

# Hermit Crabs Are Drawn to the Dead

## Activity Guide for Students: Getting Source Savvy

**Directions for students:** The *Science News* article "[Hermit crabs are drawn to the dead](#)" reports on the findings of the primary research paper "[Scent of death: Evolution from sea to land of an extreme collective attraction to conspecific death](#)," published open access in *Ecology and Evolution*.

In this activity, you will explore how specific steps of experimental design are reported in a journalistic article (*Science News*) versus a primary research paper (*Ecology and Evolution*). Your teacher will divide the class into groups and assign one step of the experimental design process to each group; you can find the questions for your group below. Answer the questions on sticky notes, with one color for the *Science News* article and one for the primary research paper.

Once your group has answered its questions, your teacher will tell you where to place your sticky notes throughout the classroom. Then, you'll take a gallery walk with a partner from a different group to read your classmates' answers. As you walk, think about the general similarities and differences between the two reports for each experimental design step, including your own assigned step. Back at your seats, you and your partner will collaboratively write the answers to the second set of questions below.

### Group questions:

#### Group I. Determining an initial focus by choosing an answerable question and conducting background research.

1. What background information is given about the research topic?
2. Where and to what extent is the background information presented by the author?
3. What general level of scientific vocabulary is used to explain the background information? Give a specific example from each article.
4. What overall scientific question was the research addressing?

**Group II. Developing a hypothesis from the proposed question, defining variables and determining the kind of data that needs to be collected.**

1. What quantitative data was collected to address the research question? Give an example.
2. What qualitative data was collected to address the research question?
3. What experimental variables were used in the research?
4. Identify the factor(s) or variable(s) that were manipulated — the independent variable. Identify the factor(s) or variable(s) that were measured — the dependent variable.
5. Identify the hypothesis that was tested in the research. Are you able to tell if it's non-directional or directional? Explain.

**Group III. Determining a method to evaluate data collected and the potential errors that will need to be controlled for by the procedure.**

1. How was the data evaluated? Were analysis techniques discussed?
2. Name and define at least one statistical test used.
3. How did researchers try to minimize errors? Explain.

**Group IV. Developing and performing a procedure to collect the necessary data.**

1. Briefly describe the procedure used to conduct the research.

2. What experimental conditions and controls were used?
3. How many trials were run? Be as specific as you can be.
4. Did the procedure try to minimize potential errors and create reproducible results? Explain.
5. Was the procedure used safe and ethical? How do you know?

**Group V. Analyzing and presenting the results.**

1. How was the data displayed? Be as specific as possible.
2. How and where were the results stated in each article? Was the overall hypothesis correct or incorrect?
3. How was the experimental error accounted for? Explain.
4. What didn't go as planned in the experimental process? How did these errors affect the results? What could be done in the future to minimize unwanted errors?
5. What additional experiments might researchers want to conduct in the future based on the results of this study?

### **Gallery walk questions:**

1. What aspects of experimental design are covered in both reports? Give an example. What are the major differences in how experimental design is covered in the articles? Give an example.

2. Who is the author and what relationship does he/she have with the research experiment performed? How does the author's relationship affect how the content is presented?

3. What audience is the author writing for? Based on the intended audience, what is the overall goal of each report? How does the goal of the report influence what material is presented, including the depth of the experimental design?