



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Benjamin W. White</b>	<b>Project Number</b> <b>J2431</b>
<b>Project Title</b> <b>Crustacean Location: Which Factors (Soil Type, Moisture, Light) Influence Where a Pill Bug Makes Its Home?</b>	
<b>Objectives/Goals</b> To test my hypothesis that pill bugs will seek moisture in their environment over light (color or darkness) and soil type. My hypothesis is based on the fact that a pill bug's respiratory system uses gills and gills require water.	
<b>Abstract</b> My project used a characteristic of how animals respond to their environments called kinesis. I built a test chamber divided into four quadrants to test different environment factors. I conducted three studies to test three factors; moisture, light, and soil type. In each study, I placed five pill bugs in each quadrant and at ten minute intervals observed and recorded the number of pill bugs in each quadrant. Study 1 tested for light and moisture (white light and wet soil, white light and dry soil, dark and wet soil, and dark and dry soil). Study 2 tested different types of light (no light, yellow, UV, and white light) and Study 3 tested soil types (mulch, sand, topsoil, and plastic).	
<b>Methods/Materials</b> My project used a characteristic of how animals respond to their environments called kinesis. I built a test chamber divided into four quadrants to test different environment factors. I conducted three studies to test three factors; moisture, light, and soil type. In each study, I placed five pill bugs in each quadrant and at ten minute intervals observed and recorded the number of pill bugs in each quadrant. Study 1 tested for light and moisture (white light and wet soil, white light and dry soil, dark and wet soil, and dark and dry soil). Study 2 tested different types of light (no light, yellow, UV, and white light) and Study 3 tested soil types (mulch, sand, topsoil, and plastic).	
<b>Results</b> In Study 1 (light/moisture), the highest number of pill bugs was in the dark and dry quadrant and not the wet environments. In Study 2 (type of light), the highest number of pill bugs was in the dark (no light) quadrant. In Study 3 (soil type), I found the highest number of pill bugs in the mulch quadrant.	
<b>Conclusions/Discussion</b> My results did not support my hypothesis. Although the pill bug respiratory system uses gills which need water, the pill bugs in the experiment preferred a dry and dark environment. My results showed that pill bugs prefer darkness over other types of light, even light it can't sense, and soil with lots of organic matter. The pill bug's priority for these factors may be derived from their survival instincts for food (organic matter) and protection from predators (no light). This is likely due to a pill bug's finding a plentiful food source in organic matter and their need for protection from predators that could hunt them in the light. The information learned from this project expands our knowledge about the pill bug's unique anatomy, and more importantly, how its survival instincts influence its choice of environment.	
<b>Summary Statement</b> To determine which environmental factors are most influential in a pill bug's selection of environment: moisture, light, soil type.	
<b>Help Received</b> Parents helped with purchasing of supplies, construction of test chamber and final editing of report.	