

# Food Chains and Food Webs

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## Lesson Overview:

Students will investigate how living organisms depend on one another for energy to survive. Students will learn about food chains and how energy is transferred from one living thing to another living thing. The teacher will use various resources to teach the concepts on food chains, food webs and how energy is transferred. Throughout the lesson the students will complete a Summary Table after each activity and discussion. In addition to the note taking, the teacher will show the video, "Eat or Be Eaten" from Mystery Science website. The students will read about what is a food chain and the levels in a food chain, create a food chain showing levels of consumers, and play a food chain card game with pictures of consumers and producers. Final assessment students will complete a flow chart showing energy being transferred from one living thing to another and write a paragraph describing what a food chain is and the role of a producer, each consumer and decomposer.

## Teacher Background

Living things get their nutrients from food, which is how they get energy to breath, grow and move. A food chain shows how living things depend on other living things. It illustrates the flow of energy from one living thing to another. A food web displays how food chains are inter-connected in an ecosystem.

## Materials Needed

- Technology: computer, smart board, KLEWS graphic organizer
- Inter-active workbook sheets,
- Science Journal
- Glue, scissors, crayons, pencil, paper
- Food chain game cards
- Food chain game score card
- Food chain game 'How to Play'
- Food Chain game rules
- *Wetland Food Chain* book by Bobbie Kalman
- Mystery Science video to support the driving question: <https://mysteryscience.com/ecosystems/ecosystems-the-food-web>
- Summary Table for students to monitor their understanding of the concepts being taught, what they are still wondering about, and to help students organize their thoughts on paper.

- Driving question board to guide class or small group discussions and investigations. (The **driving question** contextualizes the content of a project-based unit and provides students the opportunity to connect it to their personal experiences. A **driving question** is a rich, open-ended **question** that uses everyday language to make connections with students' authentic interests and curiosities.)

## References

Mystery of Science: <https://mysteryscience.com/ecosystems/ecosystems-the-food-web>  
Kalman, Bobbie. Wetland Food Chain. Crabtree Publishing Co. [www.crabtreebooks.com](http://www.crabtreebooks.com)  
5<sup>th</sup> grade Inter-active science workbook [teacher pay teacher](#) (attached to the lesson plan)

**Target Grade/Subject:** 5th grade; Life Science

**Setting:** classroom

**Advance preparation:** pre-cut food chain cards.

## Learning Objectives:

Students will be able to:

- explain what a food chain is,
- describe how energy is transferred,
- create several food chains and show how they can be inter-connected.
- describe how they'd fit into a food chain in a model or in writing.

## Michigan Science Standards

### Matter and Energy in Organisms and Ecosystems

5-PS3-1 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.

5-LS2-1 Develop a model to describe the movement of matter among plants, animals, and the environment.

### SEP: Science & Engineering Practices

Developing and using models, obtaining, evaluating and communicating information

Engaging in argument from evidence

### DCI:

PS3-Energy

LS2: Ecosystems: Interactions, Energy, Dynamics

### CCC: Cross-Cutting Concepts

4. Systems and System Models

5. Energy and Matter: Flows, cycles and conservation

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**Driving Question:** How do living things depend on other living things for food?

#### Engage: Day 1

1. TW pass out the Summary Table graphic organizers (students will use this to record their responses, thoughts and wonders on this sheet after each activity)
2. TW place the driving question on a large board (poster board). SW write their responses on sticky notes that will be posted on the driving question board.
3. TW will use the responses to guide the class discussions. SW add some of the responses to their Summary table.
4. TW read pages 8-11 from the book, **Wetland Food Chains**. TW introduce the vocabulary words, nutrients, producer, consumer, herbivores, omnivores carnivores, primary, secondary and tertiary consumer to the class as he/she reads the book.
5. TW write the definition for each word on the board.
6. SW copy the vocabulary and draw a picture or write an example of each.

#### Explore: Day 2

7. TW review over the driving question board and the sticky notes of questions and ideas.
8. TW show the video, "Eat or be Eaten", from Mystery of Science. TW use the prompts for short discussions.
9. After the video, SW talk about what they learned about food chains and use evidence from the video to support their statement (record their responses on the Summary table).
10. **TW** have the students explain why the hawk chose to live in the city instead of a grassy plain.
11. **TW** use the following questions to facilitate the discussion about what they observed in the video and how it relates to the driving question:
  - What drove the hawks to live in the city?
  - What needs to be present for an animal to live in an area?
  - What evidence can you use from the video to support your statement?

## **Explain: Day 2**

Students will complete another row of their summary table: activity, what they observed, what they figured out and how is it related to the driving question. Students will share out what they learned.

## **Elaborate: Day 3 “Food Chain Game”**

1. TW review over the driving question board, and the students will share what they know about what a living thing needs to survive. **5-minutes**
2. TW have the students review over the vocabulary from day 1. **5 minutes**
3. TW pass out the materials for the food chain game and read over the rules of the game. Students will work in groups of four.
4. Students will create food chains using the game cards and record their models on their game sheet. SW create a food web using the different food chains. **20 minutes**

**(Support and clarifying details:** TW have the students share the different chains they created. **Teacher will have the** students label each consumer in their food chain.)

## **Evaluate: Day 4**

**Informative Evaluation:** Students will cut and paste pre-printed animals and plants onto construction paper. Students will label each part of the food chain correctly: producer, energy, and primary, secondary, tertiary consumer.

**Formative Evaluation:** Students will explain what a food chain is in their own words, create a food chain and model how different food chains connect to make a food web.

Teacher will assess the student’s food chain explanation to make sure that they mention transfer of energy, and that animals eat other animals for nourishment and energy. Students should start each food chain with a producer, and include three consumers.

**Vocabulary:** producer, consumer, primary, secondary, tertiary, food chain, food web (see p. 8-11 in *Wetland Food Chain* book)

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

### Summary Table

What did we do?	What did we observe? What patterns did we notice?	What have we figured out?	How does this relate to the _____?



# EAT OR BE EATEN

a food chain game

## Jumping Spider



I pounce on insects that spend time on the ground. I eat crickets, ants, cockroaches, caterpillars, and even daddy long legs.

I eat...

MYSTERYscience

## Fence Lizard

I eat ants, beetles, crickets, caterpillars, cockroaches, pill bugs, snails, and spiders.



I eat...

MYSTERYscience

## Dead Leaves

I may not look tasty, but I'm just what some animals want for lunch.



I am eaten!

MYSTERYscience

## Mouse

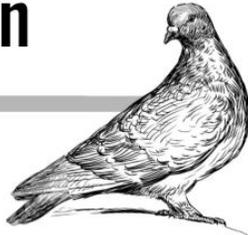


Cartoon mice eat cheese. Real mice like me eat human food—when we can find it. I'll also eat seeds and nuts (like acorns), or snack on vegetables like zucchini or tomatoes. And sometimes I eat crickets and beetles.

I eat...

MYSTERYscience

## Pigeon



You can feed me popcorn, bread crumbs, and peanuts. But when no one gives me human food, I eat seeds and berries—plus snails, earthworms, and crickets.

I eat...

MYSTERYscience

## Web-spinning Spider

I eat flying insects. House flies, butterflies, and even honeybees can get caught in my web. Dinner is served.



I eat...

MYSTERYscience

## Crow



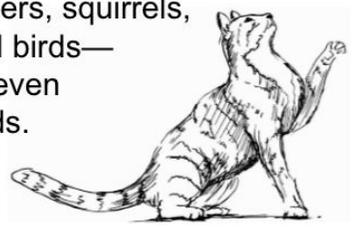
I eat almost anything: acorns, fruits, seeds, and human food. I like beetles, crickets, and cockroaches. I hunt for animals like frogs, moles, mice, and lizards. I'll even steal eggs from the nests of robins, sparrows, and pigeons.

I eat...

MYSTERYscience

# House Cat

Yes, I eat cat food. But I like to hunt, too. I prey on mice, gophers, squirrels, small birds—and even lizards.



I eat...

MYSTERYscience

# Swallowtail Butterfly



I drink nectar from flowers—and I'm not picky about what flowers. I'm happy in a flower garden, vegetable garden, or a clover patch. Even a parsley plant is fine with me.

I eat...

MYSTERYscience

# Sparrow



I eat seeds, grains, grass, and berries. I'll also eat bread crumbs if they're around. And sometimes I'll snack on ants.

I eat...

MYSTERYscience

# Clover

I have leaves, flowers, and small seeds. They're a great snack if you like that sort of thing.



I am eaten!

MYSTERYscience

# Opossum

I eat all kinds of things. I catch frogs, moles, snakes, mice, and salamanders. I snack on beetles, cockroaches, earthworms, crickets, and snails. I'm also happy to eat vegetables, seeds, even human food!



I eat...

MYSTERYscience

# Snail

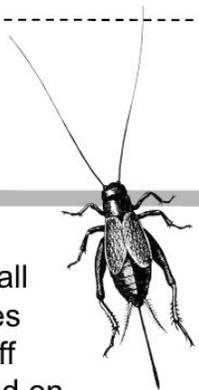


I eat soft green plant leaves—lettuce, parsley, flower leaves, clover, and even grass. Oak leaves are too tough for me, but if I'm hungry I'll nibble on dead leaves.

I eat...

MYSTERYscience

# Cricket

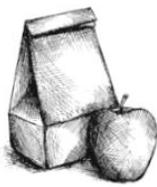


I eat seeds, small fruits, and leaves—either fresh off the plant or dead on the ground. And I'm always hungry! Every day, I eat my own body weight in food.

I eat...

MYSTERYscience

# Lunch Leftovers

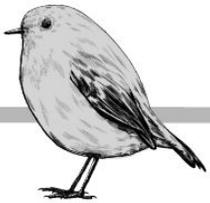


I'm the lunch some kid didn't finish—half a peanut-butter sandwich and an apple with a bite out of it. That's OK—I'm the perfect treat for some hungry animal.

I am eaten!

MYSTERYscience

# Robin

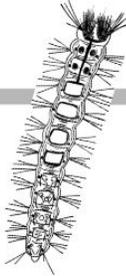


I hop around searching for worms, caterpillars, snails, beetles, crickets, ants, spiders, and even daddy long legs. I'll also eat fruits and berries off bushes and trees.

I eat...

MYSTERYscience

# Caterpillar of a Moth

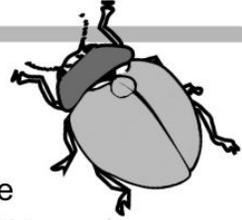


I chow down on rotting wood and dead leaves. That's why you can usually find me hiding under a rotting log.

I eat...

MYSTERYscience

# Beetle



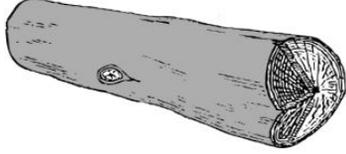
I eat caterpillars. In fact, some people call me the caterpillar hunter. I'll also eat earthworms and snails.

I eat...

MYSTERYscience

# Rotting Log

I'm where hungry animals can find rotting wood, bark, and dead leaves. I'm tasty eating for the right critter!



I am eaten!

MYSTERYscience

# Raccoon

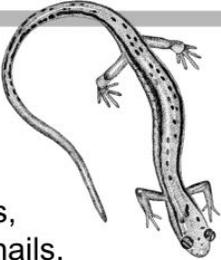


I sometimes raid trash cans for food you threw away. In the wild I eat nuts, fruit, beetles, worms, frogs, salamanders, mice, moles, and snakes.

I eat...

MYSTERYscience

# Salamander



I eat nice crunchy beetles, ants, crickets, along with snails, spiders, ants, and pillbugs. Want to join me for lunch?

I eat...

MYSTERYscience

# Frog



I eat insects with my long sticky tongue—beetles, cockroaches, crickets, houseflies, butterflies, and even bees. I'll also snack on earthworms, snails, and pillbugs. Yum!

I eat...

MYSTERYscience

# Parsley Plant



I'm where animals can find leaves, flowers, and small seeds. In fact, I'm one of the *only* plants that swallowtail caterpillars eat! Bragging rights.

I am eaten!

MYSTERYscience

# Hawk



I swoop down to grab small animals with my sharp claws. I eat gophers, mice, pigeons, robins, sparrows, even lizards and snakes!

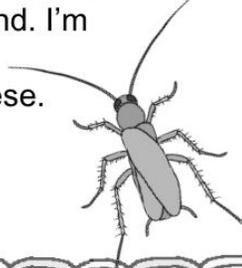
# Daddy Longlegs



I eat insects of all kinds—along with worms, snails, and pill bugs. I'm not a spider, but I eat spiders when I catch them.

# Cockroach

I eat many things, including bark, paper, leaves (living and dead), and any human food I can find. I'm particularly fond of cheese.



# Oak Tree

Some animals are nuts about me. After all, I provide lots of acorns—along with leaves and bark.



I eat...

MYSTERYscience

I eat...

MYSTERYscience

I eat...

MYSTERYscience

I am eaten!

MYSTERYscience

# Mole



I chow down underground (and under logs). I'll eat beetles, earthworms, pill bugs, and crickets. I stay hidden in my tunnel, safe from hawks and housecats!

# Ant



I'm happy to eat human food (like peanut butter), but when that's not around, I'll eat nectar from flowers, seeds from grasses, and any dead insects I find lying around.

# Gopher



I tunnel underground and gnaw the roots of plants—any plants! Sometimes I leave my hole to snack on leaves—keeping an eye out for animals that want to snack on me!

# Flower Garden

Come and get it! I have lots of flowers with sweet nectar, plus lots of leaves and seeds.



I eat...

MYSTERYscience

I eat...

MYSTERYscience

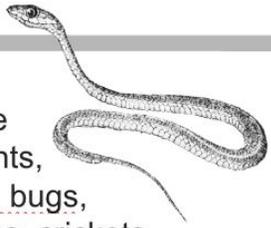
I eat...

MYSTERYscience

I am eaten!

MYSTERYscience

# Garter Snake

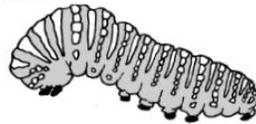


I hunt in the grass for ants, beetles, pill bugs, cockroaches, crickets, earthworms, and spiders. I also eat mice, frogs, salamanders, & lizards. Don't be scared of me...unless you're on my list of snacks.

I eat...

MYSTERYscience

# Swallowtail Caterpillar



Like many caterpillars, I'm a picky eater. I only eat carrot leaves and parsley plants from vegetable gardens.

I eat...

MYSTERYscience

# Gray Squirrel



I eat nuts, like acorns from the oak tree. But that's not all! I eat seeds, fruit, birds' eggs, even lunch leftovers! Peanut butter sandwich? Yes please!

I eat...

MYSTERYscience

# Grass



I have lots of leaves and lots of seeds. That's lunch for lots of critters.

I am eaten!

MYSTERYscience

# Earthworm



I eat bits of plants—like dead leaves or rotting wood. Anywhere that leaves are falling, I can find something for lunch.

I eat...

MYSTERYscience

# Honeybee



I eat pollen and nectar from flowers. I'm happy anywhere flowers bloom—a flower garden, a vegetable garden, a parsley plant, or a patch of clover.

I eat...

MYSTERYscience

# Pill bug



I eat dead leaves, rotting wood, and the fungi that grow on them. Look for me under logs. Poke me, and I roll in a ball—that's why some people call me a roly poly.

I eat...

MYSTERYscience

# Veggie Garden



If you're looking for lettuce, tomatoes, cucumbers, and zucchini squash, I'm the place. Stop by for some leaves and flowers too!

I am eaten!

MYSTERYscience

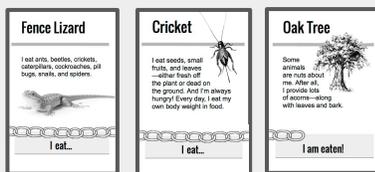
# Rules

## THE GOALS OF THE GAME:

- Make as many food chains as you can.
- Make the chains as long as you can. (Longer chains get bonus points!)

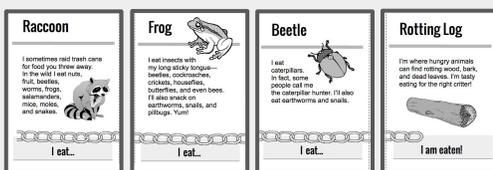
## HOW SCORING WORKS:

You'll get **1 point** for every card in a food chain:



**3 cards = 3 points**

If your chain is 4 cards or longer, you get an extra **2 bonus points**:



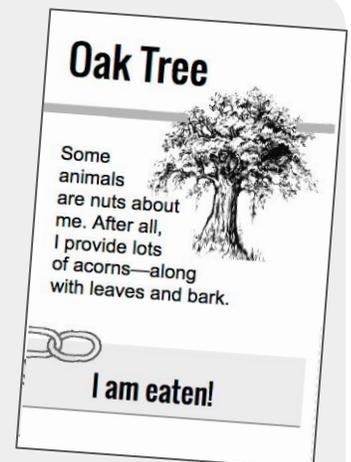
**4 cards  
+ 2 bonus points  
= 6 points**

## HOW STEALING WORKS:

- You CAN'T steal on the first round.
- Starting in the second round, you can choose a card from the center stack **or** you can STEAL a card from another player *if* you can use that stolen card to make a chain right away.
- You CAN'T steal a card that is already in a player's food chain.

## TIP: THINK CAREFULLY

Read the cards carefully. The Cricket card says crickets eat leaves. The Oak Tree has leaves. That means the cricket can eat the oak tree!



## TIP: REARRANGE YOUR CHAINS

You can rearrange your food chains whenever you want. Take them apart and put them together in different ways. Can you figure out ways to get longer chains?

# Rules for Eat or Be Eaten Food Web Game

## You need:

- 2 to 4 players
- A deck of Eat or Be Eaten cards
- A table where player can lay out their cards as they form food chains

**Goal of the Game:** Make as many cards as you can into food chains AND make those food chains as long as you can.

## How to play

1. Shuffle the deck and pile the cards in the center, face down.
2. On the first round, players take turns picking a card from the pile & reading the card aloud.
3. On each subsequent turn, a player has a choice. They can choose a card from the pile or steal a card from another player.

**Important Note:** Once a card is linked in a food chain, it can't be stolen. Putting cards in a food chain protects them.

4. The game continues until all the cards are used or you run out of class time.
5. At the end of the game, each player tallies their score using their *Eat or Be Eaten* scorecard.

## Rules for Scoring

- You get **1 point** for every card in a food chain.
- Food chains of four or more cards get **2 bonus points**.

**Note:** At Mystery Science, we encourage players to reason from the descriptions on the cards. For example, the cricket eats dead leaves and the oak tree produces leaves. Though the oak tree card doesn't say that there are dead leaves under the oak tree, a player may contend that there are leaves under the tree to provide food for the cricket and make a food chain.

## Advanced Play: Making Food Webs

Players may realize that some of their food chains could be connected to form a network of interlocking chains — that is, a food web.

If your group realizes this and if you have time, ask them to see how many chains they can connect in a food web. It is possible to arrange the entire deck of cards so that every card is connected to the others by a predator or prey relationship.

# Score Card

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

## 1. WRITE DOWN YOUR LONGEST CHAIN:

\_\_\_\_\_ eats \_\_\_\_\_ eats \_\_\_\_\_ eats  
\_\_\_\_\_ eats \_\_\_\_\_ eats \_\_\_\_\_. Yum!

## 2. ADD UP YOUR SCORE! Use the back if you run out of room:

**Chain 1:** Write down how many cards are in the chain: \_\_\_\_\_  
If there are 4 or more, add 2 bonus points: \_\_\_\_\_

**Chain 2:** Write down how many cards are in the chain: \_\_\_\_\_  
If there are 4 or more, add 2 bonus points: \_\_\_\_\_

**Chain 3:** Write down how many cards are in the chain: \_\_\_\_\_  
If there are 4 or more, add 2 bonus points: \_\_\_\_\_

**Chain 4:** Write down how many cards are in the chain: \_\_\_\_\_  
If there are 4 or more, add 2 bonus points: \_\_\_\_\_

**Chain 5:** Write down how many cards are in the chain: \_\_\_\_\_  
If there are 4 or more, add 2 bonus points: \_\_\_\_\_

**TOTAL points =** \_\_\_\_\_ points



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