

Hoosier Habitat Hike

Ecosystems & Food Webs: Use models to describe that the energy in animals' food was once energy from the sun, support an argument that plants get the materials they need for growth chiefly from air and water, and model the movement of matter among plants, animals, decomposers, and the environment.

Learning target: I can model how energy and matter move through an ecosystem and predict what happens when part of it changes.

Success looks like: Students use the vocabulary correctly, complete the virtual field trip, and score 80% or higher on the evidence-based exit ticket.

Materials: Student devices, the printed lesson worksheet (one per student), projector for the mini-lesson presenter.

LESSON AT A GLANCE

60 minutes

Time	Part	Teacher does	Students do
0:00-0:08	Warm-up	Project the warm-up. Circulate, then call on 2-3 students. Save question 3 for the debrief.	Answer Part 2 of the lesson worksheet; share with a partner.
0:08-0:20	Mini-lesson	Teach with the 4-step presenter. Run each quick check with the whole class.	Complete worksheet Parts 4-11 as each slide appears; answer checks with fingers.
0:20-0:48	Virtual Field Trip	Launch Hoosier Habitat Hike. Assign mission levels; circulate with the answer key.	Play solo or in pairs; record code pieces; complete any written evidence task.
0:48-0:52	Debrief	Ask 2 debrief questions and revisit warm-up question 3.	Finish worksheet Part 13 (prediction check + one thing learned).
0:52-1:00	Exit ticket	Hand out the exit ticket. Collect and sort with the mastery guide.	Answer with evidence independently.

Key vocabulary

Word	Student-friendly definition
Producer	An organism that makes its own food from sunlight (plants, algae).
Consumer	An organism that eats other organisms (herbivore, carnivore, omnivore).
Decomposer	An organism that breaks down dead matter and returns nutrients to soil (fungi, bacteria, worms).
Food web	Many connected food chains in one ecosystem.
Ecosystem	All the living and nonliving things interacting in an area.

1. WARM-UP

0:00–0:08 · 8 min

Warm-up expectations (post these): Answer in Part 2 of the lesson worksheet (or on this sheet). Number each answer to match the question. Answer in complete sentences. For math, show your work. Work silently for 5 minutes, then share with a partner for 2 minutes. Be ready to share one answer with the class.

#	Question	Look for
1	Name two things a plant needs to make its own food.	Any two: sunlight, water, air (carbon dioxide).
2	Write a food chain with three living things from an Indiana forest.	Example: acorn -> squirrel -> hawk.
3	What do you think happens to a leaf after it falls to the ground?	It rots: decomposers like fungi, bacteria, and worms break it down into soil nutrients.

2. MINI-LESSON

0:08–0:20 · 12 min

Project the Lesson presenter from the room page. It runs the whole hour: target and agenda, warm-up with timer, hook vote, 4 teaching steps (key idea, interactive tool, turn and talk, check for understanding), I do / we do / you do, a work-time screen with a timer and expectations, debrief, and the exit ticket. Press N for teacher notes, T to pause the timer, and P to pick a student.

Hook (1 min): In a forest, a hawk eats a snake that ate a mouse that ate seeds. Where did the hawk's energy START? Class vote: The mouse / The seeds / The Sun

Step 1 (3 min): Energy starts with the Sun

Teach	Producers (plants, algae) use sunlight to make food in photosynthesis. Almost all energy in an ecosystem starts with the Sun.
Interactive tool	Visual: chain
Students do	Copy this chain and circle the producer: sunlight -> clover -> rabbit -> fox.
Turn and talk	Where does a hawk's energy really come from? Trace it all the way back.
Worksheet Part 5A	PRODUCERS make their own food from SUNLIGHT. This process is called PHOTOSYNTHESIS.
Check for understanding	Which is a producer? Answer: (A) Oak tree

Step 2 (3 min): Arrows show energy flow

Teach	In a food chain, the arrow points from the food to the eater: grass -> rabbit means energy flows from the grass into the rabbit.
Interactive tool	Board and notes

Students do	Fix this backward chain: hawk -> mouse -> grass.
Turn and talk	Why do you think arrows point toward the eater instead of toward the food?
Worksheet Part 6A	Arrows point in the direction ENERGY flows: from the eaten to the EATER.
Check for understanding	Which food chain is drawn correctly? Answer: (D) Algae -> mayfly -> bass

Step 3 (3 min): Consumers and decomposers

Teach	Herbivores eat plants, carnivores eat animals, omnivores eat both. Decomposers (fungi, bacteria, worms) break down dead things and return nutrients to the soil.
Interactive tool	Flip cards: Deer, Hawk, Raccoon, Mushroom
Students do	Label each flip-card organism herbivore, carnivore, omnivore, or decomposer.
Turn and talk	Is a bear a herbivore, carnivore, or omnivore? What evidence would you need?
Worksheet Part 7A	HERBIVORES eat only plants. DECOMPOSERS return nutrients to the SOIL.
Check for understanding	What would happen without decomposers? Answer: (B) Dead matter would pile up and soil would lose nutrients

Step 4 (3 min): Food webs connect

Teach	Food chains connect into a food web. If one population changes, every population connected to it changes too.
Interactive tool	Simulation: Change one population and watch the web
Students do	Predict what happens to the bluegill when invasive fish arrive. Then watch the simulation.
Turn and talk	If all the frogs in a pond disappeared, name two populations that would change and explain why.
Worksheet Part 8A	In a food web, a change in one POPULATION affects the others connected to it.
Check for understanding	Snakes eat mice. If snakes disappear, what happens to mice first? Answer: (A) Mice increase

I do: worked example (shown one step at a time)

1. Food chain: acorn -> squirrel -> red-tailed hawk.
2. Question: A disease wipes out the squirrels. What happens?
3. Step 1: Hawks lose a food source, so the hawk population may shrink.
4. Step 2: Fewer squirrels eat acorns, so more acorns survive.
5. Step 3: More acorns means more oak seedlings grow. One change ripples through the web.

What to say on every slide is in the presenter script PDF.

We do: guided practice

Food chain: grass -> grasshopper -> frog -> snake. A drought kills much of the grass. Predict what happens to the snakes.

1. Grass is the producer. Less grass means less food for grasshoppers.
2. Fewer grasshoppers survive, so there is less food for frogs.
3. Frogs decrease, so snakes have less food.
4. The snake population will likely decrease too: the change ripples up the chain.

Answer: Snakes decrease

You do: independent check (2 min)

In a forest, owls eat mice and mice eat seeds. A disease kills most owls. What happens to the seeds first?
(A) More seeds, because mice disappear (B) No change (C) Seeds turn into decomposers (D) Fewer seeds, because more mice eat them

Answer: (D) Fewer seeds, because more mice eat them. Students who miss it: 3-minute reteach at the teacher table, then start the room at the Explorer level.

Misconception: "Arrows point to what an animal eats." Arrows show energy flow, pointing toward the eater.

Misconception: "Decomposers are not important." Without them, nutrients would stay locked in dead matter.

Misconception: "Plants get their food from the soil." Plants make food from sunlight, air (carbon dioxide), and water; soil gives nutrients.

3. VIRTUAL FIELD TRIP: HOOSIER HABITAT HIKE

0:20–0:48 · 28 min

Launch: project the start screen, read the story aloud, and assign mission levels (Explorer = extra support, Agent = on level, Legend = challenge). Students can open Supports any time for read-aloud, bigger text, a word bank, and a scratch pad.

- Frame it as a real trip: "Buses leave in 1 minute!" Project the start screen and read the story together.
- Stops go in order along the route. Remind students that each stop's info card is their "tour guide," so they should read it first.
- Ask early finishers to write a postcard (3 sentences) home describing the most interesting stop.

Students turn in: the completion code plus their copied "turn in your work" block (Canvas Text Entry).

4. DEBRIEF

0:48–0:52 · 4 min

1. Why does every food chain start with a producer?
2. Pick one organism from the activity. What would happen to the web if it disappeared?
3. Where does the energy in your lunch originally come from?

Close the loop: return to warm-up question 3. Answer: It rots: decomposers like fungi, bacteria, and worms break it down into soil nutrients.

5. EXIT TICKET

0:52–1:00 · 8 min

Print the exit ticket PDF (page 2 is the key and mastery guide). Every item requires evidence: Part A asks

students to justify each choice, Part B asks for an explanation, and Part C applies the standard to a new situation using Claim-Evidence-Reasoning. Sort results into Mastered, Approaching, and Beginning to plan tomorrow's groups.

LESSON RESOURCES

Resource	How it fits the lesson
Warm-up worksheet (PDF)	Optional standalone warm-up (also Part 2 of the lesson worksheet), with a key.
Mini-lesson presenter	Projectable, step-by-step interactive lesson with tools and quick checks (room page).
Lesson worksheet (PDF + key)	One printable packet students complete during the whole lesson: short fill-ins and quick checks in 13 small parts that match the presenter slides.
Hoosier Habitat Hike (.html)	The virtual field trip for Canvas, with differentiated levels, supports, and a turn-in.
Exit ticket (PDF + key)	Evidence-based check with a rubric and a mastery sorting guide.
Indiana DNR: Fish & Wildlife (extra)	Profiles of Indiana native species for local food web examples. https://www.in.gov/dnr/fish-and-wildlife/
National Geographic Education (extra)	Encyclopedia entries and activities on food webs and ecosystems. https://education.nationalgeographic.org/
PBS LearningMedia (extra)	Search "food web interactive" for free ecosystem games. https://www.pbslearningmedia.org/
Mystery Science: Web of Life (extra)	Video-led lessons on ecosystems and decomposers. https://mysteryscience.com/

ANSWER KEY: HOOSIER HABITAT HIKE

Stop 1: Brown County Forest (code piece: D)

- Sort the forest organisms by their role. -> Producer: Oak tree, Hickory tree | Consumer: Squirrel, Red-tailed hawk, White-tailed deer | Decomposer: Mushroom, Earthworm
- Where does the energy in an acorn originally come from? -> The Sun

Stop 2: Indiana Dunes (code piece: U)

- Build the Dunes food chain in the order energy flows. -> Sun -> Marram grass -> Grasshopper -> Racerunner lizard -> Hognose snake
- In the chain "grass -> grasshopper," what does the arrow mean? -> Energy moves from the grass to the grasshopper

Stop 3: The Wabash River (code piece: N)

- Match each river organism to its type. -> Algae = Producer; Mayfly larva = Herbivore; Great blue heron = Carnivore; Raccoon = Omnivore
- Which organism is the prey in this pair: heron and bass? -> Bass

Stop 4: Prairie Food Web (code piece: E)

- A disease causes the rabbit population to drop. What is most likely to happen to the foxes? -> Their population decreases because they have less food
- If rabbits decrease, what will likely happen to the prairie grass? -> It will increase because fewer animals eat it
- Coyotes eat both rabbits and meadowlarks. If rabbits decrease, what might coyotes do? -> Eat more meadowlarks

4. Tap the animal in this food web that eats BOTH rabbits and meadowlarks. -> Tap Coyote

5. Tap the producer in this food web. -> Tap Prairie grass

Stop 5: Back at the Ranger Station (code piece: S)

1. What would happen to a forest if all decomposers disappeared? -> Dead matter would pile up and soil would lose nutrients

2. Order the steps in the cycle of matter. -> A plant grows using nutrients from the soil -> A deer eats the plant -> The deer dies -> Decomposers break down the deer -> Nutrients return to the soil

Final code: DUNES