



pets in the  
classroom

# Guinea Pig Sensory Experiment

<b>Adapted from</b>	<a href="#">Alexandra Vasile School: Arkansas Arts Academy Grade range: 6th - 9th grade Subject: Science Topic</a>
<b>Pet:</b> Designed for guinea pigs, but easily adapted to other pets.	<b>Class:</b> 6-9 <b>Subject:</b> Life Science

<b>Brief Overview:</b> In this two part experiment, students will test how guinea pigs respond to various changes in their environment. They answer the question Do environmental stimuli affect how a small animal performs a task? <b>Easily adapted to other grade and pets</b>	<b>Lesson Breakdown</b> <b>Lesson 1:</b> Observations about Bedding <b>Lesson 2:</b> Build a maze <b>Lesson 3:</b> Design an Experiment: How do changes in sight, sound, touch or smell affect the guinea pig's performance? <b>Lesson 4:</b> Conduct the Experiment <b>Lesson 5:</b> Analyze the results and complete a CERJ
<b>Essential Question</b> How do different environmental stimuli affect the behavior and performance of guinea pigs as they navigate and interact with their surroundings?	

<b>Subjects</b> <input checked="" type="checkbox"/> Science <input type="checkbox"/> ELA <input checked="" type="checkbox"/> Math <input checked="" type="checkbox"/> STEM <input type="checkbox"/> Art <input type="checkbox"/> Other	<b>Stem Connections</b> Science: Planning and Conducting an Experiment Technology: Stopwatches, Online 3D modeling software (optional) Engineering: Building the maze Math: Data gathering, calculating average, creating graphs
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## Performance Expectations/ Standards

### NGSS

**MS-ETS1-2** Engineering Design. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

**MS-ETS1-4** Engineering Design. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

### CCSS

**ELA.W.6.1** Write an argument to support claims with clear reasons and relevant evidence.

**ELA.W.6.2** Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately.

**ELA.RI.6.8** Delineate and evaluate the argument and support in a text, distinguishing claims from facts

**MATH.6.SP.2** Investigate statistical concepts to answer questions about a population

## I CAN statements

- I can carefully compare different design ideas to figure out which one best solves the problem, considering the requirements and limitations.
- I can create a model to collect data that helps me test and improve a proposed object, tool, or process. This way, I can keep making it better until it works really well.

## Materials

### [Testing Guinea Pig Reaction Student Worksheet](#)

Cardboard or large sheets of paper

Scissors

Tape or glue

Markers or colored pencils

Small cardboard boxes or tubes (optional)

### Teacher Background

Guinea pigs, also known as cavy, are small, sociable rodents that make delightful pets. Originating from the Andes region in South America, these gentle creatures have been domesticated for over 7,000 years. Renowned for their docile nature, guinea pigs thrive in social groups and often form strong bonds with their owners. Characterized by their rotund bodies, short legs, and distinctively squeaky vocalizations, guinea pigs come in various breeds and coat types, ranging from smooth to long and silky. Their diet mainly consists of hay, fresh vegetables, and pellets rich in Vitamin C, an essential nutrient for their well-being. Providing ample space, a clean environment, and regular interaction contribute to their happiness. Due to their friendly disposition and relatively simple care requirements, guinea pigs are popular pets, particularly among families and individuals seeking a charming companion.

Choosing the right bedding is crucial for their comfort and well-being. Aspen shavings, paper-based bedding, and fleece liners are popular choices. Aspen shavings are soft and absorbent, providing a cozy environment, while paper-based bedding is dust-free and ideal for those with allergies. Fleece liners, a reusable option, offer a soft surface and are environmentally friendly. Whichever bedding is selected, regular cleaning and maintaining a dry environment are essential for the health of these charming rodents. Always consider your guinea pig's preferences and any sensitivities they may have when selecting bedding for their habitat.

### Lesson 1: Conducting an Experiment

Time	Materials	Activity
10 min		<p>Conduct a class discussion about conducting an experiment that includes:</p> <p><b>Reliability:</b> The teacher will ask students about reliability in testing. Can we rely on the results of a one-time experiment? The answer is no, because the result may be due to chance. That is why students should have at least three trials of the same experiment, in order to ensure reliability of results.</p> <p><b>Control:</b> The teacher will ask students how they can know if the outcome of the experiment is the result of the intervention or simply a matter of randomness? Students should identify that two groups are needed to compare the results. One will be the experimental group and the other will be the control group</p>

		<p><b>Constants:</b> The teacher will ask the students how they can ensure that the effect of the independent variable is the only aspect being measured. Students should be able to respond that we can ensure reliability of results by keeping all other variables constant.</p>
10 min		<p><b>Introduce the problem:</b> Guinea pigs may respond differently to various types of stimuli in their environment. In this experiment, we will observe whether sight, sound, touch or smell affect a guinea pig's performance of a task.</p> <p>Guide students to identify the different stimuli to test and to choose one of the variables for their experiment.: (suggestions are included below)</p> <ul style="list-style-type: none"> <li>• Sight: no obstacles in the maze</li> <li>• Sound: whenever it makes a correct choice in the maze the guinea pig will be rewarded with a sound</li> <li>• Touch; the guinea pig will be aided by small adhesive pads that will guide it to the correct way out</li> <li>• Smell: the guinea pig will be able to smell a strong odor (like eucalyptus) along the correct path out.</li> </ul>
25 min		<p>Have students craft a guinea pig maze blueprint, incorporating features like tunnels, obstacles, and open spaces. Provide materials such as cardboard or sizable sheets of paper for translating their designs into tangible mazes. Encourage creative expression while ensuring the maze accommodates guinea pig movement and exploration. Have them think about incorporating small cardboard boxes or tubes to create additional features.</p> <p><b>Guidelines:</b> Set the wall height just above their heads, and ensure the alleyways are wide enough for easy turning. Introduce a larger area at the beginning where guinea pigs can choose to linger if they are hesitant to proceed. Aim for a minimum of a three-foot square for ample guinea pig mobility and to allow for the incorporation of partitions.</p> <p>OPTIONAL: Have the students design the maze using a3D modeling, online software program such as TInkerCAD.</p>

## Lesson 2: Build the Maze

Time	Materials	Activity
45 minutes	Cardboard or large sheets of paper Scissors Tape or glue Markers or colored pencils Small cardboard boxes or tubes (optional)	<p><b>Gather Materials:</b> Collect cardboard or large sheets of paper, scissors, tape or glue, markers or colored pencils, and any additional materials for added maze features.</p> <p><b>Cut and Assemble:</b> Using scissors, cut out the maze elements according to your design. If using cardboard boxes or tubes, cut them to fit into your maze structure. Assemble the cut pieces, connecting them with tape or glue to form the maze structure.</p> <p><b>Add Details:</b> Use markers or colored pencils to add creative details to your maze. Consider decorating the walls or adding labels to different sections.</p> <p><b>Test the Maze:</b> Place your guinea pig inside the maze and observe its movement. Ensure that the pathways are wide enough for the guinea pig to move comfortably and that there are no sharp edges.</p> <p><b>Make Adjustments:</b> If needed, make adjustments to the maze based on your guinea pig's behavior. Add or rearrange elements to create an engaging and safe environment.</p>

## Lesson 3: Design an Experiment:

Time	Materials	Activity
30 minutes	<a href="#">Testing Guinea Pig Reaction Student Worksheet</a>	Have students complete the worksheet up to the point where they will test the guinea pig. <a href="#">Testing Guinea Pig Reaction Student Worksheet</a>
15	Mazes	Have the students test the guinea pigs time in the maze

minutes	Stopwatches	without any distractions/ variables.
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<b>Lesson 4: Conduct the Experiment</b>		
<b>Time</b>	<b>Materials</b>	<b>Activity</b>
45 minutes	Mazes Stopwatches <a href="#">Testing Guinea Pig Reaction Student Worksheet</a>	Have the students test the guinea pigs time in the maze with the variables. The worksheet requires the students to share their results with each other. This will allow them to determine which of the variables affects the guinea pigs the most..

<b>Lesson 5: Analyze the results and have the students complete a Claims-Evidence- Reasoning- Justification</b>		
<b>Time</b>	<b>Materials</b>	<b>Activity</b>
45 minutes	<a href="#">Testing Guinea Pig Reaction Student Worksheet</a>	Give students time to analyze the results and complete the worksheet

**Differentiation**

**For students who need additional support:**  
You may wish to conduct the experiments together as a class and to limit the number of variables.

**For students who need additional challenges:** Have the students test variables in combinations (such as sight and hearing)

### **Assessment**

Students will complete the worksheet which will have a data table, graph and analysis questions.

An assessment rubric is located here:

[Testing Guinea Pig Reaction Lab Report Rubric](#)

### **Extension**

To extend this lesson, have the students test the variables again to see if the guinea pig “learns” one of the variables and begins to complete the maze more quickly.

Have the students change the variables- for example if they clapped for the sound variable, have them instead whistle for the sound variable.