

# OUSDK-12 ScienceFair

## Scientific Investigation

### What is a Scientific Investigation?

Scientific Investigations are controlled experiments in which only a single variable is changed. In an investigation, you decide on an investigable question, make a plan for how you will test the question, gather the appropriate materials, make a prediction based on your prior experience, and then collect your data, either quantitative or qualitative. You then use your data to make claims and build explanations from your evidence. Then you can answer your original question and reflect on your learning process. Scientific investigations may be original or duplicate an existing experiment to confirm a result.

### Where can I find scientific investigations embedded in FOSS?

Grade	Example Scientific Investigations
K	<ul style="list-style-type: none"> <li>• What will a snail glide over? Based on this, what is the ideal design for a snail habitat?</li> <li>• How do pillbugs and sowbugs react when they feel threatened?</li> <li>• How does a tunnel in the aquarium change goldfish behavior?</li> <li>• How do worms react to blocks in their pathway?</li> <li>• How do different types of food or trash decompose in X amount of time?</li> </ul>
1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• What is the optimal amount of water a type of seed needs to germinate?</li> <li>• How does warm v cold affect the growth of bulbs?</li> <li>• How does gravity affect plant stem growth?</li> <li>• How do grass seeds change over time?</li> <li>• How do different seedlings react to being mowed?</li> <li>• How does light v dark (or warm v cold) affect how grass seeds germinate? Grow?</li> </ul>
2 <sup>nd</sup>	<ul style="list-style-type: none"> <li>• How does the number of seeds in the habitat (cup) affect seed germination? Seed growth?</li> <li>• Does air temperature affect meal worm molting speed? Speed of metamorphosis?</li> </ul>
3 <sup>rd</sup>	<ul style="list-style-type: none"> <li>• Where do crayfish prefer to be in their habitat (corner/middle/edges? Under a cover v out in open?)</li> <li>• How is crayfish feeding behavior different feeding alone v feeding in presence of other crayfish?</li> <li>• How does soaking time affect seed germination?</li> <li>• How does a bean seed change over time?</li> </ul>
4 <sup>th</sup>	<ul style="list-style-type: none"> <li>• What is the preferred environment (light v dark? wet/damp/dry? warm/room temp/cold) for beetles? For isopods?</li> <li>• How does salinity affect brine shrimp hatching?</li> <li>• How does amount of water affect seed germination?</li> <li>• How does salinity affect plant growth?</li> </ul>
5 <sup>th</sup>	<ul style="list-style-type: none"> <li>• How does exercise affect heart rate? Respiration rate?</li> <li>• Is resting (or exercise-induced) heart rate or respiration rate different by gender? By age?</li> <li>• How does amount of sugar or amount of light affect carbon dioxide production in yeast?</li> <li>• How is water transported through plants?</li> <li>• How much do plants transpire based on location?</li> </ul>