

Phenomenal corn

Focus question	What is the difference between these corn plants? How can environmental and genetic factors impact corn growth?
Learning target	Students identify the health differences between photos of corn plants and create a possible explanation for these differences.

MS-LS1: From Molecules to Organisms: Structures and Processes

Performance expectation MS-LS1-5	Classroom connection: This activity is an introduction to corn production.
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Science and engineering practices

Constructing Explanations and Designing Solutions	Classroom connection: Students begin to construct explanations for factors that lead to different outcomes of crop growth.
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Disciplinary core ideas

LS1.B: Growth and Development of Organisms	Classroom connection: Students make observations about the impact the environment may have on corn plants.
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Cross-cutting concepts

Cause and Effect	Classroom connection: Students construct cause and effect relationships as they discuss the corn images and determine what factors could lead to this outcome.
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Phenomena

Show the students the different images of corn below. One photo depicts healthy, actively growing corn while the other photo depicts stunted, poorly growing corn from a drought zone.



Teacher preparation

1. Make copies of the student handout.
2. Load the images to a screen for the class to see. Encourage students to share with the class or in pairs as they brainstorm possible scenarios that could produce the two different crops.

Possible observations or questions about the corn plants from your students.

- What types of plants are depicted in each image?
- How is the environment different in each photograph?
- What is the difference between the plants in each image?
- Why is there a different population of plants in each image?
- What factors lead to productive corn growth?
- What factors lead to stunted corn growth?

Student handout

1. What are some differences and similarities between the two images above?

Differences

Similarities

Students may note differences in color of the plants, the soil, the number of plants in the photos, etc.

2. What are some factors that can lead to plant growth as demonstrated above?

Students may suggest amount of water, fertilizer, etc.

3. What are some ways that technology can help to mitigate poor crop growth?

Students may suggest breeding programs for drought, genetic modification, etc.

Rubric for self-assessment

Skill	Yes	No	Unsure
I can identify at least 3 factors that impact the growth of plants.			
I can list and explain cause and effect relationships between environmental factors and the development of the plant.			

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Differentiation

Other ways to connect with students with various needs:

- **Local community:** Request a presentation to the class from a local agronomist or seed company representative to discuss corn production.
- **Students with special needs (language/reading/auditory/visual):** Grow plants in similar environmental conditions to promote discussion as the phenomena. Allow students to pass the plants around to touch and observe. Have the students create a Venn diagram to indicate the different characteristics of each plant and their similarities.
- **Extra support:** Students can research factors that affect plant growth: Environmental Factors Affecting Plant Growth extension.oregonstate.edu/gardening/techniques/environmental-factors-affecting-plant-growth, and corn growth: Kansas State University: agronomy.k-state.edu/extension/crop-production/corn/corn-growth-development/index.html
- **Extensions:** Students may design student research investigations about corn growth and development.

Assessments

Rubric for assessment

Skill	Developing	Satisfactory	Exemplary
Constructing Explanations	Student can identify factors that impact corn development.	Student can identify factors that impact corn development and ways to improve human impact.	Student can identify factors that impact corn development and ways to improve human impact. Student can construct cause and effect relationships between the factors that impact corn development.

Rubric for self-assessment

Skill	Yes	No	Unsure
I can identify at least 3 factors that impact the growth of plants.			
I can list and explain cause and effect relationships between environmental factors and the development of the plant.			