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Exploring Growth Movements in Plants Lab Activity

Aligned with All Published National Standards

ward's science

WARD470190-628

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* The Dimension I practices listed below are called out as **bold** words throughout the activity.

DIMENSION 1 Science and Engineering Practices

×	Asking questions (for science) and defining problems (for engineering)		Use mathematics and computational thinking
×	Developing and using models	×	Constructing explanations (for science) and designing solutions (for engineering)
×	Planning and carrying out investigations	×	Engaging in argument from evidence
×	Analyzing and interpreting data	×	Obtaining, evaluating, and communicating information

DIMENSION 2 Cross Cutting Concepts

	Patterns		Energy and matter: Flows, cycles, and conservation
×	Cause and effect: Mechanism and explanation	×	Structure and function
	Scale, proportion, and quantity	×	Stability and change
×	Systems and system models		

DIMENSION 3 Core Concepts

Discipline	Core Idea Focus
Life Science	LS2: Ecosystems: Interactions, Energy, and Dynamics
	LS4: Biological Evolution: Unity and Diversity

× Indicates standards covered in activity

next generation science standards © 2013

Middle School Standards Covered	High School Standards Covered
MS.LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	HS.LS2-6: Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
MS.LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	HS.LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

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standards and learning objectives

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Content Standards (K-12)			
×	Systems, order, and organization	×	Evolution and equilibrium
×	Evidence, models, and explanation	×	Form and Function
×	Constancy, change, and measurement		

Life Science Standards Middle School		Life Science Standards High School	
×	Diversity and Adaptations of Organisms	×	Matter, Energy, and Organization in Living Systems
×	Structure and Function in Living Systems	×	Behavior of Organisms

× Indicates standards covered in activity

benchmarks for science literacy (AAAS, © 1993)

1. The Nature of Science	1B: Scientific Inquiry
5. The Living Environment	5D: Interdependence of Life
11. Common Themes	11A: Systems
	11B: Models
	11C: Constancy and Change

activity objectives:

- Germinate and grow seedlings in modifiable environments.
- Relate changes in growth direction to evidence of tropisms.
- Evaluate the function of tropism as an advantageous adaptation.

time requirement:

Part A: 15 – 21 days growth

Part B: varied growth time

Part C: varied growth time

Part D: 3 – 5 days growth