

## Sample Inquiry Questions

Note: The following questions are given to you as a pool of ideas, but are by no means comprehensive. They should give you an idea of possible inquiry-style questions. Questions are not grouped under any particular science—they were randomly generated by Mr. Chuck Morlan over the course of several years. You will find that some of the questions' wording needs to be altered to improve their "testability". Questions avoid a "yes" or "no" answer, and can be modified to accommodate older or younger learners.

### Idea cluster #1

1. Electromagnet: How will the number of winds affect the magnet's strength?
2. Wind-up car: How will different surfaces affect how far the car can travel?
3. Mirrors: How do different kinds of mirrors affect the "footprint" of a laser beam?
4. Magnet Strength: How does the number of times a piece of steel is stroked with a magnet affect its strength?
5. Pulse: How does a timed-test affect your heart rate compared with an un-timed test?
6. Sound: How is sound affected by different materials?
7. Flight: How does the shape (or length) of helicopter blades affect how fast the helicopter falls?
8. Heat: How does temperature affect the size of a balloon?
9. Air resistance: How does shape of an object affect its movement in response to moving air?
10. Oxidation: How do different liquids affect the rusting of a metal?
11. Energy: How does the temperature of a ball affect its bounce?
12. Pitch: How does pitch affect a sound-wave pattern?
13. Air pressure: How does air pressure affect the size of an air-filled object?
14. Energy: How does temperature of water affect the speed of a liquid compound mixing in water?
15. Electricity: How does the length of a conductive material affect voltage?
15. Tensile Strength: How does water affect the tensile strength of cotton string?
16. Light-to-heat energy: How does black or white paper inside a container exposed to light affect the inside temperature?
17. Liquid properties: How do different liquids affect how many drops a penny will hold?
18. Liquid properties: How will oil affect how many drops of water a dime will hold?
19. Buoyancy: How is buoyancy affected when different substances are dissolved in the water?
20. Chemical reactions: How does temperature affect oxidation rates?
21. Light: How does distance affect the "footprint" of a laser beam?
22. Buoyancy: How does the type of liquid affect buoyancy?
23. Properties of Air: How does temperature affect air currents?

### Idea cluster #2

1. How do anti-fungals affect sprouting success rate? (productivity and efficiency)
2. How do fertilizers affect a plant's growth rate? (productivity/quality)
3. How does temperature affect a plant's growth rate? <sprouting/growth> (plant requirements)
4. How does irradiating affect shelf-life? (product storage)
5. How does the type of soil affect sprouting or growth rate? <many variables> (plant requirements)
6. How does soil compaction affect sprouting success? (tilling for aeration)
7. How does distance between seeds affect plant growth? (productivity/efficiency)
8. How do additives affect shelf-life? (product freshness)
9. How does steaming or boiling affect product color, texture, smell or taste? (product processing)
10. How does soil sterility affect sprouting success or growth rate? (soil preparation)
11. How does the amount of water given to plants affect their growth? (irrigation/soils/climate)
12. How is germination, sprouting or plant growth affected by different colors of light? (plant requirements)
13. How does the amount of light received affect sprouting or plant growth? (plant requirements/season)
14. How does the type of medium affect sprouting time? (soils availability/plant requirements)
15. How does air circulation affect plant growth? (nurseries: growing plants in "closed" settings)
16. How does an "invasive" plant affect the growth of desired plants (weed control)
17. How does the way plants are watered from top/furrows/bottom) affect growth? (productivity/efficiency)
18. How does the way a plant is fertilized (foliar or root) affect growth? (productivity/efficiency)
19. How does the amount of time seed are soaked prior to planting affect their sprouting time? (productivity/efficiency)
20. What amount of nitrogen, phosphorus or potassium (or different ratios of these) produces the best growth? (productivity)

21. What effect does a seed's planting depth have on its sprouting time/success/growth/quality? (productivity)
22. How does distilled vs. well-water (pH) affect plant growth? (productivity/plant quality)
23. How does soil pH affect plant growth? (productivity/quality/efficiency)
24. How does amending a soil with Perlite or ? affect plant growth? (productivity/quality/efficiency)
25. How does a non-permeable container affect root development/mass/size? (production in nurseries)
26. How do 3 different kinds of store-bought fertilizers perform? (consumer education)
27. How do consumers rank a set of products for taste: color, smell, packaging,? (marketing)
28. What packaging "style" of a product will consumers be attracted to most? (marketing)
29. How do consumers relate color of a product to the flavor it might have? (marketing)
30. How will turning a plant onto its opposite side each day affect (a parameter of) a plant's growth?
31. How does the color of light affect the amount of stem between sets of leaves on a plant?
32. How does seed size relate to plant size (from the normal variance found within a given set of seeds)?
33. How is (a plant growth parameter) affected by being watered with milk, starch or sugar added?
34. How do different brands of popcorn vary in their % of kernels that pop?
35. How does light affect the taste of milk?
36. What is the affect of mint on a chosen insect's behavior?
37. How does salt being added to water affect a plant's growth rate?
38. How do brands of a seed type compare with each other in terms of germination %?
39. How does giving a plant no darkness affect its growth?
40. What is the affect of chlorinated water on a plant's growth (or germination success)?
41. How does freezing affect the % of seed germination?
42. How does the way a seed or bulb is planted (direction) affect its sprouting time?
43. How does the type of water affect the growth of plants?
44. How does adding sugar (or ???) to water affect the life of cut flowers?
45. How do different types of food wrapping affect how long an apple will remain un-oxidized?
46. How does temperature affect oxidation (or some freshness parameter)?
47. How does detergent affect plant growth?
48. How do types of soils vary in their ability to hold water?
49. How do earthworms react to different kinds of soils (pH, sand:clay:loam ratios)?
50. How does moving water and still water affect plant or root growth in a hydrponic system?
51. How does the depth a seed is planted affect its ability to sprout?
52. How does oxygen deprivation affect seed germination?
53. How does volcanic ash affect soil quality (plant growth)?
54. How is the germination of different seed types affected by germination inhibitors?
55. How does the surface color of soil affect plant growth?
56. How does the amount light affect the % of, or time of germination, or the characteristics of germinated seeds?
57. How does too much water affect the growth of plants? (related to #11)

### Idea Cluster #3

1. How is the temperature of a liquid affected by the reaction of vinegar and baking soda?
2. How does the color of a plastic filter affect how much light is turned into heat?
3. How is the intensity of sound affected by different materials?
4. How is the boiling point of water affected by the addition of salt?
5. What affect do different metals have on the conductivity of heat?
6. What affect do different materials have on a magnetic field's strength?
7. How does the color of water affect how much light is converted into heat?
8. How is the loss of heat affected by the viscosity of a liquid?
9. How does the color of a surface affect the amount of light that is reflected?
10. How does the color of a surface affect how much light is changed into heat?
11. How does the number of winds in an electromagnet affect the strength of its magnetic field?
12. How does temperature affect a ball's bounce?
13. How do different types of materials affect the transfer of heat?
14. What affect does temperature have on how a ball bounces?
15. How do different colors affect the amount of light being converted into heat?
16. How does the height of a ramp's release point affect how (fast) or (far) an object will travel?
17. How does distance (or heat) affect the strength of a magnetic field of something that's been magnetized?
18. How does a (smoke) affect the temperature in a closed container exposed to heat?

Please feel welcomed to talk to Mr. Morlan or Ms. Koskela about developing inquiry-based questions, 495-2405.