Lab 1: The Scientific Method

Goals
1. Gain knowledge of the scientific method
2. Collect and interpret data

I. What is the scientific method?

The scientific method is a way in which one can ask a question about a given topic, guess what the answer will be, investigate the issue in detail, and conclude whether or not the guess was valid. This is the method used by scientists to investigate and gather knowledge about the natural world.

There are a series of steps that summarize this approach:
1. Make **observations** about the world around you
2. Formulate a **hypothesis** - an explanation for the observations. The hypothesis generally makes a prediction that can be tested.
3. Build an **experiment**, or series of steps, designed to solve this problem during which you will collect **data**.
4. Using a combination of text, graphs, charts, and tables, **analyze** and **interpret** your data.
5. Compare your results to your original hypothesis and draw **conclusions** as to the determined answer.

II. 'Favorite Oceanography Topic' Experiment

Look around you at all of the students taking this lab. Most of them are taking it because it's a requirement, but many likely have a particular oceanography topic they are most interested to learn about. This will be our **observation**.

QUESTION 1. What is the hypothesis? Here are five popular oceanography topics – ocean currents, climate, tsunamis, marine life, and ocean pollution. Make a prediction as to which will be the most popular topic among your classmates.

QUESTION 2. Briefly describe how you will collect the information you need from your classmates.

QUESTION 3. Collect and record your data in the table below. Let's record the data for women and men separately so we can later see whether there is a significant difference between genders. Remember, they have to pick from among the 5 topics listed in question 1.

Women	Favorite Topic		Men	Favorite Topic
1			1	
2			2	
3			3	
4			4	
5			5	
6			6	
7			7	
8			8	
9			9	
10			10	
11			11	
12			12	
13			13	
14			14	
15			15	
16			16	
17			17	
18			18	
19			19	
20			20	

QUESTION 4. The next step is to summarize the data. Use the table below.

Topic	Women	Men	TOTAL
Ocean currents			
Climate			
Tsunamis			
Marine life			
Ocean pollution			

QUESTION 5. What is the most popular topic among women in this class?

QUESTION 6. What is the most popular topic among men in this class?

QUESTION 7. Is there a difference between women and men?

QUESTION 8. What is the most popular topic among all the students (men and women) in this class?

QUESTION 9. What can you conclude from this experiment?

QUESTION 10. Did your hypothesis accurately predict the outcome of this experiment?

Sometimes, it is most useful to determine the percentage of people that chose each answer. How do you compute percentage?

$$percentage = \frac{\#\ of\ people\ that\ answered\ a\ certain\ way}{total\ \#\ of\ people\ interviewed}$$

QUESTION 11. Calculate the percentages of the class that answered each question.

Topic	Total	Percentage
Ocean currents		
Climate		
Tsunamis		
Marine life		
Ocean pollution		

QUESTION 12. Imagine that your survey results were valid for the whole state of California. Based on the most recent census data for the state (pop. = 37,253,956), how many people in the state would have given the answer you put down in question 8?