

NatureMapping Program
4th Grade Horny Toad Project

Modules	Life Sciences	Math	Technology
<p>1. Scientific question How do the horny toads & farmers live together successfully? (comparative & correlative study)</p>	<p>Hypothesis: Horny toads live in farm fields</p>		
<p>2. Project Design (Identify a Setting within a System and Identify variables of Interest) What you are going to do?</p>	<p>Identify the source of energy & matter used by animals to grow & sustain life. Identify the habitats they use Identify farming practices in the Waterville Plateau</p>	<p>Collect horny toad data from farmers Identify the distance horny toads move daily. Identify the age of the horny toads in the fields</p>	<p>Radio collar horny toads and track them. Students will take digital pictures, GPS locations of collared lizards Publish results on the website & submit data to <i>NatureMapping</i> Make maps for farmers</p>
<p>3. Methods (Collect Data) How you are going to do it?</p>	<p>Students will collect data from home and interview their farmers about the sightings. Students will learn about food preferences, and other life history information about horny toads. Using prior data, students will compare information collect in shrub-steppe with farm fields</p>	<p>Using farmer data create graphs (start with paper, then advance to Excel) based on time of day, month, temperature and size Analyze multiple year data and multiple factors on one graph (e.g., snow and observations) Using ArcView, learn how to query multiple data variables for maps and graphs.</p>	<p>Internet to find information and details about horny toads. GPS locations will be entered into Excel. Farmers will digitize their observations and students will enter their data into Excel. Maps will be made using ArcView Use radio receivers to track lizards and data loggers for winter soil temperatures.</p>
<p>4. Data Analysis - Results What did the data tell you?</p>	<p>Example: 3rd grade data on insects-beetles are a favorite food. Horny toads live longer in farm lands than shrub steppe, because there are less predators. Farming practices are not hurting the lizards</p>	<p>Example: Horny toads are found in farm fields, but usually closer to scab patches. Horny toads are found in the fields during the later part of the day. Use temperature graphs to show horny toads freeze during the winter</p>	<p>Maps show where the sampling occurred. Use maps and graphs to show why horny toads live (or don't live) in fields</p>
<p>5. Discussion (Use Evidence to Support an Explanation) Why do you think you got the results that you did?</p>	<p>Data collected is helping learn more how the farmers and horny toads live together.</p>	<p>Collecting data in different locations next year will prove our theory</p>	<p>Can technology support your best guess that horny toads freeze or stay in scab patches?</p>

NatureMapping Program
4th Grade Horny Toad Project

Modules	Reading/Writing	Art	Social Studies
1. Scientific question How do the horny toads and farmers live together successfully? (comparative & correlative study)	Hypothesis: Horny toads live in farm fields		
2. Project Design (Identify a Setting within a System and Identify variables of Interest) What you are going to do?	Students will learn new science related vocabulary. Develop a sequence of events in the day of the life of a horny toad using field guides and Internet	Draw pictures of the habitats and trace all transfers of energy in a system	Learn how to read maps, use GPS units, aerial photography, how to find Township Range and Section and latitude and longitude.
3. Methods (Collect Data) How you are going to do it?	Students will design the data collection form for the farmers. Students will use a professionally designed form for radio collaring. Students will create a poster explaining how to catch a horny toad	Draw and label a scientific illustration of a horny toad and use the correct vocabulary to describe it. Students can either create a cartoon, write a song, design a web page with the horny toad habitats and other species (e.g., birds, butterflies, insects)	Collect GPS locations from homes. Use topographic maps and ArcView to teach geography. Make aerial photo maps for the farmers of their fields. Provide geographic information on those maps.
4. Data Analysis - Results What did the data tell you?	Write the results for the website and in powerpoint for presentations.	Students will create posters based on a selected topic about the horny toads	Create maps for the farmers that show horny toad sightings.
5. Discussion (Use Evidence to Support an Explanation) Why do you think you got the results that you did?	Students will discuss their results for the web site.		