

## Aquarium Count

### Purpose:

This lesson allows students to practice estimation strategies, as well as practice in creating graphs to accurately represent data, while gaining an appreciation for the scientific importance of wild animal counting.

### Curriculum Match:

For Curriculum Match visit:

<http://www.vanaqua.org/education/LearningOutcomesandIRPCConnections.pdf>

- Direct experience is the basis of human learning
- Students should be provided opportunities to develop an aesthetic appreciation of the environment

(Taken from Appendix C: Cross – Curricular Outcomes)

\*\* Adapt to best suit your grade level.

### Materials:

- paper
- pencil
- graph paper
- clipboard or binder (hard surface to write on)

### Background Preparation:

The students should have a basic understanding of estimating and graphing prior to attempting this activity.

Discuss beforehand:

What size is the population of humans in Canada?

What size is the population of salmon in the Pacific Ocean?

Is one of these questions easier to answer than the other?

Why or why not?

Counting animals is a very important skill for scientists. Why?

Counting animals can be very difficult. Why?

What is an estimate?

What are the different strategies you can use to estimate? (Try to count each animal, make a wild guess, count the number in a fraction of the space and multiply, have two people make a guess and average the two guesses...)

What are the criteria for a clear, informative graph?

### Procedure at the Aquarium:

Working in small groups or partners:

1. Explore the Aquarium and choose 3 exhibits (the exhibits you choose should have *at least* 20 individuals).

2. Prepare to estimate the number of animals in the following groups in each of your three chosen exhibits: invertebrates, reptiles, birds, amphibians, mammals and fish.
3. Decide how you are going to estimate each group before you start (you may want to use different strategies for different groups).
4. Use graphs to show your results.
5. Write a paragraph explaining how you made your estimates and if you think your strategies worked well. If you had more time or more equipment, how would you get a better estimate?
6. Make up three questions about your graph.

**Pre-Activities or Extensions:**

1. Once back at school, have the students trade graphs and answer each other's questions.
  - Use different materials and graph styles to represent the data in different ways.
  - Present the graphs in an overhead and have the students determine similarities and differences in the graphs
  - Discuss the importance of valid estimations for scientists doing animal counting in the wild.
2. Materials:
  - loaf of raisin bread (unsliced if possible)
  - bread knife
  - chalkboard or poster paper.

Place students in small groups of 3 to 6 individuals.

If the loaf is unsliced, slice the bread as evenly as possible by the number of groups and distribute a slice of bread to each group of students.

If the loaf is presliced, distribute an equal number of slices to each group. Have each group count the number of raisins in their portion by tearing the bread apart. Have each group multiply their number of raisins by the number of groups to come up with their estimate of the number of raisins for the entire loaf. Record each group's estimate on the chalkboard.

Ask each group how many raisins were in their group's portion of bread and record the numbers in a column on the chalkboard. Then add all the numbers to find the total number of raisins within the loaf.

Compare the actual number of raisins in the loaf to the estimates from each group. Did any group get the correct answer? Were any groups far off? Discuss what factors might have caused an inaccurate estimate.

Explain that scientists often use this method to estimate the population of various animals within a given area – for example, barnacles within a tidepool region.

3. Apply this method of estimating animal populations to various ecosystems. What would some of the challenges be to using this method in a rain forest, for example? In the desert?

Activities 2 and 3 have been taken and adapted from "Passport to the Pacific: A Guide to Habitats, Inhabitants, and Activities" from the *Aquarium of the Pacific* 2002

**Assessment:**

Use an observation sheet to assess students as they work; showing evidence that they:

- Follow directions
- Are using strategies to estimate numbers in exhibits
- Demonstrate ability to create a clear and informative graph.
- Demonstrate an understanding of presented graphs and the ability to correctly discern information from graphs other than their own.
- Ability to create different graphs to represent a set of data.
- Demonstrate an understanding of the importance of accurate wildlife estimation.

**Aquarium Count**

1. Stay with your group or partner.
2. Guess how many animals in the following groups are in the exhibits you have chosen.

Animal Group	Exhibit # 1 estimate	Exhibit # 2 estimate	Exhibit # 3 estimate
	Exhibit name:	Exhibit name:	Exhibit name:
Reptiles			
Birds			
Amphibians			
Fish			
Invertebrates			
Mammals			

3. Make a graph to show your results.
4. Make up three questions about your graph.
5. Discuss in paragraph form why accurate animal counting in the wild is important, and what impact it may have on human interaction with our environment.