

2. What information was not helpful and could be ignored?

3. List any misleading information that was presented.

4. Why do we say that a hypothesis in science is "tentative?"

5. How could any hypothesis in science become a theory?

6. In this activity, is your final hypothesis "correct"? Explain.