Background

Farmers pay attention to the weather for many reasons. They want to know when it’s going to rain so they will know when to irrigate. They want to know when it’s going to freeze so they can protect crops that don’t tolerate the cold. They also want to know how to use the weather to control the pests that might damage their crops.

Since some insect problems could get worse at predictable times of the year, many growers time their planting to protect their crops from those high risk periods. The Hessian fly, for example, is a minor pest for some Oklahoma wheat growers. Prevention is the only way to control it, so wheat growers are advised to put off planting until after a “safe-seeding” or “fly-free” day set by the Oklahoma Agricultural Experiment Station. To avoid corn earworm damage, some corn growers may plant varieties of sweet corn that mature early, before the corn earworm moths begin laying eggs. Since grasshoppers lay their eggs in the soil, and the eggs cannot survive freezing temperatures, growers may turn the soil over in the fall to expose the eggs to the cold.

Cricket species is a direct relationship between the rate of chirps and temperature. To determine the temperature where a cricket is sitting, count the number of chirps in a 15-second interval and add 37. Chirping is annoyance enough for some homeowners, but crickets may also destroy house plants or eat holes in paper, rubber and garments made of cotton, linen, wool or fur.

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raising crickets.

Crickets are not popular pets in the United States, but recently some farmers have begun raising crickets as a source of live food for pet lizards and other reptiles and amphibian. Live crickets are also in demand as fish bait.

Activities
1. Students may work individually or in small groups.
   — Students will collect live crickets and bring them to class. You may also purchase live crickets from a pet store that sells them as food for pets.
   — Students will share what they know about crickets. Where did they find the crickets they brought to class? What do crickets need to survive?
2. Read and discuss background information and vocabulary.
   — Ask students what effect the cold has on crickets. Students will be conducting an investigation to answer that question.
   — Discuss the scientific method and explain that the scientific method usually involves two tests, one in which all conditions are normal (the control) and another in which one and only one part is different from the normal (the experimental). The results of the experimental test are compared with the results of the control test to answer a specific question.
   — Each student will divide his or her crickets between the two water bottles and cover them with the pantyhose. Students should write their names on the bottles and label one bottle “control” and one bottle “experimental.”
   — Cut two or three apples into small slices, and provide each student or group with a slice for each bottle.
   — Students will use a beam balance to weigh the apple slices before placing them in the bottle. Weights should be recorded on the chart provided.
   — Students will place a damp paper towel in each bottle.
   — Provide thermometers for students to measure the temperature inside each bottle. Students will record the temperature on the student worksheet.
   — Students will place the bottles marked “experimental” in a refrigerator or a designated place outdoors, if the weather has turned cold.
   — For the next three days, students will check their crickets and record observations on the student worksheet.
   — Students may write additional observations on the backs of the worksheets, e.g., the positions of the crickets, activity levels, color changes, odors, growth, etc.
   — At the end of the fourth day students will use the observations from their worksheet to complete a formal report, using the “Scientific Method” outline provided with the lesson.
   — Students will discuss their conclusions as a class.
3. Lead a discussion about possible uses for this kind of information in planning pest control methods in food production?
4. Over the four days students are observing their crickets (Activity 2), read and discuss Charles Dickens’ short story, “A Cricket in the Hearth.”
   —In the story, Mary Peerybingle proclaims, “To have a cricket on the hearth is the luckiest thing in all the world,” For Mary the cheerful cricket’s song symbolizes her happy home. For Tackleton, the toymaker, the cricket’s song is an irritating noise to which he responds by “scrunching ‘em” under his heel. Discuss the idea that what is a pest in one situation might not be a pest in another situation. Relate the discussion to the need to consider advantages and disadvantages before killing pests.

5. Students will use online search engines or library references to research integrated pest management and relate this method of pest management to the discussion in Activity 4.

6. Students will write stories or poems with their crickets as the main characters.

Extra Reading
Dorin, Paul, Crickets on the Moon, Trafford, 2006. (Young Adult)

Vocabulary
accidental—unintentional, unplanned
annoyance—irritation, a bother
corn earworm—a large striped American moth larva that feeds destructively on corn, tomatoes, cotton bolls, and many other plants
equated—considered as equivalent to something
forewing—either of the pair of front wings on a four-winged insect
Hessian fly—a small fly destructive to crops, especially wheat, barley and rye
invader—attacker; trespasser
myth—a legend, fable, parable, or fairy tale
predictable—obvious, expected, unsurprising
superstition—a belief or practice generally regarded as irrational
1. What question/hypothesis are you trying to answer/prove with this investigation.

2. List all the materials you used.

3. Procedure (Explain what you did.)

***Check your crickets each day and use the chart below to record your observations. Use the back to write additional observations.

<table>
<thead>
<tr>
<th>Day One</th>
<th>Control Test (normal cricket bottle)</th>
<th>Experimental Test (cold cricket bottle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
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<tr>
<td>Number of crickets alive</td>
<td></td>
<td></td>
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<tr>
<td>Number of crickets dead</td>
<td></td>
<td></td>
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<tr>
<td>Weight of apple slice</td>
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<tr>
<td>Day Two</td>
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<tr>
<td>Temperature</td>
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<td>Number of crickets alive</td>
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<tr>
<td>Number of crickets dead</td>
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<tr>
<td>Weight of remaining apple</td>
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<tr>
<td>Day Three</td>
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<tr>
<td>Temperature</td>
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<td>Number of crickets alive</td>
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<td>Weight of remaining apple</td>
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<tr>
<td>Day Four</td>
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<td>Temperature</td>
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<td>Number of crickets alive</td>
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<tr>
<td>Number of crickets dead</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight of remaining apple</td>
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</tbody>
</table>
Scientific Method Format

Title of Experiment or Study:

I. Stating the Problem:
   What do you want to learn or find out?

II. Forming the Hypothesis:
    What is known about the subject or problem, and what is a prediction for what will happen?

III. Experimenting: (Set up procedures)
    This should include: materials used; dates of the experimental study; variables, both dependent and inde-
    pendent (constant and experimental); how and what was done to set up the experiment; fair testing proce-
    dures.

IV. Observations:
    Includes the records, graphs, data collected during the study.

V. Interpreting the Data:
    Does the data support/defend the hypothesis?

VI. Drawing Conclusions:
    Justify the data collected with concluding statements about what has been learned. Discuss any problems or
    concerns. Use other studies to support the conclusion. Give alternative ideas for testing the hypothesis.

Oklahoma Ag in the Classroom is a program of the Oklahoma Cooperative Extension Service, the Oklahoma
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