

# Let's Study It!

**Purpose:** To learn how to do a scientific study.

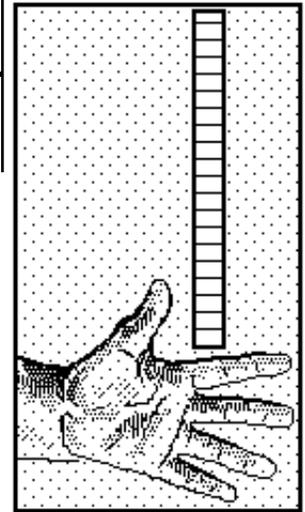
Instead of purposely changing the cause variable (as we do in experiments), we will just measure some possible cause variables and a result variable as they happen naturally. Later, we will make graphs to see if one variable does affect another variable.

**Materials:** • 1 reaction timer • 1 metric tape measure • 1 ruler (30 cm) **for each trio of students**

**Methods:**

- Each student should make a one page chart like the one below in his/her notebook.

Student Number	Your Sex (M/F)	Handedness (L/R)	Length of Forefinger (cm)	Height (cm)	Reaction Time (ms)
1					
2					
.					



- Working as a trio of students, record in the first row of your chart your own:
  - sex - Just print "M" for male or "F" for female;
  - handedness - Whether you are left or right handed - just print "L" or "R";
  - length of your forefinger - Measure it from the middle of the knuckle on the hand to the tip of your finger (do not measure the part of your fingernail which grows beyond your flesh);
  - height - Take off your shoes and have your partners measure your height - use the ruler to line up the top of the person's head with a spot on the wall which you can measure from the floor;
  - reaction time - Sit on a chair at a desk; Rest your best forearm on the table, with your hand just hanging over the edge of the desk; Hold your thumb and forefinger as if they are going to pinch something; Hold the thumb and forefinger such that they are parallel to each other; Now, have a partner hold the bottom edge of the reaction timer, just above the space between your thumb and forefinger; Without telling you (and faking it from time to time), ask him/her to drop the timer so that that you can try to catch it; Try to catch it as fast as you can! Take 5 tries and record your best time.
- In the chart which your teacher has drawn on the blackboard, record your measurements in any row number.
- Once all members of your class have recorded their measurements in the chart on the blackboard, copy all of this information into the chart in your notebook.

**These results have to be sorted before they are put on graphs. Your teacher should help you with this part, but below we will explain how to do two of the four sorting jobs.**

- To study the effect of a person's height on how fast is a person's reaction-time,
  - make two new columns in your notes; one titled "Height (cm)" and the other titled "Reaction Time (ms)";
  - find the smallest height, copy this height and that person's reaction time down in your new two-column table;
  - find the next largest height, and copy down that person's height and reaction time below the first pair of numbers;
  - keep doing this (copying the numbers down according to smallest to largest height) until all of the heights are recorded; Note: It is very important to copy the reaction time of the person who had that height beside his/her height;
  - now, you can make a labeled point-and-line graph, with "Height (cm)" as the cause variable on the x-axis.
- To study the effect of handedness on how fast is a person's reaction time,
  - make four new columns in your notes, in this order: "Left-Handed", "Reaction Time (ms)" and "Right-Handed", "Reaction Time (ms)";
  - copy down all of the reaction times according to whether the person was left or right-handed;
  - calculate the Average Reaction Time for each column; i.e. Average = total ÷ number of measurements;
  - now, you can make a labeled bar graph of "Average Reaction Time" vs. "Handedness".

**REACTION TIMERS (copy to construction paper)**

