

Sample Inquiry Questions and Resources

Different types of questions suggest different kinds of inquiry.

Experimental Questions

Require observations, but also have a cause and effect relationship; problem-posing, solution-finding, or action-taking questions

- If I change the amount of sunlight, then which plants will grow taller?
- What happens if I give more fertilizer to some plants than others?
- Can I find a way to make my soap box derby car go faster?
- How will the number of magnets affect the speed of the motor?
- How does the height of the ramp affect the distance a ball travels?

NECAP Released Performance Tasks:

(http://education.vermont.gov/new/html/pgm_assessment/necap/resources/released_items.html#science_08)

- Sled Pull (Grade 4): How does increasing the weight of an object affect the amount of force needed to make it move?
- Bird Beaks and Survival (Grade 4): Which beak will pick up the most different kinds of food?
- Pond Weeds (Grade 8): How do weevils affect the growth of EWM in a lake?
- Driver's Education (Grade 11): How does the mass of a moving vehicle affect its stopping distance?
How does the speed of a moving vehicle affect its stopping distance?

NECAP Practice Test:

(http://education.vermont.gov/new/html/pgm_assessment/necap/resources/practice_tests.html#science)

- Playground Trash (Grade 4): Will putting magnets together make a difference in the distance needed to attract objects?
- Rainy Morning (Grade 8): How will the mass of a parked car affect the distance it moves when hit?
How might the slope of the hill affect the distance the parked car moves?
- Acid Lakes (Grade 11): How do the effects of talc on the pH of an acidic lake compare with the effects of lime (calcium carbonate)?

Additional science performance tasks are available at: <http://rlv.education.vermont.gov>

- Username: vt.teacher
- Password: vermont (Password is case sensitive.)
- Click on "Instructional Organizer" tab.
- Click on "Activities."
- Insert "Science" in the search feature to find assessments or go to the bottom of page 34 where they begin.

The Experimental Design

Observational Questions

Involve observing, describing, comparing, measuring, classifying object, organisms, or events

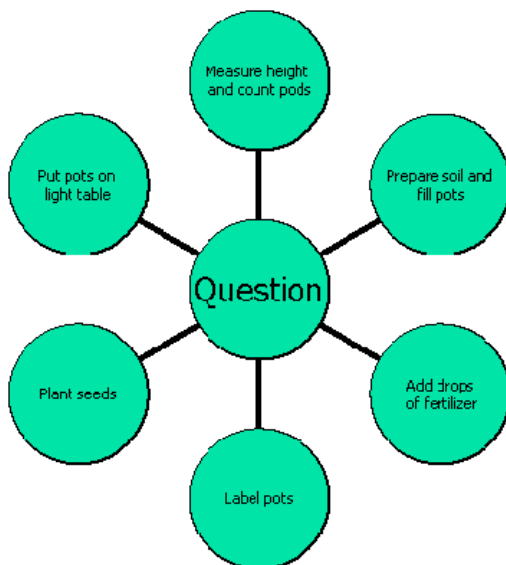
- What do I see, feel, smell when I study these rock samples?
- How are the rabbit and guinea pig the same or different?
- What is the same about the leaves from different trees?
- What plants are in the wetland?
- What are the properties of solids, liquids, and gases?
- What happens to liquids in open containers?
- How does the shape of the moon change over time?
- Where has soil been eroded on the hillside?

NECAP Released Performance Tasks:

- Colliding Plates (Grade 8): What might happen to the sand in the model when the Eurasian and Indian Plates move toward each other?

Creating an Experimental Design

Question: If I change the amount of fertilizer, how will it affect the growth of my plants?



1. Teacher and student work together using graphic organizer (e.g. *Inspiration* software) to brainstorm the steps necessary to answer the question.

2. Review steps and clarify which variable will change and which variables will stay the same.

3. Order the steps in an appropriate sequence to create the Experimental Design.

Data Collection Plan	
Experimental Question:	If I change the amount of fertilizer, how will it affect the growth of my plants?
Procedure: Steps to follow:	<ol style="list-style-type: none"> 1. Mix soil with water and then fill three pots with 250 ml of soil. 2. Plant 3 seeds 5 cm deep in each pot. 3. Place pots equal distance from grow light in the same room at the same temperature. 4. Add 1, 3, 5 drops of fertilizer to three different planting pots every three days. 5. Label the pots. 6. Measure height of plant each day and record the data. 7. Count the number of seed pods.
Variables that remain the same:	<ul style="list-style-type: none"> • Number & type of seeds • Depth of planting • Amount of water • Amount of light • Amount of soil temperature
Variable that changes:	<ul style="list-style-type: none"> • Amount of fertilizer in each planting pot
Things to measure/observe:	<ul style="list-style-type: none"> • Height of plants • Number of pods