Investigation #3: Excess for Success

Introduction: As you know, the local zoo has decided to make renovations to three exhibits in their zoo. They set aside a certain amount of money to help them complete those renovations, and luckily, they found that they still had left over funds to distribute to different departments in the zoo. Each department of the zoo wants their department to receive the extra funds.

- Money budgeted for renovations: $20,000
- Percent of budget being used: 70%
- Number of Departments: 15
- Funds awarded: $ _____?_____

Figure 1: The information you will need to know/obtain for this investigation.

Your Task: For this investigation you will need to come up with a system to help you determine how you will award the extra funds to the different departments. You will need to take into consideration the different needs and current funds of each department to develop your reward system, and you will need to apply the mathematical concepts you have learned over the past couple of weeks to help you accomplish this.

The guiding question of this investigation is: **What is the best method to use to distribute additional funds to various departments in a zoo**?

Materials: You may use any of the following materials during your investigation.

- Computer (for Internet and Excel)
- Calculator

Safety Precautions: There are no safety precautions for this investigation.

Getting Started: In order to answer this research question you will need to design and conduct an investigation. To accomplish this task, you must determine what type of data you will need to collect, how you will collect it, and how will you analyze it. To determine **what type of data you need to collect** think about the following questions:

- How will you define a method of distribution?
- What will serve as your dependent variable (e.g., Who gets funds/a stipend, the stipend received, etc.)?
- What type of measurements or observations will you need to record during your investigation?

To determine **how you will collect your data**, think about the following questions:

- What will serve as a control (or comparison) condition? *(Hint: What information do you already know and what information do you need to determine?)*
- What types of treatment conditions will you need to set up and how will you do it?
- How many different scenarios will you need to use for each condition?
- How often will you collect data and when will you do it?
- How will you make sure that your data is of high quality (i.e., how will you reduce error)?
- How will you keep track of the data you collect and how will you organize it?

In order to determine **how you will analyze your data** think about the following questions:

- How will you determine if there is a difference between the treatment conditions and the control condition? (*This is where you'll determine which system for distributing funds is best.*)
- What type of calculations will you need to make?
- What type of graph could you create to help make sense of your data?

You will need to submit an investigation proposal to your instructor for approval before you begin collecting data.

Argumentation Session: Once your group has completed your work, prepare a whiteboard that you can use to share and justify your ideas. Your whiteboard should include all the information shown Figure 2.

To share your work with others, we will be using a **Round-Robin** format. This means that one member of your group will stay at your work station to share your groups' ideas while the other group members will go to the other group one at a time in order to listen to and critique the arguments developed by your classmates.

The Research Question:	
Our Claim:	
Our Evidence:	Our Justification of the Evidence:

Figure 2. Information needed on a Whiteboard

Remember, as you critique the work of others, you have to decide if their claim is valid or acceptable based on how well they are able to support their ideas. In other words, you need to determine if their argument is *convincing and persuasive*. To do this, you might want to ask the presenter the following questions:

- How did you go about collecting your data? Why did you collect it that way?
- What did you do to make sure the data you collected is reliable? What did you do to decrease measurement error?
- How did you analyze your data? Why did you decide to do it that way?
- Why does your evidence support your claim?
- Why did you decide to use that evidence? Why is your evidence important?
- What other claims did your group discuss before you decided on that one? Why did your group abandon those alternative ideas?

Once the argumentation session is complete, you will have a chance to meet with your group and revise your original argument. Your group might need to gather more data or design a way to test one or more alternative claims as part of this process. Remember, your goal is to develop the most valid or acceptable answer to the research question at this stage of your investigation!

Report: Once you have completed your research, you will need to prepare an *investigation report* that consists of three sections. Each section should provide an answer for the following questions:

1. What were you trying to do and why?
2. What did you do during your investigation and why did you conduct your investigation in this way?
3. What is your argument?

Your report should answer these questions in 2 pages or less. This report must be typed and any diagrams, figures, or tables should be embedded into the document. Be sure to write in a persuasive style; you are trying to convince others that your claim is acceptable or valid!

	Department	Number of Employees	Current Funds Received (per month)	Visitor Rankings: 1 = Most Visited 15 = Least Visited
1	Girrafes	10	$10,000	2
2	Hippos	11	$12,000	7
3	Elephants	15	$13,000	3
4	Zebras	7	$10,000	9
5	Monkeys	8	$8,000	1
6	Lions	10	$13,500	6
7	Tigers	13	$14,000	5
8	Anteaters	8	$6,000	10
9	Antelope	6	$8,000	8
10	Kangaroos	9	$9,000	4