

Timeline for Learning Activities in Investigating Cucumbers

Guiding Questions	Condensed Description of Instruction/Student Learning Activities	Week
➤ Which cucumber variety will grow best in the high tunnel? In an Earthbox?	Materials Introduction/Seed Research: Introduce Earthbox, plug trays, heat mats, and 4 varieties of cucumbers. Divide class into 4 groups; assign research on planting requirements and characteristics (vining, bush, parthenocarpic).	Week 1
➤ How will we divide our Earthbox? ➤ Which cells will we plant seeds in in our plug trays? ➤ Will the Earthbox and plug tray plants grow differently? ➤ How can we increase germination rates?	Planting Plan: Use research to create a planting plan for direct seeding (Earthbox) and transplanting from plug trays. Lesson Introduction and Initial Planting: Discuss meaning of germination/factors to increase it (i.e. heat mats variable). Predict which variety will grow best in high tunnel and whether Earthbox and plug tray cucumbers will grow differently. Small groups plant seeds.	End of Week 1
➤ What fraction/percentage of seeds germinate with/without heat?	Recording Data and Determining Fractions/Percentages: Record number of seeds that germinate daily. Graph germination data for all growing conditions	Week 2
➤ Which variety had the highest germination rate? Lowest? ➤ How does heat affect germination?	Germination Data Analysis: Analyze all data to determine impact of heat on germination and find highest and lowest rates.	End of Week 2
➤ How are the plants changing? ➤ What structures have formed? ➤ Do the plants have what they need to continue to grow?	Observations: Observe/ record plant growth data ≥ 2 times per week. Students took pictures and wrote descriptions of observations including new growth and structures. Class discussed observations 1-2 times a week.	Ongoing
➤ What are the structures of a cucumber plant? ➤ What are their functions?	Vocabulary: As the plants form new structures, research names and functions. Add new vocabulary to a list and word wall.	Ongoing
	Vocabulary Assessment 1: Using vocabulary introduced to date, students write detailed explanation of a cucumber's growth process. Students share with parents.	Week 3
➤ What is the average number of true leaves that emerge weekly? ➤ Which variety of cucumber produces the most true leaves?	Data Analysis 2 (True Leaf Progression): Analyze true leaf data over 4 week and graph the progression. Compare true leaf progression among the 4 varieties	Week 4
➤ How can we support plant growth? ➤ What trellis design will best support plant growth?	Trellis Research/Design/Installation: Determine need for trellis to support Earthbox plants and function of tendrils. Design blueprints for trellis; present designs; select which will be used; build/install	Week 5
	Vocabulary Assessment 2: Using vocabulary (from assessment 1 plus new), write detailed explanation of a cucumber's growth process; share with parents.	Week 6
➤ How will each high tunnel garden bed be equally divided?	Planning for Transplanting to High Tunnel/Grid Templates: Develop grid templates for transplanting and use template as a planting guide. Sketch out plan for where to plant each variety.	Week 6
➤ How do you know if a flower is male or female? ➤ What are the parts of a male/female flower?	Male and Female Flowers: Notice presence of different flowers. Research the structural differences between male and female flowers; construct and label diagrams of male and female flowers.	Week 7
➤ How will each garden bed be evenly divided?	Transplanting to High Tunnel: Transplant seedlings from plug trays to the high tunnel beds using grid templates. (Note: Seedlings <i>must</i> have 3-4 true leaves.)	Week 7 or 8
➤ Which variety of cucumber will yield the largest harvest?	Harvesting: Research "size for maturity" to determine when to harvest. Harvest ≥ 2 times/week; measure length, circumference, mass of each cucumber harvested.	Weeks 9-12
➤ What is the mean length, circumference, and mass of each cucumber variety? ➤ Which variety of cucumber grows best in the high tunnel? Earthbox?	Prepare Capstone Presentation: Complete final data analysis. Calculate mean length, circumference, and mass of cucumbers and find the total number of cucumbers harvested; determine answers to the "big" guiding questions. Create power point, video, trifold display presentations to showcase project to parents.	Weeks 13-15
➤ What are the structures and their functions of a cucumber plant? ➤ Which variety of cucumber grew best in the high tunnel? Earthbox?	Present Capstone Project/Structure and Function: Present capstone presentation to parents, peers, and teachers. (Note: Ideally, administer a Vocabulary Assessment 3 the week following capstone presentations.)	Week 16