

# Lesson: Student population

## Phase of learning

Years 5 - 6, Years 7 - 8, Years 9 - 10

## WA Curriculum

K-10 Mathematics, K-10 Science

## Region

North Coast, Gascoyne Coast, West Coast, South Coast, Indian Ocean Territories

## Summary

To manage the marine environment effectively, marine managers need to know the size and composition of animal populations. Students will investigate methods that are used to estimate animal populations, and consider variables and constraints that can affect the confidence of results.

## Outcomes

- Students will estimate the total number of students at the school by taking samples of classrooms.
- Students will demonstrate the importance of taking a representative sample and minimising variables.

## Duration

1 hour

## Steps

1. Engage students in a discussion about how many students attend your school. To count every student at the school what would be some of the difficulties? Can you calculate an estimate without counting every student? When would be the best time of the day to conduct sampling? Why would it be important to know how many students attend the school?
2. Write down an estimate of total number of students.
3. Count the number of active classes at your school.
4. Count the number of student in your class.

### 1. Teacher tip

2. Count the number of actual students present. Do not include absentee students. In ecological studies researchers can only count the animals or plants that are present.
5. Multiply the number of students in class with the number of classes at the school.
6. How confident are you in this result? Does calculating the estimate by using only the student count in your classroom bias the result?
7. This time randomly choose three classrooms at the school. Do this through a raffle by writing the name or number of each classroom on a separate sheet of paper and placing in them in a container. Randomly pick out three classrooms names or numbers.
8. Kindly ask each teacher in these classrooms whether a count can be made on number of students present in the classroom.
9. Did the number across the three classrooms vary considerably? Were they higher or lower than your classroom? Using the results, calculate the average and multiply this by the total number of classrooms.
10. How does this result compare with the previous result?
11. Check with school administration to provide an accurate number of students that are actively enrolled.
12. Compare the actively enrolled students from the estimated result? Convert this into a percentage.
13. Explain any differences, for example, absentee students, students on excursion, students in a different area of the school, classes combined for an activity. Did one or more of the classroom counts bias the results?
14. Explain the importance of maintaining a closed system for estimating population sizes and discuss sampling methods to reduce error.

### 1. Teacher tip

A closed system means no individual animals have died, were born, or moved into or out of the area during the sampling period.

If you were to conduct classroom counts at the beginning of the morning you have the potential capture student numbers before they leave their classroom for excursions or outside activities. If no students are present in a classroom exclude them from the calculation, or attempt to quantify the absentee rate.

15. What methods could be used to count fish and other marine animals in the ocean?

### Keywords

Assumption, biomass, exploitation, migration, mortality, population, proportion, ratio, representative sample, sample variable