It is important that you read through this summer assignment as soon as possible, and budget your work time to get it all done before school begins. The goals of this assignment are to review some biology and chemistry, to pre-assess some of your academic skills, and to get a jump-start on some AP Biology curriculum. I hope you are as excited to take this course, as I am to teach it once again. Have a wonderful summer!!!

1. **Biology by Campbell and Reese 8th edition** (9780805368444)
   Read Chapters 1-5. These cover basic introductions to science and biology, review, and continuation of your studies of biochemistry and organic chemistry. Make sure you take the time to engage with the charts, graphs, and pictures. Complete the attached reading guide for chapters 4 & 5. This will count as a 100 point homework grade.

2. **Built-in Stopwatch Lab.** This will count as a 50 point lab.

Sometimes it seems as if time flies by . . . sometimes it drags on forever. How good are you at estimating time? Do you have a built in stopwatch? Here are two ways to test the built-in stopwatch:

**Materials:** Stopwatch/phone timer/ or watch with a second hand; thermometer (oral/ear/ or infrared)

**Experiment:**
You will need to randomly choose 10 participants for your study. Fewer subjects will make it extremely difficult to analyze trends in data. The subjects are to be selected from a range of age groups. You will be testing each person once in the morning and once at night (doesn’t have to be on the same day). You will record their body temperature at the beginning of each test period. Record all your data while doing trials.

Have each test person estimate the length of one minute. Tell your subject to count to 60 by ones at a rate of one per second. When you say "Go," start your timer. When your subject gets to 60, stop the timer. How close to 60 seconds was your subject? Repeat for a total of three trials. **DO NOT** reveal the results to the subject or you may cause bias.

Next, choose a period of time, but don't tell your subject how much. Do tell the person that you will start timer and then stop it after a period of time. Say "Go" and start your timer. Your subject should begin counting at a rate of one per second. After a period of time, stop the timer and say "Stop." Ask your subject how much time has passed. Try several different time periods (5 seconds, 15 seconds, 30 seconds, 60 seconds, 90 seconds) and see if performance gets better or worse. Record how far your subject was from the actual time.

**Results:**
Create a well constructed data table including a title and all critical information. Graph age and percent error on GRAPH PAPER or on your COMPUTER. Give the graph a title, axis labels, and measured values.

* Reminder: Percent error = (Accepted – experimental/ accepted) X 100

* For instance: (60 s - 55 s/ 60s) X 100% = 0.083 X 100%= 8.3%

Thought Questions: Consider these and answer, citing data from your experiment. * Are younger people better or worse at estimating time than older people?

* Do "timing" strategies work, such as counting seconds with "1-Mississippi, 2-Mississippi, 3-Mississippi,..."? Did you have varying success with out loud versus silent counters?

* Does time estimation change with the time of day? Is morning better than night? * Does time estimation vary with body temperature?

**Read and follow directions carefully. If you have any questions, you may email me at ibink@stuartschool.org.** Realize that I may not be able to get back to you right away. All parts of this assignment will be collected on the first day of class for grading. Be prepared to share digital files via Google Classroom. Hardcopies will also be accepted.