UNDERSTANDING EXPERIMENT DESIGN
A Computer-Assisted Introduction to the Scientific Method

INTRODUCTION

The Scientific Method provides a standardized method for investigation the natural world. It provides a framework for all scientists to collect and analyze data and use that data to draw conclusions about the natural world.

The Scientific Method has 5 steps:

1. OBSERVE OR IDENTIFY AN UNEXPLAINED EVENT OR PROBLEM IN THE NATURAL WORLD (usually includes literature review for any prior research on the event or problem).

2. GENERATE A HYPOTHESIS TO EXPLAIN THE EVENT OR THE SOLUTION TO THE PROBLEM. In science an educated guess is called a HYPOTHESIS.

3. DESIGN AN EXPERIMENT TO TEST YOUR HYPOTHESIS. This is perhaps the most challenging part of the process since isolating the effect of a single variable on any process can be difficult.

4. CAREFULLY AND OBJECTIVELY EXAMINE YOUR RESULTS. DO THE RESULTS OF YOUR EXPERIMENT SUPPORT YOUR HYPOTHESIS, OR DO THEY CAUSE YOU TO REJECT OR REVISE YOUR HYPOTHESIS? Your results may or may not support your hypothesis. Specifically, do your experimental observations match your experimental expectations? The results may raise more questions or require further experimentation with revisions of your hypothesis.

5. STATE A FINAL CONCLUSION BASED ON YOUR RESULTS.

Today’s exercise will focus on the Scientific Method’s biggest challenge, designing an experiment to test the hypothesis. All the steps of the Scientific Method will be covered during the exercise.

Your class is part of a special trial run to investigate use of computer-assisted instruction to teach the Scientific Method. All software costs are paid by the Grossmont College Biology Department. Your instructor may ask your assistance in evaluating this experiment.
LET'S GET STARTED!

- Find a partner. Your instructor will help dividing the class into pairs.
- Following your instructor’s directions, secure a laptop and power supply.
- Plug the power supply into the laptop and electric outlet.
- Turn on the laptop and allow it to boot up and connect to the wireless network in the lab. **STOP – DO NOT PROCEED ANY FURTHER.**
- PLEASE WAIT PATIENTLY FOR THE ENTIRE CLASS TO GET THEIR LAPTOPS POWERED UP AND CONNECTED THE NETWORK.

The program you will be using is called SIMUTEXT. It is a product of an innovative company called SIMBIO. The registration process is completed using an Internet Browser and creates a unique account for each student. The account allows each student to access, download the SimUText Software and work on today’s exercise from any computer. You will be completing the exercise outside of class. Your instructor will provide information on due dates and assessments.

Each student will complete the registration process. **WHEN BOTH STUDENTS IN EACH PAIR HAVE COMPLETED THE REGISTRATION PROCESS, THE PAIR WILL PROCEED WITH THE EXERCISE.** You may wish to share contact information with your partner so that you can collaborate on completing the exercise.

**BOTH STUDENTS ARE REQUIRED TO COMPLETE THE ENTIRE EXERCISE WITHIN THEIR ACCOUNT.** Your instructor will provide more information on what is required and how they will track student participation and completion. Remember, this is a trial run so your input on the process is encouraged.

Your instructor will provide an Access Key for you to use. Enter it in the box below. **THE ACCESS KEY IS CASE SENSITIVE.**

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When you are instructed to do so, follow the steps on the next several pages for each student in your pair.
Follow these Registration Steps for each student in your pair:

[1] START FIREFOX OR CHROME Internet Browsers AND Go to www.simutext2.com. Click on the New SimUText Subscription link at the bottom of the page.

[2] Enter the Access Key provided by your instructor into the Access Key field and click the SUBMIT button.
[3] Click on the **CREATE A SIMUTEXT ACCOUNT** button on the left.

[4] Enter your information into the data fields, and click the **CREATE ACCOUNT** button.

[4.1] YOUR USER NAME MUST BE AN EMAIL ADDRESS THAT YOU USE REGULARLY.

[4.2] YOUR PASSWORD IS YOUR DECISION

[4.3] BE SURE TO WRITE DOWN YOUR USERNAME & PASSWORD.

[5] **Account Successfully Created**: Click the **CONTINUE** button.
License Agreement: Once you have read the License Agreement, click the checkbox \textit{to the left} of "I agree to the above terms and conditions," and click Continue.

REGISTRATION INSTRUCTIONS CONTINUE ON THE NEXT PAGE
Click on the drop-down menu, and select your section. This is the Section Number you chose when you registered for classes. Check with your instructor if you are not sure which section to you are in.

Click the FINISH REGISTRATION button. An email with a link to the Student Portal has been sent to the email you used to register. It contains a link to the Student Portal so you can download the software. (See further information on the last page of these instructions.)

You are not done yet.

REGISTRATION INSTRUCTIONS CONTINUE ON THE NEXT PAGE
Research Consent: Select either Yes or No and click the SUBMIT button.

➢ THE NEXT SCREEN CONTAINS INSTRUCTIONS FOR DOWNLOADING THE SIMUTEXT SOFTWARE.

➢ DO NOT COMPLETE THESE STEPS. THE SIMUTEXT SOFTWARE IS ALREADY INSTALLED ON EACH DEPARTMENT LAPTOP.

➢ See the last page of this document for information on how you go about doing this at home.

➢ CLICK ON THE VISIT THE STUDENT PORTAL LINK and turn to the next page of these instructions.
IF YOU PARTNER HAS NOT REGISTERED, CLICK ON THE NEW SIMUTEXT SUBSCRIPTION AT THE BOTTOM OF THE PAGE. COMPLETE THE REGISTRATION PROCESS FOLLOWING THE DIRECTIONS ON THE PROCEEDING PAGES.

IF BOTH STUDENTS HAVE COMPLETED THE REGISTRATION PROCESS, CLOSE THE BROWSER WINDOW.

Find the SIMUTEXT link on the desktop. Click on the link, one student in the pair will log in. You will now begin today’s exercise.

REMEMBER, IT IS UNLIKELY THAT YOU WILL COMPLETE THE ENTIRE EXERCISE IN CLASS. Your instructor will provide information on requirements for completing the exercise outside of class and assessments.
STUDENT PORTAL INFORMATION.

To access your account and install the SimUText software at home, you will need to visit the students portal.

- https://www.simutext2.com/student

The Student Portal provides access to your account.

- In the lower right corner are tabs to alter your User Profile and change your Password.
- In the left corner are links to download the SIMUTEXT software.