

Circle J-Norris Ranch Exploring for Insects & Spiders Grade Five



Goal: To demonstrate for students the steps involved in a simple scientific experiment. Students will compare 2 different areas (sunny vs. shady or their own variable) to see which area insects and spiders prefer. They will explore the diverse types of insects & spiders that live in the grasslands and woodlands of Circle J -Norris Ranch.

Objectives: Each student will:

- a.) Treat all creatures carefully and with respect (no smushing!)
- b.) Describe 3 differences and 3 similarities of spiders and insects
- c.) Make a conclusion based on data findings.

Grade Five Science Content Standards- Investigation and Experimentation

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
- a. Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.
 - b. Develop a testable question.
 - c. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.
 - d. Identify the dependent and controlled variables in an investigation.
 - e. Identify a single independent variable in a scientific investigation and explain how this variable can be used to collect information to answer a question about the results of the experiment.
 - f. Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.
 - g. Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.
 - h. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion

Materials:

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| <input type="checkbox"/> 6 white cotton sheets | <input type="checkbox"/> Data sheets |
| <input type="checkbox"/> 6 Insect collection tanks | <input type="checkbox"/> Graph paper, many colored markers |
| <input type="checkbox"/> Many insect cubes and magnifiers | <input type="checkbox"/> Pencils |
| <input type="checkbox"/> 12 Insect nets | <input type="checkbox"/> Clipboards |
| <input type="checkbox"/> Insect field guides | |

Assessments: Venn Diagram (artistic) of insect & spider similarities and differences
Bar Graph of the results of scientific investigation

Safety and Care

- * Please demonstrate gentle use of the insect nets so that nets do not get battered. Any child acting in an unsafe manner will have their net taken away.
- * Please demonstrate gentle handling of insects and careful closing of the insect cubes so that no insect legs become damaged.
- * THANK YOU for BEING CAREFUL!!!

Getting Started: Divide the group of students into 6 smaller groups.

- 1.) Greetings Insect Scientists (entomologists) and Spider Scientists (arachnologists)! Today, we are going to be exploring the insects and spiders that live in the grasslands and woodlands of Circle J-Norris Ranch. We are going to perform a real *scientific experiment*. Before we can begin our experiment, I want to be sure we can all tell the difference between an *insect* and a *spider* because you are going to have to count both insects and spiders accurately. In your small groups you have been given a diagram of an insect and a spider. **ACTIVITY:** I want each group to discuss, and then list the similarities and differences of insects and spiders you observe or you already know about. [After the groups have discussed for 3 or 4 minutes, do round robin with one comment per group until the salient differences have been exposed.] Now we know how to make observations and tell the difference between insects and spiders!
- 2.) Now we are ready to begin our scientific experiment. Science is all about wondering and asking questions, then designing experiments to answer your questions. I have a question I have been wondering about: Where are we most likely to find insects and spiders at Circle J? Do insects and spiders prefer to live in sunny places (point out a sunny grassland area) OR do they prefer to live in shady areas (point out a shady woodland)? Today, we will perform an investigation to find out if insects and spiders prefer to live in Sun or Shade.
- 3.) A hypothesis is making an educated guess. First, what do you think? Do you think we will find more spiders in the sun or in the shade? **ACTIVITY:** Ask the students & their chaperone to discuss and share ideas about whether insects might prefer sun or shade. Repeat for spiders. Mark predictions on the data sheet.
- 4.) Our **DEPENDENT VARIABLE** is "Sun vs. Shade". Designate 3 teams to collect and count insects and spiders from a sunny area and 3 teams to collect and count from a shady area. Carefully point out the boundaries of the 2 distinct areas and be sure each team knows where to collect.
- 5.) Demonstrate proper use of a net (before you hand out nets) - **Gentle** sweeping back and forth. One **CONTROLLED VARIABLE** is the amount of time each study team collects. This will be a timed collection so that all teams have been collecting for the exact same period of time. You start collecting when I say "start" and stop when I say "Finish". Flip the net over onto itself to trap insects [Demonstrate this]. Then empty the contents of the net carefully into the collection tank. Count and record the number of insects and then count and record the number of spiders before you release them.

- 6.) Hand out nets- usually one net to 2 students. Announce that you will call the start and finish times and that each student will have a chance to use the net because you will repeat the collections **twice**. Pass out all the data collecting material to chaperones and **GOOD LUCK!**
- 7.) **ACTIVITY:** Students collect insects & spiders for 1 minute & place in collection tank. Switch net to other student & they collect for 1 minute. Then both students begin the task of counting their catch. Teacher patrols the area being sure students are being gentle with the nets, are following start and finish times & are accurate in their counting and recording.
- 8.) After a fairly accurate **count** is taken and recorded, have the students record their data. Demonstrate to the whole group how to make a bar graph. Outline the bar graph in a bright color. Explain that they must make one bar for insects and one for spiders. [Remember, at this point they will only have data for one area- either sun or shade.] (Give groups about 5 minutes to do this).
- 9.) Now pair each "Sunny" group with a "Shady" group and have them share data with each other so that every group has a complete graph of Spiders in sun & shade and Insects in sun & shade. (Give students another 5 minutes to do this).
- 10.) Now our results are graphed and we can make conclusions. A conclusion is when you look at our data and see if it helped us answer our question. Ask each group to discuss their findings. Do insects prefer sun or shade? How do you know? Do spiders prefer sun or shade? How do you know? Do all groups agree? If not, how can we improve this study to find out?
- 11.) Next, explain that they now may release the insects and spiders onto the white sheet and show students how to **carefully** place them in the magnifying cubes. Stress that they must be careful not to trap or pinch their fragile legs when they place the top on the cube. Point out that they may use the insect field guide to figure out what they have caught.
- 12.) Wrap-up by collecting the data sheets, the nets & having the students carefully release all remaining insects in the area (sun or shade) where they found them. Collect the data sheets (check for names) and the corresponding bar graphs they have constructed.

After you capture an insect, a twist of the net can prevent its escape!

