

# Burrowing Crayfish – Scientific research skills

## 8. Collecting information in the field.



**How do I find Burrowing Crayfish in the Field?**  
**What scientific tools do I use to find them?**  
**How do I record my findings?**

### Lesson Overview:

This session provides students with the opportunity to record the distribution of Burrowing Crayfish communities in their local area. Students become actively involved in monitoring the Burrowing Crayfish populations in their area. Students use scientific tools including measurement tools, monitoring sheets to collect and to record data in the field.

**Key concepts:** Use of appropriate scientific tools to conduct research (Transects, Quadrats, Rulers), variables.

**Teaching strategies:** Think, Pair and Share.

**Equipment & Resources:** Sticky notes, science journals shared research questions, tools for investigation.

**ACARA Curriculum Linkages:** Biological Science refer to curriculum overview.

### Activity Sequence:

**1 hour**

- Engage:** Students are to develop a research question to investigate in the field. As an example whole class will work on development of a shared question. An example of a question may include:
  - How many Burrowing Crayfish are found in a freshwater meadow at a particular site .....?
  - Does the number of Burrowing Crayfish burrows change in a wetland?
  - Does the height of the Burrowing Crayfish chimney entrance change in an area?
  - Does rainfall change the burrows?
  - Do farming practices disturb the Burrowing Crayfish?
- Explore:** Using a **Think, Pair, Share** strategy students will need a sticky note to write down their science question to investigate.

**THINK:** Individually students develop a personal question that they would like their small group to investigate about the Burrowing Crayfish and its habitat?

**PAIR:** Form partners to share your science inquiry question ideas? Select one question to investigate per group. Groups can combine their questions or think of a new question if they have developed on during the conferencing time.

**SHARE:** Your science inquiry question with the class. Record student responses onto the board. Look for similarities. Mid to upper (years 3-6) primary school students may focus on one question for the whole class.
- Explain:** Students suggest ways to plan and conduct investigations and find answers to questions that they have developed for research purposes. What equipment would you need to collect information:  
**QUADRATS and TRANSECTS** as appropriate tools for investigation. Used to reduce the study area size and create a scientifically focused survey and that is easily replicated.
- Elaborate: Variables** are important in creating a fair test and consistency in the monitoring process. Each area must have the same techniques used in the field. By replicating the fieldwork research using tools such as a quadrat and referencing back to the transect line scientific consistency is improved.
- Evaluate: Reflection:** How can we improve our survey techniques in our surveys? Have we reduced our variables to only one? Have we ensured that safety and ethical considerations have been identified and managed?

## **Teachers working example:**

*This session uses whole class discussions, and requires the students to think independently about the data they have been provided with. The use of secondary data is important to give the students experience in using data before they conduct fieldwork investigations themselves. This process enables the students to be mindful in the process of data collection and how the data will be used to 'tell an ecological story' about the distribution of the Burrowing Crayfish.*

*Familiarise yourself with the use of scientific tools (Transects and Quadrats) and the importance of reducing variables to conduct a 'fair test' before beginning the session. This will provide you with the types data that is to be discussed during the session.*

*The aim of the session is to involve students in developing Science Inquiry Skills in planning and conducting fieldwork research. The students are setting their own questions to investigate and discussing appropriate scientific tools to use to conduct the fieldwork research. This enables the students to begin to design their own research, gaining hands on skills in problem solving and identifying the issues associated with data collected and safety concerns and ethical issues that may arise.*

### **Scientific Methods and tools:**

**Transects and Quadrats:** *Are scientific tools used in research. A **transect** is a line that is used to keep a reference point for field observations. It can denote the distance from an ecological feature or be used to set up to provide a reference point.*

**Quadrats** *are used to make a quantitative count of objects in a known area. This allows for a fair test to be conducted in a given area. The quadrat allows field studies to be replicated and kept consistent for comparison.*

**Variables:** *It is important in all scientific studies that different variables are reduced or controlled in experiments and in fieldwork. In fieldwork we can reduce variables by using the scientific research tools such as; a transect or a quadrat. This will allow for a fair comparison to be achieved when conducting the fieldwork. Without limiting variables in research it is not possible to compare and contrast information received. For example: Using a quadrat refines the search area to a known area and makes sure that I complete an accurate count of burrows and I am not stretching my sampling area because 'I saw some over there...' The quadrat is usually 1m by 1m but can be scaled up or down as long as the size surveyed is kept the same for each of the areas surveyed. The transect line allows another variable to be reduced it allows for observations to be recorded over a distance in a defined area. This enables scientists to draw conclusions from a known area. A random approach may be adopted with no transect line in use, however the research method must be kept the same (ie. Throwing a ball and placing the quadrat at that spot). Random approaches are difficult to achieve and limit the research ecological story that could be told about the habitat.*

Students can use the scientific fieldwork planning and preparations sheet to record their science investigation question, tools for research and methods.

## Scientific fieldwork planning and preparations

Name:

Group:

**Our research question is:** clearly describe what it is you are investigating.

**Our Equipment needed:** What we need to complete the fieldwork?

**Our methods:** We plan to undertake our survey by? How are you going to conduct your survey?

**Reducing our variables:** What are we going to do to keep our methods the same? Think about quadrat placement, using rulers and transect lines.

**Our Data collection:** How we are going to collect our information in the field? Tables monitoring sheets etc.

**Field work designs:** How you will set up your research in the field? Draw a labelled diagram to illustrate this. Include the transect line, quadrats and the different measurements you will make.