Name: ___________________________

There's Enough Food for All

Day 1: How Long Will You Wait?

When you go to the supermarket, how would you choose a checkout line if all you want is to get done quickly?

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If there are a few equally good food patches to feed from, how would an animal choose a patch if it is alone? How would it choose a patch when there are other animals also feeding in these patches?

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If the animal is feeding in a patch with lots of food and the patch starts getting crowded, should it move to another close-by patch which has less food but is also less crowded? Why/Why not?

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Experiment 1:

Method:
Jelly beans will be dispensed in two separate lines, at rates specific to each line. Students are to start in the middle of the room and choose whichever line they see fit. Each student is allowed to take 1 jelly bean at a time and place it in a bowl. Each student can then get back into whichever line they decide. Every 30 seconds all students would freeze and the number of students in each line will be recorded. The experiment will continue for 10 minutes.

Materials:
- Jelly beans
- Bowls
- Timer

	Number of People on Left	Number of People on Right
.5 min		
1 min		
1.5 min		
2 min		
2.5 min		
3 min		
3.5 min		
4 min		
4.5 min		
5 min		

	Number of People on Left	Number of People on Right
5.5 min		
6 min		
6.5 min		
7 min		
7.5 min		
8 min		
8.5 min		
9 min		
9.5 min		
10 min		

Title____

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What do you think was the ratio between the two rates at which jellybeans were dispensed in the two lines?

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Would you have been able to get more food if you had known the ratio before starting? Why?

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Define being:

Informed: ____

Uninformed: ____

What determined which line you chose? How would this have been different if you were by yourself?

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Experiment 2:

Method:
Jelly beans will be dispensed in two lines, at an equal rate. Students are to start in the middle of the room and choose whichever line they see fit. Students are allowed to take 1 jelly bean if they are “small” (wearing red hat) and 4 jelly beans if they are “large” (wearing blue hat) and place it in bowl. Students can then get back into whichever line they choose. Every 30 seconds all students would freeze and the number of students in each line will be recorded. The experiment will continue for 10 minutes.

Materials:
- Jelly Beans
- Bowls
- Timer
- Party hats

Compared to the previous experiment, what do you think will happen when different animals can eat different amounts?

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	Number of People on Left	Number of People on Right
.5 min		
1 min		
1.5 min		
2 min		
2.5 min		
3 min		
3.5 min		
4 min		
4.5 min		
5 min		

	Number of People on Left	Number of People on Right
5.5 min		
6 min		
6.5 min		
7 min		
7.5 min		
8 min		
8.5 min		
9 min		
9.5 min		
10 min		

Title____

What determined which line you got food from?

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How could this be seen in the wild?

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Question for next time:
What issues you think you would have to account for if you were doing this experiment with real animals, say fish?

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Day 2: Something's Fishy Part I

Method:
Students will be divided into groups of ~5. Each group will receive 2 tanks of zebrafish; with the Left and Right halves marked. Every 30 seconds students will feed a given amount of brine shrimp to each side of the tank and after 5 seconds of feeding, record how many zebrafish are on each side of the tank. Each trial will last 5 minutes and would be repeated twice with two different ratios of food input.

Materials

- Zebrafish
- Live brine shrimp (any type of food will work), measured in small vials
- Tanks
- Timer
- Tape to divide the tank in half

Tank 1:

Food Input Ratio L_______:R_______

How do you think the ratio will affect how the zebrafish spread themselves out?

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Tasks:

_______________: Timer

_________________: Recorder

_______________ : Feeder R

_________________: Observer

________________: Feeder L

Observer should look at the number of fish on ONLY one side and then after the experiment is done calculate how many should be on the other

	Number of Fish on Left	Number of Fish on Right
.5 min		
1 min		
1.5 min		
2 min		
2.5 min		

	Number of Fish on Left	Number of Fish on Right
3 min		
3.5 min		
4 min		
4.5 min		
5 min		

Title ____

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Is the observed data similar to what is expected (given by the bold line in the graph)? If it is not, what do you think is going on?

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	# of Fish on Left	#of Fish on Right
.5 min		
1 min		
1.5 min		
2 min		
2.5 min		

	# of Fish on Left	# of Fish on Right
3 min		
3.5 min		
4 min		
4.5 min		
5 min		

Title:____

Are your results closer to the expected ratio than others? If so why do you think it is?

Tank 2:

Ratio L_____________:_R_____________

Tasks:

_______________: Timer

_______________ : Feeder R

________________: Feeder L

________________: Recorder

________________: Observer

Observer should look at the number of fish on ONLY one side and then after the experiment is done calculate how many should be on the other

	Number of Fish on Left	Number of Fish on Right
.5 min		
1 min		
1.5 min		
2 min		
2.5 min		

	Number of Fish on Left	Number of Fish on Right
3 min		
3.5 min		
4 min		
4.5 min		
5 min		

Title ____

Based on the number of fish on each side, what do you think the ratio was?

What are the advantages of the fish spreading themselves out in this fashion?

Question for next time: What will happen when the food input into either side is switched with each other?

Day 3: Something's Fishy Part II

Method:

Students will be divided into groups of either 4-5 students per group. Each group will receive a tank of zebrafish; with the Left and Right halves marked. Every 30 seconds students will feed a given amount of brine shrimp to each side of the tank and record how many zebrafish are on each side of the tank. After 5 minutes the amount being fed in each side will be switched. Each trial will last 10 minutes.

Materials

- Zebrafish (any small fish should work)
- Live brine shrimp (any type of food should work)
- Tanks
- Small containers containing the given amount of food
- Timer
- Tape to divide the tank in half

Tasks:

________________: Timer

_________________: Recorder

________________ : Feeder R

_________________: Observer

_________________: Feeder L

	Number of Fish on Left	Number of Fish on Right
.5 min		
1 min		
1.5 min		
2 min		
2.5 min		
3 min		
3.5 min		
4 min		
4.5 min		
5 min		

	Number of Fish on Left	Number of Fish on Right
5.5 min		
6 min		
6.5 min		
7 min		
7.5 min		
8 min		
8.5 min		
9 min		
9.5 min		
10 min		

Title ____

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What happened when the amount fed on each side is switched?

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Name:___________________________

All New Explorers Must Answer a Science Question

1. When at the checkout of a grocery store, what is the most important thing(s) that should determine which line you get in if you want to get out of there fast?
    A. Length of the line
    B. How many groceries people have
    C. How friendly the cashier is
    D. All the above
    E. A and B

2. What is the most important thing (s) that animals need to know when it comes to a specific food source?
    A. How many animals are already at that food source
    B. How much food there is at the source
    C. If the animal knows the other animals there
    D. All the above
    E. A and B

3. Why do older animals know where to find the best food?
    A. They just know
    B. They are stronger
    C. They have experience
    D. Chance
    E. They really do not know

4. Why is the size of other animals around you important when it comes to eating?
    A. You are smaller so you eat more to grow bigger
    B. Bigger animals eat more causing less food being left for others
    C. It does not matter because everyone shares
    D. All the above
    E. A and B

What did you take away from these three days of experiments?

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