Just How Many Are There?

6672

Introduction

This activity introduces students to the concept of using proportional reasoning to estimate the size of an animal population.

Grades 6-8

NCTM Number and Operations Standards

- Understand numbers, ways of representing numbers, relationships among numbers, and number systems
- Understand and use ratios and proportions to represent quantitative relationships

Files/Materials Needed

Files: ***Capture.act***

Materials: A large and known quantity of beans (or small objects with the same size and shape) in which a sample of known quantity has been marked

1

a. Launch TI-Navigator™on the computer and start the session.

b. Have each student log into NavNet on their calculator.

2

a. Load the ***Capture.act*** activity settings file into Activity Center. This sets up the Activity Center so that students will have two inputs, **TAGGED** and **TOTAL**.

b. Explain to students that animal population sizes are often estimated by tagging a certain number of animals, releasing them into the wild, and tracking the number of animal sightings over time.

c. Ask students to use their imagination that the beans you have (or other small objects) represent a certain type of animal and that some of them have been tagged. Challenge them to guess how many beans are in the jar and use **Quick Poll** to collect their answers.

3

a. Circulate through the room and give each student a sample of the beans. Make sure that there are plenty of beans left over after you have distributed them.

b. Instruct them to count the total number of beans in their sample and the total number that are marked (tagged). Students should input this information under the appropriate heading in Activity Center and select **SEND** to submit their lists to Activity Center.

4

a. Stop the activity and change **Contribute** to *Lists*, click **Configure**, and select the **Existing activity lists** check box. By starting the activity again, each student will receive the entire class data set.

b. Tell students to exit out of NavNet and use the commands **sum**(L_1) and **sum**(L_2) to find the sum of each list. These commands can be found by pressing $\boxed{\text{2nd}}\,\boxed{\text{STAT}}\,\boxed{\blacktriangleright}\,\boxed{\blacktriangleright}\,\boxed{7}$, and then choosing either L_1 or L_2 from $\boxed{\text{2nd}}\,\boxed{\text{STAT}}\,L_S$.

c. Next, reveal to students how many of the beans have been tagged (in the entire population) and ask them to write a proportion to solve for the total population. Depending on the ability level of your students, you may need to show them how to set up the proportion below.

Known by teacher
↓
$$\frac{\text{tagged in sample}}{\text{total sample}} = \frac{\text{tagged in entire population}}{\text{total population (unknown)}}$$
↑
Aggregated class data

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d. After each student has solved their proportion, ask them to type their answer on the home screen. Use **Screen Capture** to see how they did. Share the real answer with the class. The result from class experiment should be very close to the actual total population.

e. Finally, open **Quick Poll**, click on **History**, and select the poll you took at the beginning of the activity. Check to see which student had a guess that was closest to the original number. Perhaps you'll have a prize for him or her!