THE CHECKS LAB

Introduction

This activity is a simulation designed to help you experience how science works when figuring out past events, and that it is built on evidence that can be observed or inferred from clues in 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 Checks Lab shows how scientific explanations are only tentative explanations, because new discoveries may show that previous explanations were incorrect. It also shows that some explanations are better than others, because they more logically explain *all* the data.

No scientist 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 that is not usually appreciated or realized by most people. See if you can figure it out while doing this lesson.

Directions (Your teacher may require only one worksheet to be completed by each group).

1. Each group of students will be given an envelope that contains a total of 16-17 checks written by fictional character(s). Do not look at the checks until instructed to do so. When directed, and without looking, remove any **four** of the checks at random from the envelope and place them on the lab table. Do *not* allow other groups to examine your data at this time.

2. With your team, observe the information on the checks. Think of the checks as clues to a series of connected events. Try to figure out a possible storyline for the series of events suggested by the checks. This is your **tentative explanation #1**. Record this on your worksheet.

3. When directed, remove **four** more checks from the envelope. Use this new information to form **tentative explanation #2** that describes the possible storyline. Record this on your worksheet.

4. When directed, remove **only two** more checks from the envelope. Use this new information to create **tentative explanation #3** of what happened. Record this on your worksheet. Do **NOT** remove any more checks; scientists never have all the data they might want to reach the highest level of confidence in their explanations.

5. 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 (checks). (This simulates the informal sharing of data and ideas between scientists by way of **personal communications** e.g., e-mails, letters, phone calls, etc.)

6. When instructed, each group will get back together to formulate a **final explanation** 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 checks. Record this on your worksheet.

7. Choose a spokesperson to present the group's final explanation to the class. This simulates the sharing process of scientists at **conferences** and by **publishing**.

8. 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.

9. Try to answer the Discussion Questions asked on your worksheet. Be prepared for a **class discussion** after you answer those questions.

Name_____ Period___ Date_____

THE CHECKS LAB WORKSHEET

1. Tentative Explanation #1:

2. Tentative Explanation #2:

3. Tentative Explanation #3:

4. Final Tentative Explanation:

Questions for Discussion:

1. What bits of information on the checks were **valuable** to your group in formulating a tentative explanation?

2. What information was **useless**?

3. List any **misleading** information that was presented.

4. Why do we say that an explanation in science is "**tentative**?

5. What 's another word for a "**tentative explanation**?"

6. Could your **hypothesis** become a **theory**? If so, how?

7. What's the difference between a **hypothesis** and a **theory**?

8. Is your final hypothesis "**correct**"? Explain.

9. How could you "test" your hypothesis – i.e., what could you do to show your hypothesis is *not* correct?

10. Besides its being **tentative** and scientists **collaborating**, what other characteristic of science not often realized did you experience?