

Quadrats Online: Teacher Notes



Eispeth Swan ©

Activity 1

Stake out

Objectives

After completing this activity, students will be able to:

- Record observations of living and non-living things in a quadrat and suggest interactions.
- List the advantages and disadvantages of using a quadrat to represent a whole ecosystem.

Target audience

Levels 3 - 4

Duration

One 50-minute session

Materials

- Student worksheet
- Hula hoop or 1 m² quadrat
- Garden gloves
- Magnifying glass
- Jar or petri dish with lid to collect animals for identification
- Ecolinc Biodiversity of the Western Volcanic Plains Flora and Fauna Field Guide
- Camera (optional)

Activity

This activity will allow students to be outside and explore what is around them. They will learn how to make observations and begin distinguishing between living and non-living things in an ecosystem, and the interactions that occur.

Before beginning the activity

You will need to decide where this activity will be completed. Suggestions could be in the school ground or at a local park.

You will need to discuss random sampling. How do we make sure that we place the quadrat randomly?

At this stage perhaps throwing the quadrat into an area while their eyes are closed would be sufficient for the students.

Students should then begin either drawing or photographing the different types of plants in their quadrat.

Explore student ideas about how we would go about measuring the abundance of different species. What would we measure? How would we measure? What about plants that are growing along the edge of the quadrat?

Students will then be asked to make a note of any animals in their quadrat or any evidence of animals.

Again the ability to take photos would be great. A discussion of what sort of evidence animals may leave would be beneficial.

Carrying out the activity

1. Group students into pairs.
2. Give each pair of students a worksheet, a hula hoop, a jar or petri dish with lid, a magnifying glass and a camera if available.
3. Allow students to randomly place their quadrats, ensuring that no one is in the way when the hula hoops are being thrown.
4. Students should then carry out quadrat sampling and record results in the table provided.
5. Observations should include plants, animals and the non-living factors.

Interpretation of results

1. Why was it important to choose the positions of the quadrats randomly?

If we want to ensure that we have an accurate representation of the ecosystem we need to eliminate bias. Students could give an example of any bias e.g. placing the quadrat next to a path or over an area that has plants that they like etc.

2. How did you decide whether a plant was inside or outside a quadrat?

This is up to the class to decide as a whole. As long as the class uses the same guidelines e.g. more than half of the plant has to be inside the quadrat to be counted. Allow students to discuss and come to a consensus themselves.

3. List some ways in which plants and animals rely on non-living factors to survive.

- Plants rely on sunlight for photosynthesis.
- Plants rely on soil for nutrients, water, and to hold them into the ground.
- Plants rely on oxygen and carbon dioxide from the air.
- Plants rely on water to soften their seed coat so that they can germinate.
- Some animals burrow in the soil for protection.
- Some animals live in amongst rocks or pebbles.
- Animals need oxygen from the air to breathe.
- Animals need water.
- Animals may use rocks for shade or protection
- Any others that the student may come up with that are correct.

4. In what ways do animals need plants to survive?

Animals need plants for food, shelter, shade and protection from predators.

5. In what ways do plants need animals to survive?

Plants need animals for pollination, to spread their seeds, to provide nutrients to the soil either via their wastes or via decomposition when they die.

Conclusion

6. Why are quadrats useful when studying an ecosystem?

Quadrats are useful because often the area you wish to study is far too large. A quadrat is much smaller and more manageable.

7. What may not have been sampled properly using this technique?

This type of sampling does not include larger shrubs and trees that the hula hoop would not fit over. It does not include animals that can move away, although looking for evidence of these animals may help to include some of them.