

Is Jack's Beanstalk Really That Tall?

Core Content

2.2 Life Science

Regulation and Behavior

The Challenge

Did you ever wonder how large the beans were on the beanstalk that Jack climbed? Wow, perhaps they were as big as watermelons! What regulates the sizes of plants? Is it strictly the genetics of the plants or can external stimuli affect what happens during growth? You will be investigating these kinds of questions.

You were at lunch and overheard two students whose fathers were farmers talking about soybean planting time. They were arguing about how far apart their dads planted the seeds. One, Mary, said his dad planted them 12 inches apart and the other, Joe, said his dad planted them 6 inches apart. Mary said that at 6 inches apart the beans would not get big enough to produce beans. Joe disagreed and said his dad has been growing them that way for years.

Preassessment

Explain why you think the directions on seed packets include instructions on how deep and how far apart seeds need to be planted.

Performance Tasks

Task 1

Obtain bean seeds, two plant flats (approximately 1 ft x 1 ft x 3 in), and potting soil. In one flat plant seeds _ inch deep and 6 inches apart. In the other plant seeds _ inch apart. Record plant heights in a table every 3 days for 2 or 3 weeks after the seeds germinate. What is the question you are asking in this experiment? Based on the data collected, what is the answer to the question (your conclusion)?

Task 2

Design an experiment with plants in which you are going to test how fertilizers regulate plant growth. Pose your question, set up and do the experiment, then draw your conclusions.

Task 3

Obtain packets of seeds (corn, beans, tomatoes). Read the planting instructions on the packet. Design an experiment in which you would verify that the instructions were appropriate.

OER

You saw some data on corn crops from three regions of the country (see Table) and noticed differences in the amount of corn produced. One analyst attributed the differences to rainfall, another to growing season, still another to plant crowding (number of seeds per foot in a row). Analyze the data yourself and draw your own conclusions.

Table

	Number of bushels per acre	Seeds per 10 foot segment of a row	Average yearly rainfall in inches	Average height of plants in feet
Kentucky	100	30	30	7.0
Iowa	200	10	32	9.5
Illinois	120	25	31	7.5