

PHYS 100 EXPERIMENT 8 (week 9)

Working with graphical representations

Name: _____ Student #: _____ Section: _____ Date: _____

Overview:

- Previous homework (10 min)
- Introduction (5 min)
- Group activity (25 min)
- Summary (10 min)
- Diagnostic (25 min)
- Final project (5 min)

Introduction (5 min, entire class)

So far in the lab you have learned how to use a variety of tools (such as histograms, scatter plots, etc). In today's lab we will learn how to *choose* which tool to use in which situation. More specifically, we will learn how to choose useful graphs to answer different questions.

This should come handy to you in a variety of situations in your studies.

Goal:

Learn how different graphical representations support reaching different conclusions.

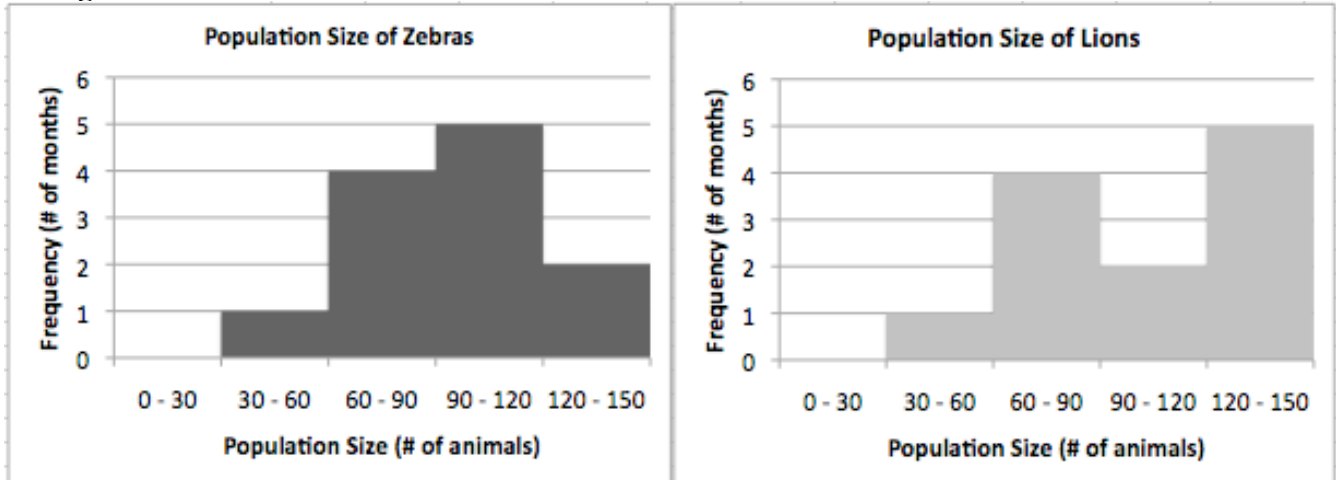
Tasks:

Task 1. Group activity (in groups of 3; 25 minutes)

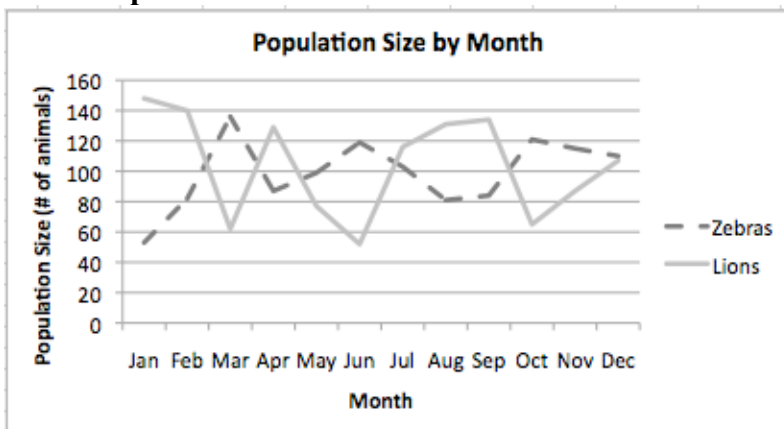
As part of studying the relationship between prey and predator in mammals, scientists have collected data about the population sizes of lions and zebras over a year in a certain reserve in western Africa.

Below you can find alternative ways to plot the data they collected:

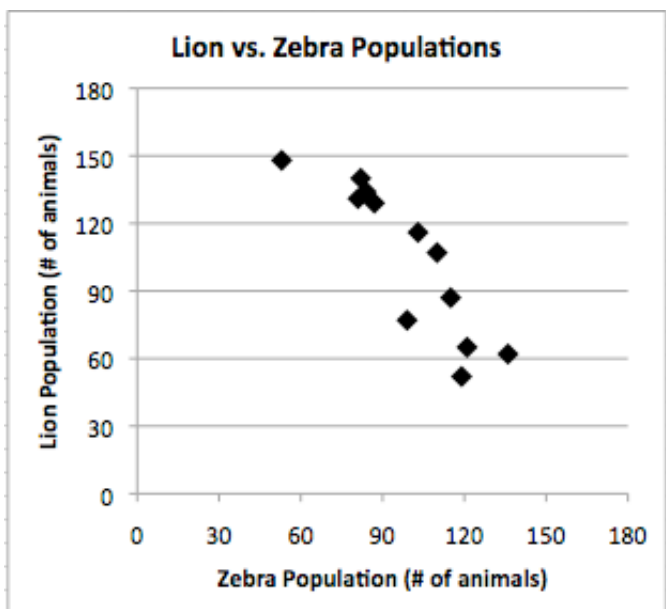
Histograms



Line Graphs



Scatter Plot



It is important to carefully consider what each kind of graph can and cannot tell you, and to choose the best graph for the job. Each group member is assigned one type of graph per question. For this graph you should do the following:

- Figure out whether your type of graph can be used to find the answer. If so, answer the question and show the other group members how it can be used to do so.
- If your graph type cannot be used to answer the question, explain why this is the case.

Then, in your group, come to an agreement about

- Which types of graphs can be used to answer each question.
- Which type of graph is the best to use for each question. Explain your choice.

To be able to assign each graph to a different person, each group member should choose one of the following “fake identities”. Please write your name below the avatar that you choose:



Gorilla

Student real name: _____






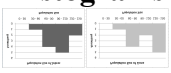
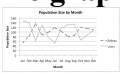


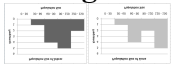
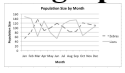
Panda




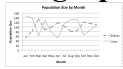

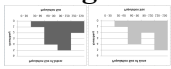
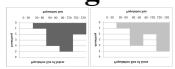
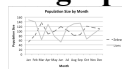
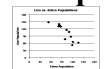
Student real name: _____




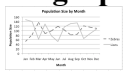

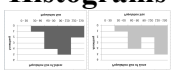

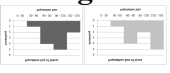
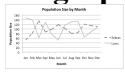


Penguin

Student real name: _____

	 Gorilla	 Panda	 Penguin
Question 1: Which animal is more common during July-September – the lion or the zebra?	Histograms 	Line graphs 	Scatter plots 
a. Individual part: - Can your graph be used to answer the question? Why or why not?			
b. Group part: - Which types of graphs could be used to answer the question? (Mark all that apply).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Which type of graph did you find most useful to answer the question? (Choose only one).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Why do you think this is the best graph to use?			
- What is your answer to Question 1?			
Question 2: The population size of which animal is more consistent?	Scatter plots 	Histograms 	Line graphs 
a. Individual part: - Can your graph be used to answer the question? Why or why not?			
b. Group part: - Which types of graphs could be used to answer the question? (Mark all that apply).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Which type of graph did you find most useful to answer the question? (Choose only one).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Why do you think this is the best graph to use?			
- What is your answer to Question 2?			

	 Gorilla	 Panda	 Penguin
Question 3: What is the predicted population size of lions during months in which the zebra population size is approximately 110 animals?	Line graphs 	Scatter plots 	Histograms 
a. Individual part: - Can your graph be used to answer the question? Why or why not?			
b. Group part: - Which types of graphs could be used to answer the question? (Mark all that apply).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Which type of graph did you find most useful to answer the question? (Choose only one).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Why do you think this is the best graph to use?			
- What is your answer to Question 3?			
Question 4: Which population is more likely to have more than 120 animals – lions or zebras?	Histograms 	Line graphs 	Scatter plots 
a. Individual part: - Can your graph be used to answer the question? Why or why not?			
b. Group part: - Which types of graphs could be used to answer the question? (Mark all that apply).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Which type of graph did you find most useful to answer the question? (Choose only one).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Why do you think this is the best graph to use?			
- What is your answer to Question 4?			

	 Gorilla	 Panda	 Penguin
Question 5: Which population has the highest number of animals in one month?	Line graphs 	Scatter plots 	Histograms 
a. Individual part: - Can your graph be used to answer the question? Why or why not?			
b. Group part: - Which types of graphs could be used to answer the question? (Mark all that apply).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Which type of graph did you find most useful to answer the question? (Choose only one).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Why do you think this is the best graph to use?			
- What is your answer to Question 5?			
Question 6: What happens to the population of the zebras when the population of the lions is large?	Scatter plots 	Histograms 	Line graphs 
a. Individual part: - Can your graph be used to answer the question? Why or why not?			
b. Group part: - Which types of graphs could be used to answer the question? (Mark all that apply).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Which type of graph did you find most useful to answer the question? (Choose only one).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Why do you think this is the best graph to use?			
- What is your answer to Question 6?			

Summary (10 min, all)

Next we will answer each of the questions together. In each case, answer the following question: **Which type of graph did you find most useful to answer the question?**

☞clicker 1: Which animal is more common during the summer – the lion or the zebra?

- A. Histograms
- B. Time-series
- C. Scatter plot
- D. Either one; doesn't matter.

☞clicker 2: The population size of which animal is more consistent?

- A. Histograms
- B. Time-series
- C. Scatter plot
- D. Either one; doesn't matter.

☞clicker 3: What is the predicted population size of lions during months in which the zebra population size is approximately 110 animals?

- A. Histograms
- B. Time-series
- C. Scatter plot
- D. Either one; doesn't matter.

☞clicker 4: Which population is more likely to have more than 120 animals – lions or zebras?

- A. Histograms
- B. Time-series
- C. Scatter plot
- D. Either one; doesn't matter.

☞clicker 5: Which population has the highest number of animals in one month?

- A. Histograms
- B. Time-series
- C. Scatter plot
- D. Either one; doesn't matter.

☞clicker 6: What happens to the population of the zebras when the population of the lions is large?

- A. Histograms
- B. Time-series
- C. Scatter plot
- D. Either one; doesn't matter.