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# KANSAS CORN: World Wide Web

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This lab is made possible with the support and content contributions of the Kansas Corn Commission.



# Kansas Corn: World Wide Web

## Grade Level: 5

### Unit Overview

Based on direct observation and inquiry, students learn the elements of a cornfield ecosystem, model the relationships among organisms through food chains and food webs, showing how matter and energy move through a system. They investigate the human roles in agricultural food webs, and explore STEM careers in agronomy.

- **Lesson 1:** Students observe the whole and parts of an outdoor ecosystem and begin to analyze the relationships among organisms in a corn field.
- **Lesson 2:** Students learn more about the individual organisms in the ecosystem. They use internet resources to gather and record information.
- **Lesson 3:** Builds on their research as they model food chains and food webs in a corn field.
- **Lesson 4:** Caps the unit off with explorations into the roles of agronomists in managing an agricultural food web, with students exploring STEM careers in agronomy.

### Kansas College and Career Ready Standards

#### Science

- **5-LS2-1.** Students who demonstrate understanding can develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- **5-PS3-1.** Students who demonstrate understanding can use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

#### Language Arts

- **RI.5.7.** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- **SL.5.5.** Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

### Learning Objectives

- Students will make observations of an outdoor setting and a corn field (either directly or through media) and generate a list of living and nonliving things in that ecosystem.
- Students will analyze the relationships of the living and nonliving parts in an ecosystem.
- Students will use reliable digital resources to gather and record information on a Kansas organism.
- Students will group and categorize organisms based on their characteristics.
- Students will model the ways matter and energy move through a corn field ecosystem by creating food chains and food webs.

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- Students will identify the roles of producers, herbivores, carnivores, omnivores, scavengers, and decomposers.
- Students will explain the roles of humans in managing a corn ecosystem.
- Students will explore and report on STEM careers in agriculture.

### Materials

- Kansas Corn science journal
- World Wide Web Discussion Questions (pg. S1 and online at [www.kansascornstem.com](http://www.kansascornstem.com))
- Pencils
- Optional: insect nets, magnifying lenses, tape for collecting plant parts in journal
- Pictures or videos of corn field OR access to a corn field (pg. S2 and online at [www.kansascornstem.com](http://www.kansascornstem.com))
- Large index cards
- Colored pencils
- Student tablets or computers
- Binder clips or paper clips
- Roll of yarn
- Kansas Cornfield Organism Cards (Appendix 1 and online at [www.kansascornstem.com](http://www.kansascornstem.com))
- Sun, Air, Water, Minerals cards (Appendix 2 and online at [www.kansascornstem.com](http://www.kansascornstem.com))
- Producer, Consumer, Decomposer worksheet (pg. S3, key: T19 and online at [www.kansascornstem.com](http://www.kansascornstem.com))

### Safety Considerations

Be aware of student allergies to plants or insects when outdoors. In outdoor settings, set clear boundaries for students, and ensure they know the signal to gather back up. Use safe internet practices.

### Lesson 1: The Whole and the Parts

(45 minutes)

#### *Key question*

“What is an ecosystem?”

#### *Learning Objectives*

- Students will make observations of an outdoor setting and a corn field (either directly or through media) and generate a list of living and nonliving things in that ecosystem.
- Students will analyze the relationships of the living and nonliving parts in an ecosystem.

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### Materials

- Student science journals
- World Wide Web Discussion Questions (pg. S1 and online at [www.kansascornstem.com](http://www.kansascornstem.com))
- Pencils
- Setting: Corn field, or access to an outdoor area such as field, woodland or stream area, school grounds, or field trip to natural area

### Procedures for Instruction

1. Introduce subject and assess for prior understanding (starting in the classroom) by leading a discussion with students:
  - “What do outdoor ecosystems in Kansas look like?”
    - (There should be a variety of responses – agricultural fields, playgrounds, yards, parking lots, streams, lakes, pasture, woodlands, parks, etc.)
  - “Using one area as an example, such as a meadow, what are all the parts that exist within that area?”
    - (Plants, animals, water, air, land, rocks, soil, concrete, sunlight, darkness, streetlights, etc.)
  - “How are all the parts within the area related? Do any of them depend on each other?”
    - (Note that insects, worms, and other invertebrates will feed on plants and plant roots, which in turn provide food for many birds and mammals, etc.)
  - “We’re going to take a look at an actual ecosystem.”
2. Lead students to an outdoor area to explore the whole and parts of the ecosystem. They should bring their science journals and pencils.
  - Whole, big-picture impressions
    - Have students write or draw in their journals for ~5 minutes (timed) their first impressions of the place. Suggest this might include such observations as: the sun is hidden behind clouds, the tree has many leaves on it, a robin is sitting on the fence, ants are crawling across the sidewalk.
  - Detailed, specific observations
    - Then, instruct students to observe the area for a specified time (~15 minutes).
    - Instruct them to observe (see, hear, feel, smell) and list in their journals the details that belong in the ecosystem (living and non-living).
  - Encourage any who finish early to look more closely, close their eyes for a couple of minutes to hear, or use a magnifying glass to see what is often hidden.

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3. Return to the class for discussion (either small group or whole class) to reflect on the system they observed with questions. Have students record answers in Kansas Corn Journal or distribute World Wide Web

Discussion Question (answers may vary) such as:

- “What were the parts of the ecosystem you observed?” (make a group list)
- “Is there anything on this list you don’t think belongs to the system? Why or why not?”
- “Is there anything that belongs to this system that isn’t listed?”
- “How are the different parts related to each other?”
- “Were you surprised by what you found?”
- “Do the small parts contribute to the big picture? How?”
- “Could the whole exist without the parts?”
- “What does an ecosystem need to survive?”

Note: Plants combine sunlight, water, and air in the process of photosynthesis to create living matter (the “stuff” that plants are made of). Therefore, these abiotic factors are absolutely necessary!!

- “Does an ecosystem consist of only things we can see?”
- “What is an example of an ecosystem that we can’t see?”
  - (consider micro-organisms in the soil, water, our gut and those of other animals)

4. Start to analyze relationships.

- Instruct students to start with one living part of the ecosystem they listed. On a new page, write and/or draw that organism.
- Then add another organism (write and/or draw) on the same page that is connected in some way (one eats the other; one lives in the other; one relies on the other in some other way).
- Draw a line between them, and on the line, indicate how they are related.
- Add additional organisms and relationships to create a food chain.

5. Conclusion:

- “You have observed many things that belong to the ecosystem, and you have started to analyze the ways they are related.”
- “The big-picture, whole system is what we call the ecosystem. Ecosystems are communities of organisms, and all the living and non-living parts, that belong to those communities.”
- “In our next lesson, we will go more in-depth. Be thinking about all the parts of the whole ecosystem and what roles they play in the system.”
- “I will leave you with two questions: 1) What is one thing that all living things in any ecosystem depend on? And 2) What does an ecosystem look like in a cornfield?” We will discuss those in our next lesson.

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### Assessments

- Formative assessments:
  - What are students' initial ideas of how organisms relate in outdoor areas? Do they recognize the importance of the sun for plant photosynthesis?
  - What do students observe and record in their journals? Do students know that there are many different types of plants (trees, shrubs, herbaceous plants, grasses, flowering and non-flowering plants)? Do they know there are many different types of animals (birds, mammals, reptiles), and that invertebrates such as worms and insects are also animals?
  - Are human beings a part of a natural ecosystem? Do they realize that human-designed areas, such as agricultural fields or playgrounds, also are ecosystems?
  - Initial analysis of organisms: What connections are students making between organisms? Do they know how organisms are related to each other?
- Summative assessments consist of science notebook entries:
  - List of observations
  - Food chain based on observations

### Information for Teachers

- Assess contributions in discussions for prior understanding and adjust instruction if needed.
- Further information and examples of food chains and food webs can be found at: <http://www.sheppardsoftware.com/content/animals/kidscorner/foodchain/foodchain.htm>

## Lesson 2: The Community Players in a Cornfield

(45-60 minutes)

### Key question

“How are the parts of an ecosystem connected?”

### Learning Objectives

- Students will use reliable digital resources to gather and record information on a Kansas organism.
- Students will group and categorize organisms based on their characteristics.

### Materials

- Student science journals
- Pencils
- Kansas Corn Field Organism Cards (Appendix 1 and online at [www.kansascornstem.com](http://www.kansascornstem.com))

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- Large index cards
- Colored pencils
- Student tablets or computers
- Binder clips or paper clips
- Roll of yarn
- Student tablets or computers

### *Procedures for Instruction*

1. Activate prior learning with questions such as:

- “What is an ecosystem?”
- “What does an ecosystem need to survive? Grassland?”
- “How do the parts depend upon each other for survival?”
- “How do the parts relate to the whole ecosystem?”

2. Introduce new ecosystem: an agricultural cornfield. “Today we’re going to think about a specific ecosystem: a cornfield.” Ask students to observe and think about what belongs in a cornfield ecosystem as they watch one or more videos below (also located at [www.kansascornstem.com/education](http://www.kansascornstem.com/education)), OR visit a cornfield to gain direct observations.

- <https://www.youtube.com/watch?v=BmBgE9eBIHY>
- <https://www.youtube.com/watch?v=Miyjun0uD4g>
- <https://www.youtube.com/watch?v=o-gS4gESLHk>

3. Gather ideas about “What We Know”. Ask students to list what we know to the best of our ability. Are there questions they wonder about? Consider the following prompts, and record student responses:

- “What did you observe that belongs to a cornfield?”
- “What are the components that belong to the ecosystem?”  
(e.g., the corn is tall, corn grows in rows, open, thick plant growth, straight rows of corn, shade from trees, noisy creek, windy and dusty, etc.)
- “How is a cornfield ecosystem different than a more natural ecosystem, such as a natural grassland?”
  - (Consider the roles the farmers play in planting the seeds, adding nutrients to the soil, sometimes irrigating to provide water, harvesting the corn so humans and farm animals can eat it, preventing other plants from growing with herbicides, preventing pests from eating the corn with pesticides.)
- “What do all living things in any ecosystem depend on?”
  - (Since photosynthesis is required for all producers, which are at the base of the food chain/web, guide them to recognize the sun and plants as essential for all living things. Photosynthesis also requires water and carbon dioxide, so they might also say these. These are all necessary.)

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### 4. Introduce the research activity:

- Tell students they will be researching one organism of the cornfield ecosystem.
- Have students select an organism, trying to avoid duplications. (If more than one student chooses the same organism, such as a hawk, suggest closely related hawks to give more variety, such as Red-tailed Hawk and a Northern Harrier.)
- Instruct students to use internet resources to learn about their organism:
  - Features – physical appearance, behavior, seasonal differences
  - Location or range in which it lives
  - Habitat it which it lives (water, soil, woodland, open prairie, plowed field, etc.)
  - Food sources
  - How it reproduces and how many offspring
- Have students create an index card with a drawing on one side and the organism's name, and information on the other side.  
(If time does not allow or technology is not available distribute Kansas Corn Field Organism Cards that have the following organisms listed on an index card: corn, invasive weeds, raccoon, hawk, snake, crow, groundhog, deer, field mouse, cricket, corn borer moth, grasshopper, fly, earthworm, sparrow, bacteria. Also distribute the sun, air water and minerals cards.)
- Review safe internet practices.
- Give students 30-45 minutes to conduct research and complete cards.

Appropriate child-friendly websites for research include:

- Plants and Animals: <http://www.kidtopia.info>
- Plants and Animals: <http://easyscienceforkids.com/>
- Diverse species: <http://www.biokids.umich.edu>
- Insects and other pests: <https://pestworldforkids.org/>
- Soil organisms: <https://www.blm.gov/nstc/soil/Kids/index.html>

### 5. Create an ecosystem gallery

- Secure a long string of yarn across a portion or wall of the classroom.
- As students finish, have them clip their card to the yarn using paper clips or binder clips. The cards should have the picture facing out, but be easily turned to read the information on the back.
- Allow students time to read each other's cards. Motivate them by telling them that in our next lesson we will be organizing these into relationships, so they should be familiar with them.



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6. Conclude by sharing research and categorizing organisms:

- Highlight some of the organisms that students researched.  
“Can we put these organisms into categories? What should be grouped with what?”
- Allow students to generate ideas (Silent Writing and/or Think-Pair-Share and/or Small Group).
- Encourage students to think about groupings according to physical similarities (e.g., corn plant, birds, mammals, reptiles, insects, worms; flowering plants, grasses, weeds, soil organisms such as worms, bacteria, fungi).
- “Are there other ways we could categorize these organisms?” Leave students thinking about this question without answering it.

### *Assessments*

- Formative assessments:
  - Assess contributions in discussions for prior understanding and adjust instruction if needed.
  - Assess their research skills while conducting research. Ask and guide them as needed.
  - Assess their understanding of categories of living things in the final discussion. Do they realize insects are animals? Do they realize how many organisms live in the soil (invertebrates like worms, fungi, bacteria, etc.)?
- Summative assessment: Kansas Corn Field Organism Cards

### *Information for Teachers*

- If access to a cornfield is not possible refer to the following links to give students a better understanding of a cornfield. A classroom discussion about what they saw from the video should follow.
  - <https://www.youtube.com/watch?v=BmBgE9eBIHY>
  - <https://www.youtube.com/watch?v=MiyjunOuD4g>
  - <https://www.youtube.com/watch?v=o-gS4gESLHk>
- A whiteboard would also serve as a place to place index cards instead of yarn. If students write information on the back side inverted and attached with scotch tape they could easily flip them over and read research information.
- Alternative Activity: Assign students to play the role of each organism and have them share the information their classmate’s researched about the organism.
- Further information and examples of food chains, food webs, producers, consumers, and decomposers can be found at: <http://www.sheppardsoftware.com/content/animals/kidscorner/foodchain/foodchain.htm>

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### Lesson 3: Networking

(60 minutes)

#### *Key questions*

“How does matter and energy move through an ecosystem?”

“What functions do organisms serve in an ecosystem?”

#### *Learning Objectives*

- Students will model the ways matter and energy move through a corn field ecosystem by creating food chains and food webs.
- Students will identify the roles of producers, herbivores, carnivores, omnivores, scavengers, and decomposers.

#### *Materials*

- Student science journals
- Kansas Cornfield Organism Cards
- Pencils
- Colored pencils
- Binder clips or paper clips
- Roll of yarn
- Student tablets or computers
- Producer, consumer, decomposer worksheet (pg. S3 key: T19 and online at [www.kansascornstem.com](http://www.kansascornstem.com))
- Sun, air, water and mineral cards (Appendix 2 and online at [www.kansascornstem.com](http://www.kansascornstem.com))

#### *Procedures for Instruction*

1. Assess prior learning and engage students:

- “What were the categories of organisms we identified in our ecosystem?”
- “How else could we categorize these organisms? Did anyone have ideas?”
- Encourage the idea that organisms can be categorized by the role they play in the ecosystem.
  - “Can we group all organisms together that create their own food through photosynthesis?” “...that eat plants only?” “...that eat only other animals?”
  - “Where does the energy come from for organisms to live?”

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2. Propose food chains in science notebooks.
  - Instruct students to get out their notebooks, review the organisms they observed in the ecosystem, or refer to Kansas Cornfield Organism Cards
  - Propose new food chains that contain at least 4 organisms. Indicate the relationship with arrows.
  - After 5-10 minutes, have them share their food chains with a partner and compare.
  
3. Discussion to explore food webs with such questions as:
  - “How many of your food chains have common players or organisms?” (e.g., how many have grasshoppers? Birds? Plants?)
  - “Do they play the same role in each food chain?”
  - “Are simple food chains the only way all these organisms relate to each other?”
  - “Let’s see if we can model a corn field ecosystem!”
  
4. Play a game to create a model of an ecosystem food web using organism cards (If you use student cards, make sure there is a balance between organisms: plants, herbivores, omnivores, carnivores, scavengers, decomposers. Also, cards with Sun, Air, Water, Minerals should be included.)
  - Instruct students to retrieve their organism card with the binder clip or paper clip. Each student should have a card with an organism that they make visible to everyone. Or provide each student with Kansas Cornfield Organism Card.
  - You (the teacher) have the cards Sun, Air, Water, and Minerals (or to simplify, just Sun). You also hold the ball of yarn.
  - Arrange everyone in a circle. Tell students that you all are going to create a model of an ecosystem in a corn field, with the yarn showing connections between organisms. Tell them they need to think about what organisms they could connect their own organism to.
  - Going around the circle, everyone announces their organism and a little key information about how it gets its food.
  - You start with the yarn. Clip the end of the yarn to your card(s), then toss the ball of yarn to someone holding a plant card (allowing the yarn to unfurl) and say, “I am the Sun, the Air, the Water, and Minerals. Plants need me to create food.”
  - That person (who represents a corn stalk) catches the ball of yarn. S/he secures the yarn to his/her card, and then tosses the ball of yarn to another person representing an herbivore (such as a grasshopper) that eats it, saying something like, “I am a corn stalk and I get my food from the sun, air, water, and minerals. Grasshoppers eat my leaves for energy.” Each student should indicate how their organism gets its food, and the organism that eat it.

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- Continue around the room until everyone has a piece of the yarn fastened to their card. If there are some leftover organisms that have not joined the web, bring the yarn back to you and start a new layer of the web (while everyone still holds onto the existing one).
5. Connect vocabulary with concepts.
- Students return to desks and open science notebooks.
  - Ask the students if they understand the difference between a food chain and a food web, and make notes on the board or anchor chart. Have students write the definitions in their notebook. (Both are models depicting relationships among organisms and how matter or food moves through an ecosystem.)
    - Food Chain: A model showing linear links of how matter moves in an ecosystem.
    - Food Web: A model showing interdependent and overlapping links of how matter moves in an ecosystem.
    - “Which is more complex? In what ways is it more complex?”
6. Lead into understanding the terms for the roles that organisms play in the ecosystem (see vocabulary list below).
- Ask students to suggest names for the roles that organisms play in the ecosystem. Example: plants can be considered “Food Creators” or “Sunlight Chemists” or “Producers,” since they produce their own food through photosynthesis.
  - “What might you call the organisms that eat plants?” and so on. Using Think-Pair-Share, or Timed Writing, give students 5 minutes to generate names for the different roles in a food chain/web.
  - Guide class discussion, making notes on anchor chart or board.
    - “If plants are called producers, what did you call the organisms that eat them?”
  - Share out different student terms, encouraging them to generate descriptive terms and definitions. Have fun with this. They will likely offer terms scientists use along with others. The goal is to have them construct the definitions of the concepts themselves, with you helping them to refine and restate their understandings.
  - In this fashion, solicit student names for each level in the food web, and end offering (or circling) the term scientists use:
    - Producers: Organisms that produce their own food by photosynthesis (mostly plants)
    - Consumers: Organisms that eat other organisms
    - Herbivores: Organisms that eat plants (grasshoppers, bees, rabbits, deer)
    - Omnivores: Organisms that eat both plants and animals (bears, coyotes, chickens)
    - Carnivores: Organisms that hunt and eat other animals (hawks, snakes, mountain lion, coyote)

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- Scavengers: Organisms that search for and eat dead animals (turkey vulture, crows, flies, cockroaches, raccoons, bears)
  - Decomposers: Organisms that transform dead and decaying organisms or waste into material useable by other organisms such as plants (fungi, bacteria, termites, earthworms)
  - “You are thinking just like scientists, and in fact have come up with many of the same categories they have!”
  - “Can one organism be in more than one category?” (yes) “Can you give an example?”
  - “Which category would be the largest by mass?” (producers, because energy is lost at every level since organisms consume energy to live, grow, and reproduce themselves – they pass on less energy)
  - Another way scientists describe food webs is to indicate:
    - Producer (living things that makes its own food)
    - Primary Consumer (eats producer)
    - Secondary Consumer (eats primary consumer)
    - Tertiary Consumer (eats secondary consumer)
    - Decomposer (organisms that break down dead plants and animals for food)
7. Have students record vocabulary terms and definitions in science notebook
- Create a corn field food web model with labels in science notebook.
  - Instruct students to draw a food web in their science notebook and label each organism using the vocabulary terms.
  - Remind them to include the Sun, Air, and Water as the starting point.
  - Give students 10-20 minutes to complete these.
  - OR use technology such as
    - MindMup: <https://www.mindmup.com/>
    - if students complete the food web correctly they can print a Food Web Certificate of Achievement with their name on it.
    - Scholastic: [http://teacher.scholastic.com/activities/explorer/ecosystems/be\\_an\\_explorer/map/line\\_experiment14.swf](http://teacher.scholastic.com/activities/explorer/ecosystems/be_an_explorer/map/line_experiment14.swf)
8. Conclude with this quote: When we try to pick out anything by itself, we find it hitched to everything else in the universe. –John Muir

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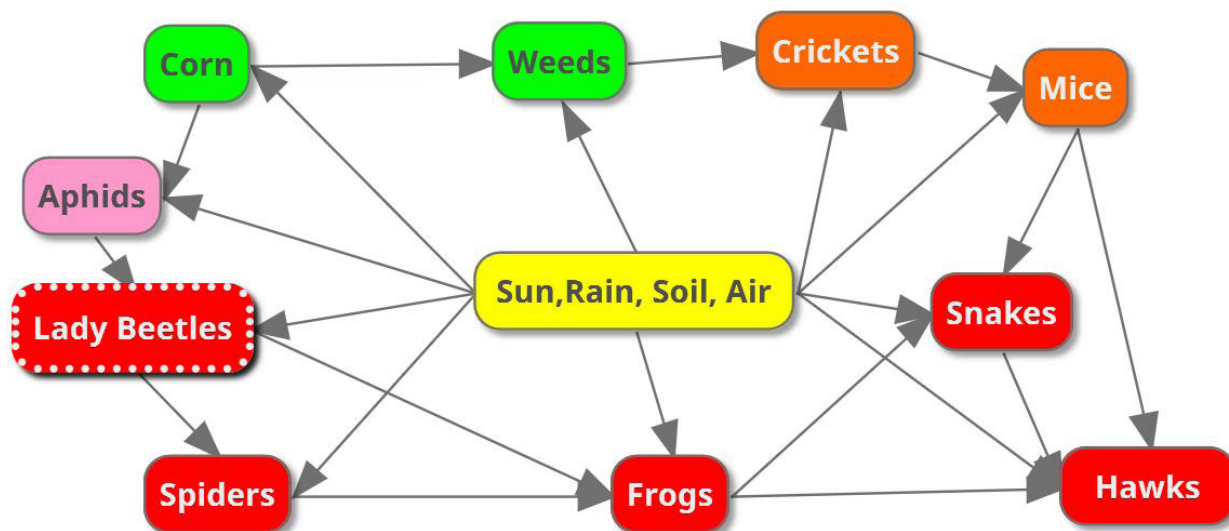
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### Assessments

- Formative assessments during discussion and activities:
  - Assess students' concepts of the roles organisms play in an ecosystem. Do they realize some organisms play multiple roles?
  - Assess students' understanding of the interrelatedness of all organisms in the food web.
  - Assess students' understanding that more producers are needed in a food web than consumers, and more primary consumers than secondary consumers, because energy is used/lost at each level.
- Summative assessments:
  - Food chains and food webs recorded in science notebooks or informal observations using the following websites.
  - Producers, consumers and decomposer worksheet.

### Information for Teachers

- Students can access further information and examples of food chains, food webs, producers, consumers, and decomposers at the following websites:
  - <http://www.sheppardsoftware.com/content/animals/kidscorner/foodchain/foodchain.htm>
  - [http://teacher.scholastic.com/activities/explorer/ecosystems/be\\_an\\_explorer/map/line\\_experiment14.swf](http://teacher.scholastic.com/activities/explorer/ecosystems/be_an_explorer/map/line_experiment14.swf) if students complete the food web correctly they can print a Food Web Certificate of Achievement with their name on it. Below is an example of a web completed correctly.



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### Lesson 4: Agriculture Food Webs and STEM Careers

(1-5 days)

#### Key questions

“How do humans impact food webs in a Kansas corn field?”

“What do careers look like in agricultural S.T.E.M. fields?”

#### Learning Objectives

- Students will explain the roles of humans in managing a corn ecosystem.
- Students will explore and report on STEM careers in agriculture.

#### Materials

- Student science journals
- Pencils
- Student tablets or computers
- Earbuds/Headsets for videos

#### Procedures for Instruction

1. Assess prior learning and engage students in the human role in agricultural food webs with questions such as:
  - “Are humans part of food webs? How so?”
  - “Where do we get our food? How does our food get to the grocery store?”
  - “Are humans producers, herbivores, omnivores, or carnivores?”
  - “How does a corn field food web differ from a natural food web?” Differences would include:
    - With one main producer (corn), less biological diversity throughout the web compared to a natural system (herbivores would only be those that eat corn, etc.)
    - Soil is fertilized and tilled by humans.
    - Plants are planted by humans.
    - Weeds and insect pests are managed by humans.
    - Pollination and breeding is managed by seed producers.
    - Corn is harvested and sold to feed humans and/or animals.
  - “So, are birds helpful or harmful to a corn farmer?”
    - (This would depend on what type of bird and what it eats. A hawk might eat rodents that would eat corn; a flycatcher (bird) might eat insects that would harm the corn; starlings might eat the corn itself.)
  - “Where does the water come from that the corn needs?” (many farmers irrigate fields if necessary)
  - “Where do the minerals come from that the corn needs?” (many farmers fertilize the soil in their fields)

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2. Guide discussion to the many roles agronomists play in managing food webs so that humans and domesticated animals have ample sources of food.
  - “What does someone in an agriculture or S.T.E.M. field do?”
  - Show a video(s) and/or have students view career videos on their own devices / computers:
    - Agronomist Career Video: <https://youtu.be/Aap-6x8Cn3Q>
    - Kansas State University – What is Agronomy? <https://youtu.be/bCTS-BGgusY>
    - Food Scientists and Technologists Career Video: <https://youtu.be/cWbaZEIe7GQ>
  
3. Focus discussion on careers in agriculture or S.T.E.M.
  - Ask students, “Have you thought about what career you might like as an adult?”
  - Have students record in their science journal what job they would like to hold in the future. Key points should include:
    - What kind of task would you have to perform?
    - Is the work to be performed inside or outside?
    - What skills would be important for that type of job?
    - Would you have to go to college and/or trade school?
    - What specialty classes would you have to enroll in to be successful?
    - How much money would you make a month/year?
  - “Why do we need more people who want to work in agriculture?”
  - “Why is agriculture so important in the world today? Tomorrow?”
  - “With a growing world population should we develop new and improved ways of feeding everyone?”
  - “How can the future leaders of the world (you) make a difference as the population of the world is expected to be over 8 billion people by 2030.”
  - “What is sustainability? “How is your generation going to address, hunger, loss of resources, pollution, extinction of species, loss of habitat, over population, housing?”
  - “You can make a difference and the career choice you make might have a positive effect on the lives of millions of people.”
  - Instruct students to research potential careers using the following websites:
    - <http://ionfuture.org/>
    - <https://www.bls.gov/ooh/a-z-index.htm>
    - <https://www.engineergirl.org/33.aspx>
  
4. Allow students to research careers using the websites
  - Instruct students they are to select a career that is agriculture or S.T.E.M. related.
  - Students will take notes in science journal on their career choice.



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- Items they should include in their note taking should include the following:
  - Summary of their career
  - What they do
  - Work environment
  - How to become one/ high school and college course work
  - Pay
  - Job outlook
  - Related careers

### *Assessments*

- Formative assessments during discussion:
  - Assess students' responses to questions about career options and issues their generation will face in the coming years.
- Summative assessment:
  - (Optional) Have students create a 3-5 page PowerPoint or Prezi on their career and present to the class.
  - Have students write/type a report on their career choice including a pathway career web for success in that particular field of study.

### *Information for Teachers*

If you Play as a Guest on the website <http://ionfuture.org/> you will have full access. This website is user friendly.

There are over 40 agriculture and STEM related jobs. Allow students time to explore this website including:

- STEM Is Everywhere
- STEM Career Matchmaker
- View videos

Using the website <https://www.bls.gov/ooh/a-z-index.htm> as a reference only will assist students in gaining further information.

## What's Living in the Cornfield?

### Producers


are plants that make their own food from sunlight, air, water and soil.

### Consumers

are living organisms that don't have the ability to make their own food. All animals are consumers.

### Decomposers

break down dead plants and animals for their food.

 Identify each of following living organisms as either a **producer**, **consumer** or **decomposer**.

1. Hawk: **Consumer**

6. Worm: **Decomposer**

2. Fungi: **Decomposer**

7. Corn plant: **Producer**

3. Raccoon: **Consumer**

8. Weed: **Producer**

4. Deer: **Consumer**

9. Corn beetle: **Consumer**

5. Bacteria: **Decomposer**

10. Mushroom: **Decomposer**

Name: \_\_\_\_\_

## World Wide Web Discussion Questions: Lesson 1

Complete the following questions based on what you observed and recorded in your Kansas Corn science journal. Provide answers with evidence found in the field.

1. What were the parts of the cornfield ecosystem you observed? (make a group list)
2. Is there anything on this list you don't think belongs to the system? Why or why not?
3. Is there anything that belongs to this system that isn't listed?
4. How are the different parts related to each other?
5. How would you compare your detailed observations to your whole first impression?
6. Were you surprised by what you found?
7. Do the small parts contribute to the big picture? How?
8. Could the whole exist without the parts?
9. What does an ecosystem need to survive?
10. Does an ecosystem consist of only things we can see?
11. What is an example of an ecosystem that we can't see? (consider micro-organisms in the soil, water, our gut and those of other animals)



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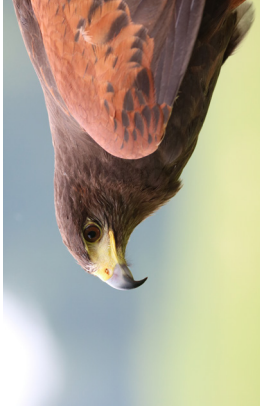
10. Mushroom:



**Corn**



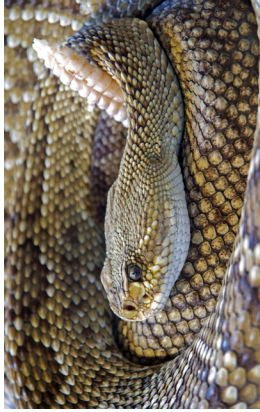
**Raccoon**



**Hawk**



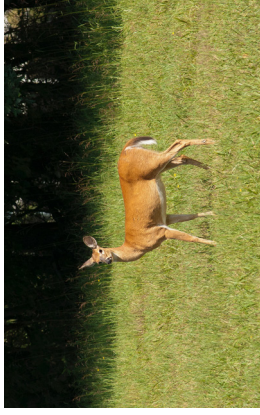
**Weed**



**Snake**



**Groundhog**



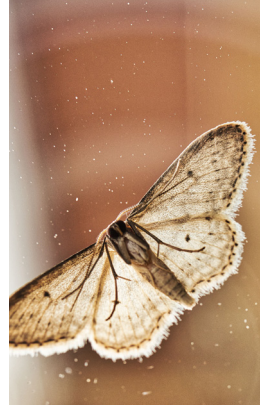
**Deer**



**Field Mouse**



**Cricket**



**Corn Borer Moth**



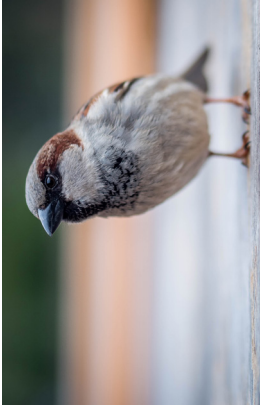
**Grasshopper**





**Bacteria**

KANSAS CORN  
**STEM**



**Sparrow**

KANSAS CORN  
**STEM**



**Fly**

KANSAS CORN  
**STEM**



**Earth Worm**

KANSAS CORN  
**STEM**



**Mineral**

KANSAS CORN  
**STEM**



**Water**

KANSAS CORN  
**STEM**



**Air**

KANSAS CORN  
**STEM**



**Sun**

KANSAS CORN  
**STEM**