Animal Survival

Grade 3
Life Science

This work was collaboratively developed through the Early Elementary Science Partnership by the program partners at the Big Shoulders Fund, the Chicago Academy of Sciences / Peggy Notebaert Nature Museum, the Field Museum, and Northwestern University.

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Unit Overview

Unit Description

In this unit, students will serve as consultants to the City of Chicago and help them assess their relocation plan for urban coyotes. In order to assess the proposal, students will learn about coyotes' behavioral and physical traits as well as their survival needs. Students will also investigate the three environments featured in the relocation proposal map—woodlands, wetlands, and agricultural areas. They will consider features and resources available in each environment in order to determine which would be best for relocating coyotes. Students will synthesize all information gathered in order to make a final evaluation of the relocation proposal, citing reasons for their assessments. Finally, students will use the original map to create their own recommendation for coyote relocation. They will use evidence to make a claim about why their proposed areas of the map would be best suited to coyote survival.

Driving Phenomena

Coyote populations have been known to occasionally live in urban Chicago areas, which are not always an ideal environment for their survival, as they may not be as resource-rich as a natural environment. The Cook County Coyote Management Plan includes relocation as one of its efforts to keep coyotes out of the city. In order to relocate them effectively, it is important to choose local natural environments where they can thrive.

Driving Question

What local Chicagoland environment would be best for relocating urban coyotes? Why should they be moved there?

NGSS Performance Expectation

This unit builds toward the performance expectation:
3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]

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NGSS Unit Alignment

The performance expectation **3-LS4-3** was developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Engaging in Argument from Evidence Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). • Construct an argument with evidence.	**LS4.C: Adaptation** • For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.	**Cause and Effect** • Cause and effect relationships are routinely identified and used to explain change.

Connections to the three dimensions in this unit:

SEP: Engaging in Argument from Evidence

Students use text, images, museum resources, GIS map data, and dioramas from their focused field trip to collect evidence of the extent to which a local, woodland, wetland, and agricultural area meet coyotes' survival needs. From this evidence, they will make a claim and recommendation about which environment is the best option for relocating urban coyotes for the Cook County Urban Coyote Management Plan.

DCI: LS4.C: Adaptation

Through this unit, students analyze three local environments based on how well they can provide the resources that a coyote needs to survive. Students rate each environment by how well they meet the survival needs of coyotes. Students use this information to decide which environment is best for urban coyote relocation.

CCC: Cause and Effect

By analyzing different local environments to determine the components present within them, students will understand that coyotes can only thrive in areas where all of their survival needs are met. This idea can be expanded upon to more animals in general in further lessons or units.

Additional NGSS elements present in this unit:

SEP: Obtaining, Evaluating, and Communicating Information

- Read and comprehend grade-appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence.
- Obtain and combine information from books and/or other reliable media to explain phenomena.

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Investigation 1: What's the problem with Urban Coyotes?
Lesson 1.1: Coyotes in the City

Lesson Description

35 minutes

Students will learn about the urban coyote sightings in Cook County and discuss the challenges this presents to both coyotes and other living things in the area, including humans. Students will learn about current management efforts in place by Cook County and will be tasked with assessing a proposal to relocate coyotes to another area of Chicago. Students will view a map of Cook County and answer guiding questions to analyze the current proposal for relocation.

Objective

Students will be able to answer guiding questions about a map of Cook County to analyze a proposal for coyote relocation.

Guiding Questions

Why is the presence of coyotes in an urban setting problematic?

How can a map help us understand a relocation proposal?

Materials

Per Class
- Student Resource 1.1 to project
- Coyote in Chicago Video:

}

Per Pair
- Student Resource 1.1

Materials Preparation

- Prepare to project Student Resource 1.1
- Print Student Resource 1.1 for each pair

New Vocabulary

Environment – the surroundings in which a person, animal, or plant lives
Relocate – move to a new area
Thrive – survive very well

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Investigation 1: What's the problem with Urban Coyotes?
Lesson 1.1: Coyotes in the City

Engage — 15 minutes

1. Tell students they will watch a video about an animal that has been seen around Chicago.
2. Play the Coyote in Chicago video to the class.
3. Ask students to discuss the following questions with a partner and then the whole class:
   - Is the city a good place for coyotes to live? Why or why not?
   - What dangers or challenges do you think coyotes might face living in developed areas that they might not face in the wild? (cars, lack of food or shelter, etc).
   - What dangers might coyotes present to humans and other animals in the city?
4. Tell students that the City of Chicago recognizes these challenges too and has created an Urban Coyote Management Plan. One way that they manage urban coyotes is by capturing them and relocating them. However, in order to successfully relocate coyotes, they need to be put into places where they can thrive. The city is looking for a researcher to review their current relocation plan and make recommendations about other areas that would be best-suited

Investigate — 15 minutes

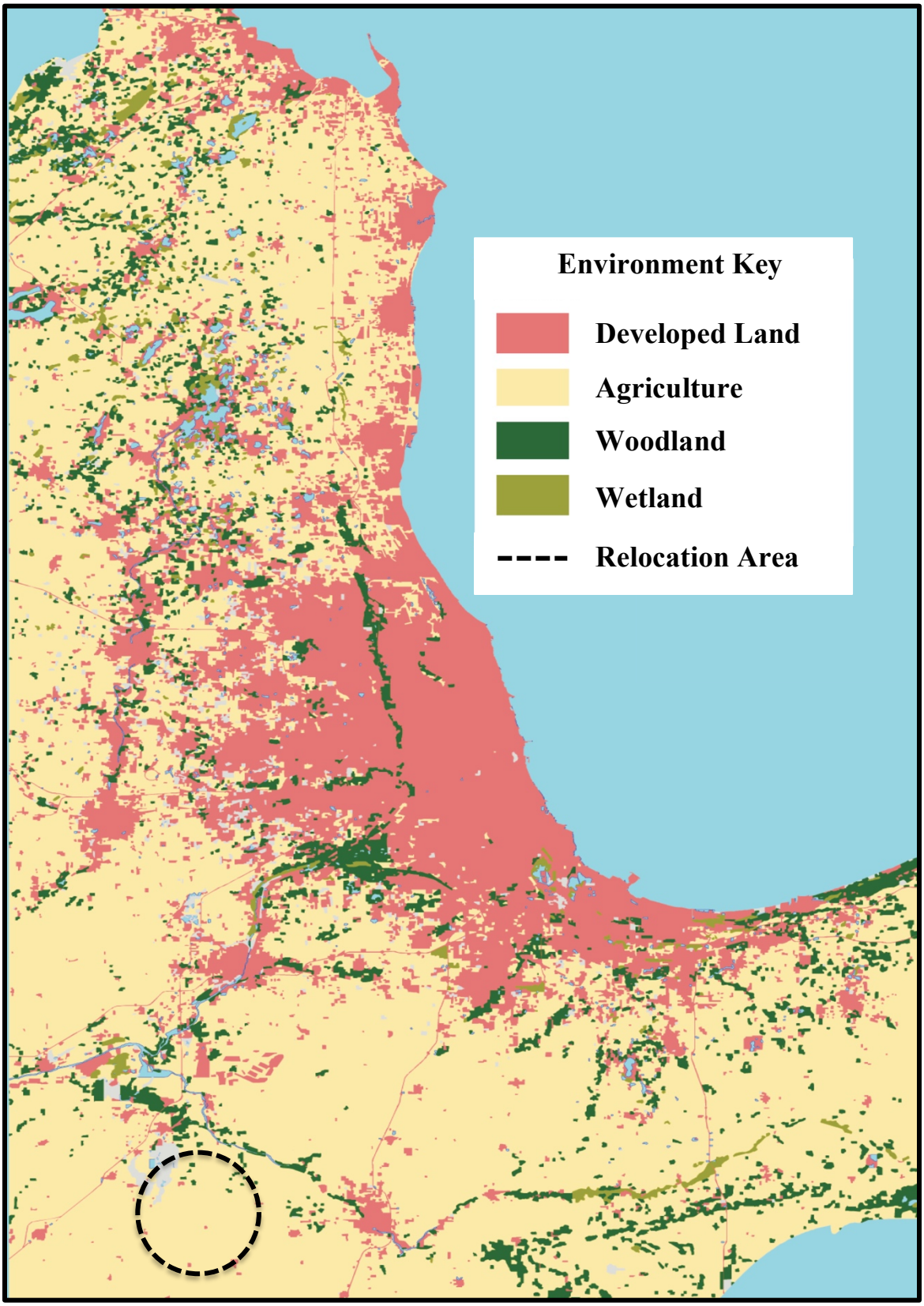
1. Project the map from **Student Resource 1.1** on the board. Tell students that this map shows the city's current proposal for where to relocate urban coyotes. Orient the students to the map by pointing out features such as the title, map key, etc.
2. Break students into pairs and tell them that they will have a chance to look more closely at the city's current relocation proposal.
3. Pass out a copy of **Student Resource 1.1** to each pair of students. Tell students that they will work with their partners to examine the map and answer the questions on the student resource that will help them better understand the proposal for coyote relocation.

Reflect and Share — 5 minutes

1. After pairs have analyzed the map features, ask for volunteers to share their answers to the questions on **Student Resource 1.1.A**. Synthesize student responses to ensure that all students understand what the map shows.
2. Tell students that the City of Chicago needs their help to decide whether they should accept the current proposal for coyote relocation.
3. Ask students what information they think they will need to gather in order to be able to evaluate the proposal (such as coyote survival needs, habitat information, etc.)
4. Tell students that in the coming weeks, they will be investigating all this information in order to make a final decision about whether the current proposal should be accepted or not

Student Resource 1.1.A	City of Chicago Coyote Relocation Proposal

Names: _____



Student Resource 1.1.A Continued

City of Chicago Coyote Relocation Proposal

Analyzing the Coyote Relocation Proposal Map

1. What does each of the colors on the map represent?

2. What does the circle represent?

3. Which environments are included in the circled area?

4. Which environments are NOT included in the circled area?

5. What information would you want to know in order to decide if the circled area is a good suggestion for coyote relocation?

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Investigation 1: What's the problem with Urban Coyotes?
Lesson 1.2: Coyote Survival Needs

Lesson Description

35 minutes

Students will analyze images of coyotes to identify physical traits and make inferences about their needs and behaviors. Students will then read a text in order to gather more information about coyotes.

Objective

Students will be able to analyze text and images of coyotes' physical traits to determine what coyotes need to survive.

Guiding Questions

What do a coyote's physical traits suggest about its needs and behavior?

What does a coyote need to thrive?

Materials

Per Class

- Teacher Resource 1.2 A to project

Per Student

- Student Resource 1.2.A
- Student Resource 1.2.B
- Highlighter

Optional Materials

- Coyote Pelt (See Museum Resources Appendix for additional information)

Materials Preparation

- Prepare Teacher Resource 1.2.A to project
- Print Student Resource 1.2.A and 1.2.B for each student

New Vocabulary

Physical Trait – a quality that typically belongs to a person, place, or thing

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Investigation 1: What's the problem with Urban Coyotes?
Lesson 1.2: Coyote Survival Needs

Engage — 15 minutes

1. Remind students of their task to evaluate the city's proposal for coyote relocation. In order to do so, they will need to know more about what coyotes need to survive.
2. Project the images from **Teacher Resource 1.2.A** on the board.
3. Prompt students to examine the coyote images and write down the physical traits that they notice, as they may provide clues about how coyotes act and what they need to survive.
4. In pairs, have students share the traits they wrote down and discuss their ideas about how those traits might inform how we think the coyote acts and what it needs *(*e.g. *sharp teeth for eating meat; claws for digging, brown fur for camouflaging in natural landscapes)*
5. Have pairs share out their inferences. Use students' ideas to write labels on top of the projected images of the coyote.

Investigate — 15 minutes

1. Tell students that they will read a text about coyotes to learn more.
2. Pair students and distribute one copy of **Student Resource 1.2 B** to each student.
3. Encourage pairs to quietly read the text together.
4. When all pairs have finished reading the text, tell students that they will read it again, but this time they will look for specific information. Assign each pair to look for information about one of the four topics: Food and Water, Shelter and Space, Behaviors, or Dangers and Challenges.
5. Pass out **Student Resource 1.2 C** and tell pairs to use it to take notes about their assigned topics. Remind students to be thorough in their note-taking, because in the next step they will be responsible for sharing the information they gathered with other pairs who did not focus on the same topic.

Reflect and Share — 5 minutes

1. After pairs have gathered information relevant to their assigned topics, regroup students so that new groups have a representative from each of the four topics analyzed in the reading.
2. Direct each topic representative to share the information about their topic with the new group. Encourage other group members use **Student Resource 1.2.C** to take notes.
3. When groups are finished, encourage a few students to share out with the whole class one important coyote survival need, behavior, or threat that they either collected themselves or heard about from another group. Encourage discussion around how each of those facts might help us in considering the relocation proposal.
4. Remind students that they are one step closer in being able to determine whether the area in the relocation proposal is a good suggestion. Tell them that in the next classes, they will investigate some of the environments from the proposal map in order to learn how well they fulfill coyotes' needs and allow them to survive or thrive.

Teacher Resource 1.2.A
Coyote Images

Teacher Resource 1.2.A Continued
Coyote Images

Student Resource 1.2.A
Coyote Text

Directions: Read the following text about coyotes. Then, read it again and highlight text relevant to the theme that you are responsible for.

Coyotes are members of the dog family and share a lot of the same traits with their relatives: wolves, dogs, and foxes. They usually weigh between 20 and 50 pounds, about as much as a medium-sized dog. Coyotes are nocturnal, meaning they sleep during the day and hunt at night. They have very keen senses of sight, smell, and hearing. They can run as fast as 40 miles per hour! Coyotes are good at swimming and digging but are not good at climbing.

They often live alone and protect their territory, up to 4 square miles, from other coyotes. In their territory, coyotes hunt and forage for food and find or make a den. Dens are used for raising pups and sleeping, and coyotes prefer them to be very private. Their ideal den is a hidden hole in the ground or a protected spot under rocks, trees, or bushes. Coyotes can also make dens in urban areas, often in wooded spots or even in abandoned buildings. However, since they have a natural fear of humans, they usually have to relocate if their dens are disturbed by people.

Coyotes are not picky eaters, but they do have preferences for their ideal types of food. In the wild, they hunt for their favorite prey, like rabbits, groundhogs, rats, mice, fish, and the occasional deer. They also forage for plants like berries, small fruits, vegetables, and grass. When those foods are unavailable, coyotes eat other things, like discarded human food, trash from garbage cans, and even cats or small dogs. Coyotes can eat road kill, but they risk getting hit by cars to do so. Of course, coyotes also need water to survive, and they drink from many natural sources like rivers, ponds, and lakes. In urban areas, they must be creative about water sources—they can drink from fountains, swimming pools, and even pets' water dishes left outside!

Group 1: Food and Water
Group 2: Behavior
Group 3: Danger and Challenges
Group 4: Space and Shelter

Student Resource 1.2.B **Note-Taking Guide**

Name: _____

Directions: Take turns sharing the information each pair found out about their topic. Take notes about the most important information for each topic.

Food and Water:

Behavior:

Space and Shelter:

Dangers and Challenges:

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Investigation 2: What Environments are in Chicago?
Lesson 2.1: Wetlands

Lesson Description

35 minutes

Students will analyze images and a video of a wetland environment to identify and describe its characteristics and components. Using this information, students will determine the extent to which a wetland environment meets a coyote's survival needs.

Objective

Students will be able to interpret images of a wetland environment to analyze its components and document the extent to which it could meet the needs of a coyote.

Guiding Questions

What components and characteristics make up a wetland environment?

To what extent do the resources in a wetland environment meet a coyote's survival needs?

Materials

Per Student
- Student Resource 2.1.A

Per Class
- Teacher Resource 2.1.A
- Video "What is a Wetland": **{ HYPERLINK "https://safeshare.tv/x/E_EBcJy335s" }**

Optional Materials
- Animal Habitats: Pond Experience Box (See Museum Resources

Materials Preparation

- Prepare to project, or print Teacher Resource 2.1.A
- Print Student Resource 2.1.A for each student
- Prepare to show wetland video

New Vocabulary

Wetland – a muddy environment with a large body of still water with plants

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Investigation 2: What Environments are in Chicago?
Lesson 2.1: Wetlands

Engage — 10 minutes

1. Ask students to recall what coyotes need in order to thrive and allow a few students to share out with the whole class to review these ideas.
2. Project the original proposal map from **Student Resource 1.1.A** on the board. Tell students that since they know what coyotes need to survive, they can now analyze the environments in Chicago to determine which would be good options for coyote relocation.
3. Tell students that they will begin by investigating wetland environments. Have students identify where they see wetlands on the map.
4. Ask students to think about what a wetland is, and share their ideas with a partner and then with the whole class. Allow students who wish to share out their responses and record them on the board.

Investigate — 15 minutes

1. Distribute a copy of **Student Resource 2.1.A** to each student. Tell students that they will use this graphic organizer to collect information about the features of a wetland that may support or present a challenge to coyote survival.
2. Play video } and encourage students to record information that they think is relevant on their graphic organizer (e.g. access to food, water, shelter, adequate space, or distance to developed areas).
3. Project the wetland image from **Teacher Resource 2.1.A** on the board.
4. Direct students to look at the pictures on the board and work with a partner to identify or infer additional wetland features that may support and challenge coyote survival.

Reflect and Share — 10 minutes

1. Encourage students craft their claim about whether or not a coyote could thrive in a wetland environment. Remind them to make sure to be able to justify their reasoning with specific evidence.
2. Allow each pair to share their claim and reasoning with the class.
3. If students have made different conclusions, encourage them to discuss these differences and cite the evidence that influenced their thinking. Remind students that as long as they can justify their reasoning with evidence, their conclusion is sound.
4. If students change their thinking after hearing others' claims and evidence, they can alter their conclusions on **Student Resource 2.1.A** and reference the new evidence in their justification.
5. Collect the completed student resources for use later in the unit.

Student Resource 2.1.A **Wetland Environment Analysis**

Name(s): _____

Directions: Below, list specific features of a wetland that either support or present a challenge to coyote survival. This may include features such as: sources of food, water, or shelter, ability to camouflage, and distance away from humans, cars, or other dangers.

Features that support coyote survival	Features that present a challenge to coyote survival

Make a Claim

In a wetland environment, a coyote could (circle one)

Thrive **Survive somewhat** **Not survive at all**

Because (explain your reasoning):_____

_____

_____

Teacher Resource 2.1.A
Wetland Environment Image

Photo Credit: DSCF2120 by Uuberfan, 2018

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Investigation 2: What Environments are in Chicago?
Lesson 2.2: Woodlands

Lesson Description

40 minutes

In this lesson, students will utilize images, excerpts, and videos to analyze and describe the extent to which a woodland environment meets a coyote's survival needs.
Note: This lesson can be completed as a field trip (see Museum Resources Appendix for additional information.)

Objective

Students will be able to interpret media showing a woodland environment to document the extent to which the environment meets a coyote's survival needs.

Guiding Questions

What components make up a woodland environment?

To what extent does a woodland environment meet coyote survival needs?

Materials

Per Class
- Teacher Resource 2.2.A
- Student Resource 2.2.A

Per Student
- iPads or Computers
- Student Resource 2.2.B

Materials Preparation

- Prepare to project Teacher Resource 2.2.A
- Print Student Resource 2.2.A and set up the station pages around the room
- Place iPads at stations 2 and 3
- Print Student Resource 2.2.B for each student

New Vocabulary

Woodland – an area of land covered in trees

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Investigation 2: What Environments are in Chicago?
Lesson 2.2: Woodlands

Engage — 10 minutes

1. Project the original proposal map from **Student resource 1.1.A** on the board. Ask students to identify where woodland environments are present in the region.
2. Have students think about what they may already know about a woodland and encourage them to make a quick sketch of what they think a woodland looks like. Prompt students to add labels to describe the features of the environment, including plants and animals.
3. Allow students to share their ideas and drawing with a partner. Project **Teacher Resource 2.2.A** on the board. Have students think-pair-share about how their drawing of a woodland was similar or different to the one projected on the board
4. Encourage students to think about how the features of this environment would support or pose a challenge to coyotes' survival.

Investigate — 20 minutes

1. Pass out **Student Resource 2.2.A.** Explain that students will learn more about a woodland environment through visiting several stations around the room to gather more information. Students should engage at each station and record the evidence they gather on their student resource. Remind them to be specific about what they see that would support or challenge the survival of coyotes (i.e. access to food, water, and shelter, adequate space, distance to developed areas, etc.)
2. Break the class into three groups and direct each group to one of the three stations set up around the room.
3. Allow groups to work at each station for several minutes, before signaling them to move on to the next one.

Reflect and Share — 10 minutes

1. Bring the class back together.
2. Encourage students to use the information they just collected to craft their claim about whether or not a coyote could thrive in a woodland environment. Remind them to make sure to be able to justify their reasoning with specific evidence.
3. Prompt students to share their claim and reasoning with a partner, and then with the class.
4. If students have made different conclusions, encourage them to discuss these differences and cite the evidence that influenced their thinking. Remind students that as long as they can justify their reasoning with evidence, their conclusion is sound.
5. If students change their thinking after hearing others' claims and evidence, they can alter their conclusions on **Student Resource 2.2.A** and reference the new evidence in their justification.
6. Collect the completed student resources for use later in the unit.

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Teacher Resource 2.2.A
Woodland Environment Image

Dustin M. Ramsey, Wikimedia Commons, 9/2001

Student Resource 2.2.A **Woodland Environment Analysis – Station 1**

Name: _____

Nikon D70, 6/2015

Directions:

1. Look closely at the woodland image above.

2. On your Woodland Environment Analysis Sheet, record the features of the woodland that could support coyote survival.

3. On your Woodland Environment Analysis Sheet, record the features of the woodland that could pose a challenge to coyote survival.

Student Resource 2.2.A
Woodland Environment Analysis – Station 2

At this station, you will watch a few videos to learn more about woodlands.

Directions:

1. Watch the following videos about woodlands:
    a. { HYPERLINK "http://www.bbc.co.uk/guides/zc42xnb" }
    b. { HYPERLINK "https://safeshare.tv/x/ss5c4b3c40333dc" }
    c. { HYPERLINK "https://safeshare.tv/x/HYYW_cfu4zA" }

2. Record the features of the woodland that could support or pose a challenge to coyote survival on your Woodland Environment Analysis Sheet.

Student Resource 2.2.A
Woodland Environment Analysis – Station 3

At this station, you will do research on a few websites to learn more about woodlands.

Directions:

1. Explore the following websites about woodlands:
    a. { HYPERLINK "http://www.open.edu/openlearn/nature-environment/woodland-habitats" }
    b. { HYPERLINK "https://bit.ly/2n4smLw" }
    c. { HYPERLINK "https://bit.ly/2LZrSVe" }

2. Record the features of the woodland that could support or pose a challenge to coyote survival on your Woodland Environment Analysis Sheet.

Student Resource 2.2.B **Woodland Environment Analysis**

Name(s): _____

Directions: Below, list specific features of a woodland environment that either support or present a challenge to coyote survival. This may include features such as: sources of food, water, or shelter, ability to camouflage, and distance away from humans, cars, or other dangers.

Features that support coyote survival	Features that present a challenge to coyote survival

Make a Claim

In a woodland environment, a coyote could (circle one)

Thrive **Survive somewhat** **Not survive at all**

Because (explain your reasoning):_____

_____

_____

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Investigation 2: What Environments are in Chicago?
Lesson 2.3: Agriculture

Lesson Description

35 minutes

In this lesson, students will analyze a text to determine the ways in which an agricultural environment may help and hinder coyote survival.

Objective

Students will be able to determine how well a coyote would survive in an agricultural environment by analyzing text about the features of this type of land area.

Guiding Question

To what extent does an agricultural environment meet coyote survival needs?

Materials

Per Class
- Teacher Resource 2.3.A

Per Student
- Student Resource 2.3.A
- Student Resource 2.3.B

Materials Preparation

- Prepare to project or display Teacher Resource 2.3.A
- Print Student Resource 2.2.A and 2.3.B for each student

New Vocabulary

Agriculture – land used for farming crops

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Investigation 2: What Environments are in Chicago?
Lesson 2.3: Agriculture

Engage — 10 minutes

1. Project the initial coyote relocation proposal map from **Student Resource 1.1.A** on the board.
2. Guide students to use the map key to identify where agricultural land can be found in the region, and determine that this is the most prevalent type of land in the relocated area.
3. Project **Teacher Resource 2.3.A** on the board. Direct students to observe the agricultural environment and talk with a partner to discuss how they think this environment may be good or bad for coyotes' survival.
4. Tell students they will learn more about agricultural land to determine how well coyotes might be able to survive in this type of environment.

Investigate — 15 minutes

1. Distribute one copy of **Student Resource 2.3.A** and **Student Resource 2.3.B** to each student.
2. Read the text aloud to the class, or call on students to take turns reading portions aloud.
3. Break students into pairs and direct each pair to read the text one more time. This time, have one person in the pair be responsible for recording all of the aspects of agricultural land that may be beneficial for coyotes, and the other person record all of the challenges that agriculture may present for coyotes. Have each student record the evidence that they glean from the text on their copy of **Student Resource 2.3.B**.
4. Allow students to share the specific information they gleaned from the text with their partner and take notes from their partner.
5. Direct students to craft their final statement about how well coyotes would thrive in an agricultural environment at the bottom of the page. Remind them to make sure to be able to justify their reasoning with evidence.

Reflect and Share — 10 minutes

1. Encourage students to share their claims about how well coyotes would survive in an agricultural environment and explain their reasoning to the class.
2. If students have come to different conclusions, encourage them to discuss these differences and cite the evidence that influenced their thinking. Remind students that as long as they can justify their reasoning with evidence, their conclusions are sound.
3. If students change their thinking after hearing others' claims and evidence, they can alter their conclusions on **Student Resource 2.3.B** and reference the new evidence in their justification.
4. Instruct students write their names on their papers and collect them for future use.

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Teacher Resource 2.3.A
Agricultural Environment Image

https://pixabay.com/en/wisconsin-landscape-scenic-sky-1809870/

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Student Resource 2.3.A
Agricultural Environment Text

Directions: Read the information about agricultural environments below. Record information important to coyote survival on **Student Resource 2.3.B**

Agriculture is another word for farming, or raising crops for food. Agriculture provides what humans need to survive. About 40% of all the land in the United States is used for agriculture.

Crops need water to survive, but many agricultural areas do not have large natural bodies of water nearby. Therefore, agricultural areas often have extensive watering systems in place. Sometimes the water may be provided through a hose or sprinkler system, and in other cases crops may be watered through a series of ditches or canals that send water to each plant.

Pests, like insects, rats, and birds may live in or near agricultural areas because the crops can provide shelter and food. However, farmers often use chemical pesticides to keep their crops from being eaten by these pests. However, the same chemicals that farmers apply to get rid of pests can be poisonous to or harm other species living around the farm. Farmers may also use fertilizers to enrich the soil to help grow more food. Fertilizers can help crops grow, but when it rains, they can runoff into nearby water sources. This can pollute the water source which may affect organisms that drink the water or that live in it.

Because there is so much farmland in the United States, agricultural areas are often make up large swaths of the terrain in a region. Crops may serve as a shelter for animals that live in the area. However, because of the use of heavy farm machinery like tractors, animal homes like nests or dens are often disturbed or destroyed.

Student Resource 2.3.B	Agriculture Environment Analysis

Name(s): _____

Directions: Below, list specific features of an agricultural environment that either support or present a challenge to coyote survival. This may include features such as: sources of food, water, or shelter, ability to camouflage, and distance away from humans, cars, or other dangers.

Features that support coyote survival	Features that present a challenge to coyote survival

Make a Claim

In an agriculture environment, a coyote could (circle one)

Thrive **Survive somewhat** **Not survive at all**

Because (explain your reasoning):_____

_____

_____

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Investigation 2: What Environments are in Chicago?
Lesson 2.4: Environmental Analysis Review

Lesson Description

35 minutes

In this lesson, students will sort images and descriptions to demonstrate their understanding of wetland, woodland, and agriculture environments and analyze and describe the extent to which a coyote can thrive in various environments.

Objective

Students will be able to interpret and sort images of environments into categories while documenting the extent to which each environment meets a coyote's survival needs.

Guiding Questions

What are defining features of woodland, wetland, agriculture, and urban environments?

To what extent do various environments meet a coyote's survival needs?

Materials

Per Group

- Student Resource 2.4.A
- 3 pieces of construction paper
- Glue stick

Per Student

- 3-5 Sticky Notes
- Students' previously completed resources 2.1.A, 2.2.B, 2.3.B

Materials Preparation

- Cut out one set of Student Resource 2.4.A per group

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Investigation 2: What Environments are in Chicago?
Lesson 2.4: Environmental Analysis Review

Engage — 10 minutes

1. Ask students to think about the three environments, wetland, woodland, and agriculture, that they learned about in previous lessons.
2. Tell students to choose one environment, and think about something that reminds them of that environment. Then, on the count of three, tell students to strike a pose that embodies that thing (for example, a student may pose like a duck that reminds them of the wetlands, or raise their arms in a point that reminds them of a barn roof in an agricultural environment).
3. Allow students to tell a partner what they are acting as, and why it reminds them of one of the three environments.

Investigate — 15 minutes

1. Break students into small groups. Distribute one copy of Environment Cards from **Student Resource 2.4.A** to each group.
2. Direct students to sort each picture, label or definition into the three environment categories: wetland, woodland, or agriculture.
3. Once groups have sorted the environment cards, direct them to glue and label the groups onto separate pieces of construction paper.
4. Redistribute students' completed environmental analysis sheets from each of the three environments (**Student Resources 2.1.A, 2.2.B, and 2.3.B**). Encourage students to review the specific elements that they previously determined would support or challenge coyote survival, as well as the claims that they made about each environment.
5. Prompt students to compare this information across environments to make a final claim about which of the three environments is the best place for coyotes to thrive.
6. Direct students to write their final claim on the construction paper that has the cards matching the selected environment

Reflect and Share — 10 minutes

1. Allow each group to briefly share their claim and reasoning about which type of habitat would be best suited for coyote survival with the class.
2. Direct groups to write their names on the construction paper with their claim and collect these pages for future use.

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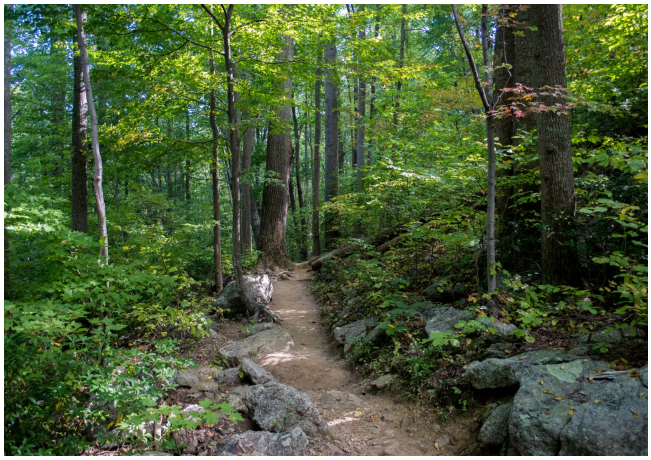
Student Resource 2.4.A
Environment Analysis Cards

Woodland	**Wetland**
Agriculture	Land covered in trees
A muddy environment with a large body of still water containing plants	Land that is used for growing crops
In this environment there is an abundance of plants and animals, such as deer, rabbits, rodents, shrubs, and fruiting plants	In this environment there is an abundance of fish and other aquatic animals and plants
In this environment there are crops such as corn and soybeans as well as small rodents and crop pests	In this environment, there are water sources from hoses and irrigation systems

In this environment, there are water sources from creeks or streams	There is limited dry land in this environment
 Photo Credit: TonyTheTiger, Wikimedia Commons, 2010	 Photo Credit: Patche99z, Wikimedia Commons, 2009
 Photo Credit: Publicdomainpictures, 2018	 Photo Credit: Jennifer Hennessey, USFWS, 2014
 Photo Credit: Greenfoodphotos, 2018	 Photo Credit: Pixcove, 2017

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Investigation 3: Where Should We Relocate Urban Coyotes?
Lesson 3.1: Assessing the Existing Relocation Proposal

Lesson Description

35 minutes

Using their analyses of the three environments, students will evaluate how well the City's current proposal for urban coyote relocation will support coyote survival.

Objective

Students will be able to evaluate how effective a proposed area for coyote relocation is by determining how well the environment meets coyote survival needs.

Guiding Questions

What environments make up the proposed relocation area?

To what extent do the environments in the relocation area meet a coyote's survival needs?

Materials

Per Small Group

- Student Resource 3.1.A

Per Student

- Students' previously completed resources 2.1.A, 2.2.B, 2.3.B

Materials Preparation

- Print out one copy of Student Resource 3.1.A per small group
- Gather students' previously completed resources

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Investigation 3: Where Should We Relocate Urban Coyotes?
Lesson 3.1: Assessing the Existing Relocation Proposal

Engage — 10 minutes

1. Tell students that now that they have gathered all the necessary evidence that they need, they can evaluate the Cook County urban coyote relocation proposal.
2. Revisit the map with the original location proposal (**Teacher Resource 1.1.A**) by projecting or posting it on the board.

Investigate — 15 minutes

1. Break students into small groups of two to three. Distribute one copy of **Student Resource 3.1.A** to each group.
2. Direct students to work together in their groups to identify evidence that they have gathered from the previous investigations to be able to determine how the proposed area may impact coyote survival. Encourage them to refer to the evidence they have gathered in previous lessons, such as **Student Resources 1.2C, 2.1A, 2.2.B, and 2.3.B.**
3. Once students have identified evidence about the area that may impact how well coyotes may survive in the area, have them use this evidence to evaluate the proposal. Encourage students to be thorough in explaining their reasoning about how the area identified will impact coyotes' ability to survive.

Reflect and Share — 10 minutes

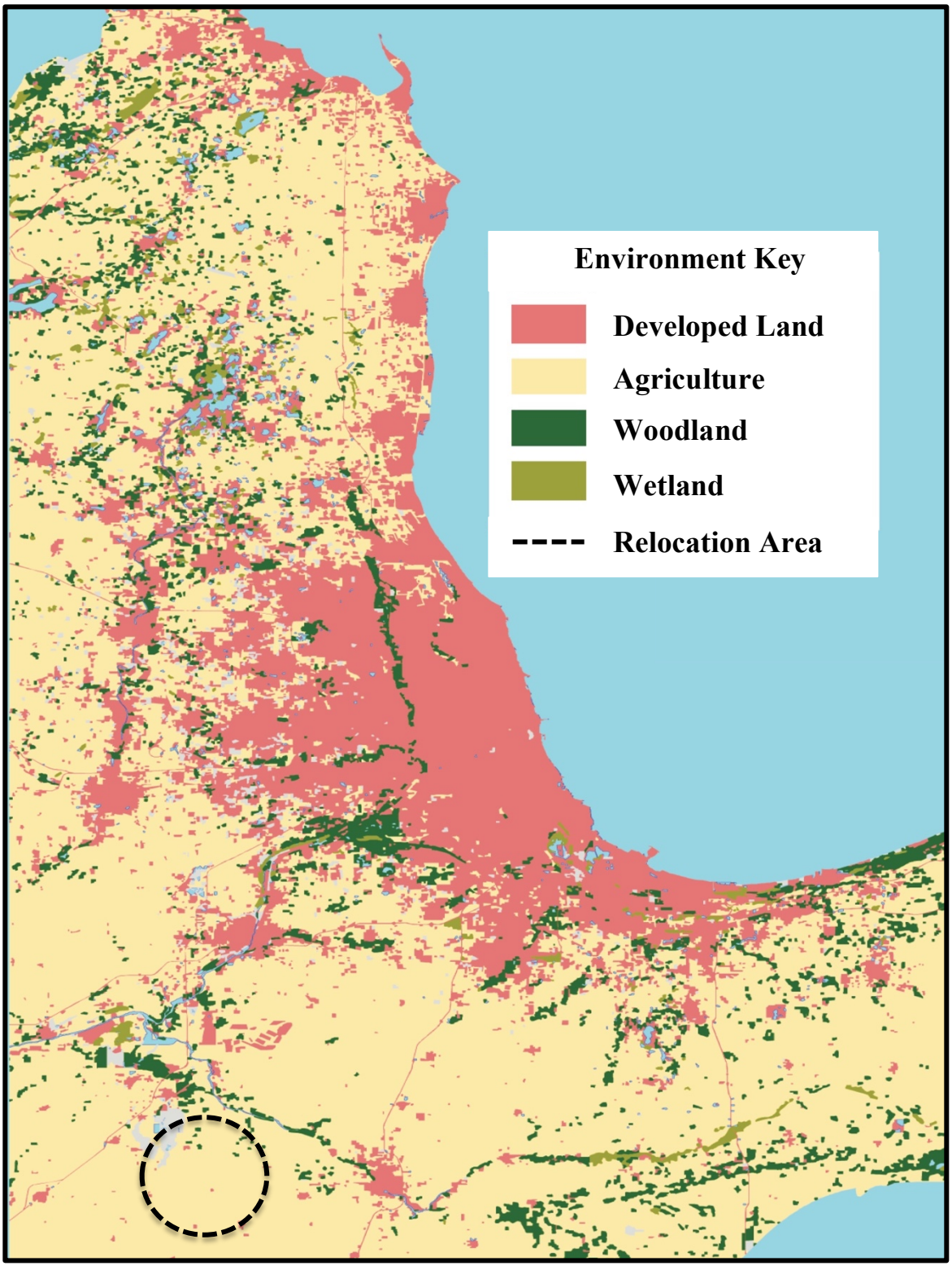
1. After all the groups have evaluated the proposal, allow them to briefly present their findings to the class and explain how they think relocating coyotes to the proposed area would affect the coyotes' survival.
2. Ask students if they are satisfied with the City's current proposal. Tell students that if they think the proposal is not the best for coyote survival, they will have the opportunity to counter this idea with a new proposal that could encompass an area that would be better suited for coyotes to thrive.

   Teacher tip: If students argue that the current proposal is a great recommendation, remind them about the difference between "survive" and "thrive." While it's possible that coyotes might survive in this area, there are other areas that would be more likely to help them thrive.

Student Resource 3.1.A **Evaluating the Coyote Relocation Proposal**

Name(s): _____

The City of Chicago would like a second opinion about their coyote relocation plan. Review the plan and share how well you think it will support coyote survival.



What makes the area a good choice for coyote relocation? (select all that apply)

- The type of environment(s) present in the area
- How far the area is from urban development
- Access to water sources in the area
- The size of the proposed area
- Other:_____

What makes the area a poor choice for coyote relocation? (select all that apply)

- The type of environment(s) present in the area
- How far the area is from urban development
- Access to water sources in the area
- The size of the proposed area
- Other:_____

Overall, how well could coyotes survive in the suggested area? (circle):

very well somewhat well not at all

Explain why you think that:

_____

_____

_____

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Investigation 3: Where Should We Relocate Urban Coyotes?
Lesson 3.2: Creating a New Proposal for Coyote Relocation

Lesson Description

30 minutes

In this lesson, students will synthesize the data that they have collected about each type of local environment and its availability in the Chicago region to create a recommendation for the Cook County urban coyote relocation plan.

Objective

Students will be able to create an effective coyote relocation plan by determining which environments and other elements in a region will allow coyotes to survive well.

Guiding Questions

Where should Chicago's urban coyotes be relocated?

Why should they be relocated there?

Materials

Per Small Group

- Student Resource 3.2.A

Per Student

- Students' previously completed resources 2.1.A, 2.2.B, 2.3.B

Materials Preparation

- Print out one copy of Student Resource 3.2.A per small group
- Gather students' previously completed resources

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Investigation 3: Where Should We Relocate Urban Coyotes?
Lesson 3.2: Creating a New Proposal for Coyote Relocation

Engage — 5 minutes

1. Remind students that in the previous lesson they assessed the efficacy of Cook County's current coyote relocation proposal.
2. Have students think-pair-share with a partner to recall what specifically about the proposal they deemed to be problematic or inadequate.
3. Tell students that they have the opportunity to propose a different relocation destination for urban coyotes by completing a Relocation Recommendation form of their own to submit to county officials.

Investigate — 20 minutes

1. Break students into small groups of two to three. Distribute one copy of **Student Resource 3.2.A** to each group.
2. Direct students to work together in their group to identify an area on the map that they determine to be the best place to move urban coyotes.
3. Encourage students to be thorough in explaining their reasoning for their proposal by drawing on the evidence and student resources that they have gathered throughout the previous investigations.
4. Optional extension: after groups have completed **Student Resource 3.2.A**, allow them to choose a creative way to present this information (i.e. mock PSA, poster, rap, etc.). Their presentations should include their claim supported by their evidence and reasoning.

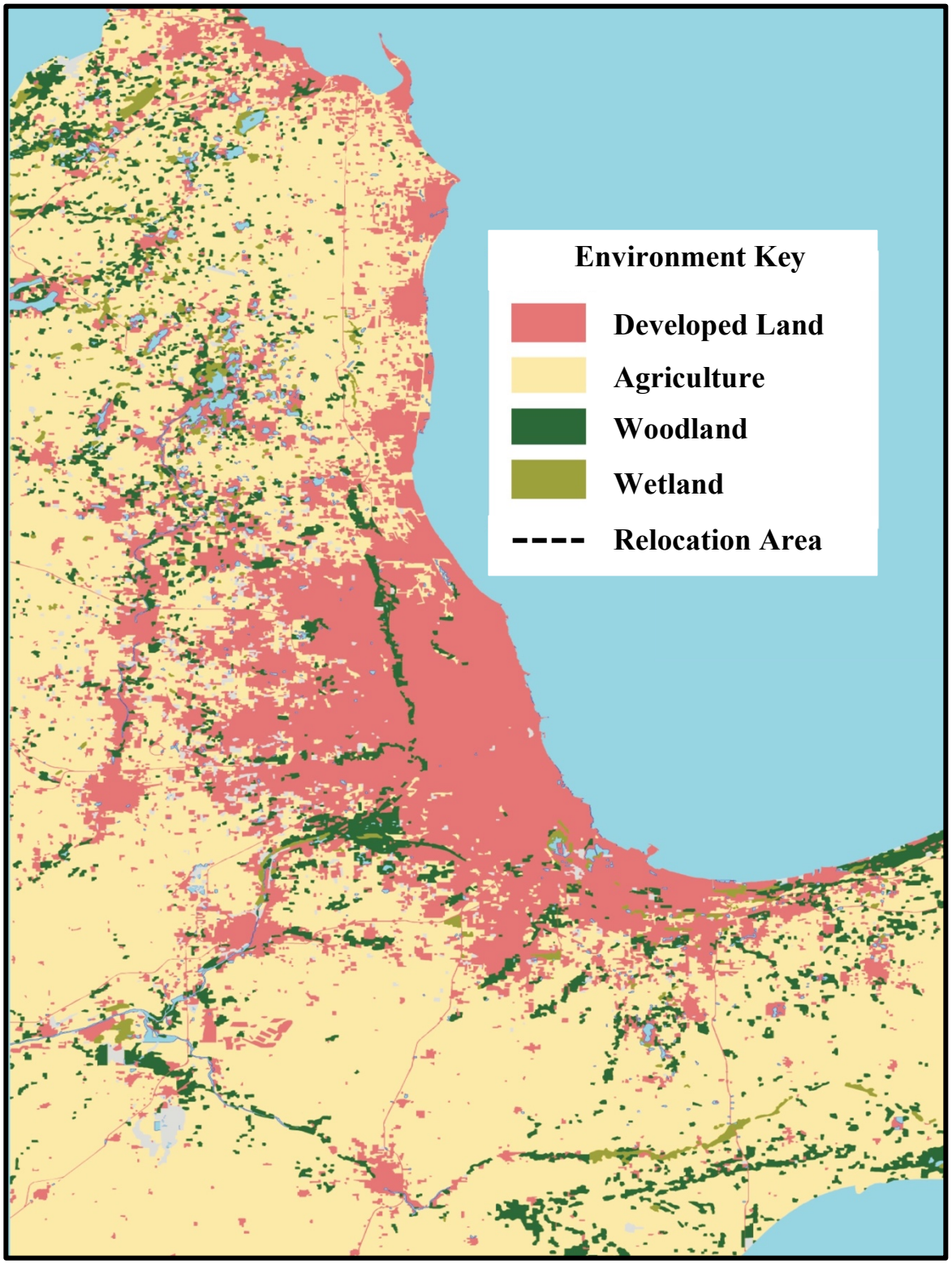
Reflect and Share — 5 minutes

1. Allow each group to present their recommendation letter (or, if extending the lesson, the presentation of their choice) to the other groups with which they are clustered.
2. Encourage students to be good listeners to each of their peers' presentations and to quietly applaud or snap when each group has concluded.

Student Resource 3.2.A	Coyote Relocation Proposal Development
Name(s): _____	

Section 1: Coyote Relocation Recommendation

Draw a dotted line around the area you think is the best place to relocate urban coyotes.



Section 2: Evidence Supporting the Proposed Relocation Area

Explain how each of the factors below impact coyote survival within your proposed area to make it a good place for their relocation.

Types of Environments within the Proposed Area

How would the type of environment(s) present within your proposed area impact coyote survival?

_____

_____

_____

Distance From Urban Development

How would the distance between your proposed relocation area and urban development impact coyote survival?

_____

_____

_____

Continued →

Student Resource 3.2.A Continued
Coyote Relocation Proposal Development

Access to Water Sources

How would access to water sources in your proposed relocation area impact coyote survival?

_____

_____

_____

Size of Proposed Area

How would the size of your proposed relocation area impact coyote survival?

_____

_____

_____

Other Considerations

Are there any other considerations of your proposed relocation area that might impact coyote survival?

_____

_____

_____

Teacher Resource 3.2.A
Coyote Relocation Proposal Rubric

Example Relocation Proposal Rubric

Name: _____ Total: _____ / 7 points

Rubric Elements	Scoring	Additional Information
Identifying a proposed relocation area	☐ Student has drawn a line around a relocation area ☐ Area includes at least one water source ☐ Area includes at least some woodland environment **_____ / 3 points**	
Rational Supporting Relocation Recommendation	Student provides at least one rationale for each consideration: ☐ Type of environment ☐ Distance from urban development ☐ Water sources ☐ Size of area Bonus for additional considerations **_____ / 4 points**	Students can explain the reasoning behind how each of the considerations within their proposed area may impact coyote survival.

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Glossary		

Agriculture – land used for farming crops

Characteristic – a feature or quality that belongs to and can identify a person, place, or thing

Den – a cave or burrow used as a shelter for animals

Developed land – land where humans live

Environment – the surroundings in which a person, animal, or plant lives

Observe – to notice something closely

Physical Trait – a quality that typically belongs to a person, place, or thing

Proposal – recommendation

Relocate – move to a new area

Survive – to continue to live, especially in spite of danger or hardship

Terrain – a stretch of land and its physical features

Territory – an area of land claimed by a particular person, organization, or animal

Thrive – to survive very well

Wetland – a muddy habitat where water covers the land for much or all of the year

Woodland – an area of land covered in trees

Animal Survival **Life Science** **Grade 3**

Connections to Museum Resources

Museum Resource Information

If you are interested in using museum resources in your classroom to support this unit, review the information below and consider bringing in museum objects and/or specimens based on the suggested recommendations.

N. W. Harris Learning Collection **at the Field Museum:** From a skunk specimen to SUE's tooth to a ceremonial mask from Cameroon, the *N. W. Harris Learning Collection at The Field Museum* gives educators and parents a chance to take the Museum's collection to their classroom or home. Visit: harris.fieldmuseum.org

Teacher Leadership Center at the Peggy Notebaert Nature Museum: The Teacher Leadership Center's popular loan program includes the following materials which can be borrowed free of charge for two weeks at a time: Inquiry Kits from the Illinois Department of Natural Resources (IDNR) and the Nature Museum, EnviroScapes, and National Geographic Book Packs. Visit: naturemuseum.org

Suggested Recommendations

Lesson 1.2 Coyote Survival Needs

Item: Coyote Pelt from Prairie IDNR kit at the Peggy Notebaert Nature Museum Teacher Leadership Center

Use: Allow students to touch and observe the coyote pelt in addition to the photographs of coyotes in the Engage portion of the lesson. These observations can be used to more deeply understand a coyote's physical traits that can be used to infer its needs.

Lesson 2.1 Wetlands

Item: Animal Habitats: Pond Experience Box from the Field Museum's *N. W. Harris Learning Collection*

Use: Allow students to investigate the items in the Pond Experience Box to add additional information to their Wetland Habitat Analysis graphic organizer

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Field Trip Extension to replace Lesson 2.2: Woodlands

Lesson Description

55 minutes

In this lesson, students will visit The Field Museum to create a scientific drawing of a woodland environment in order to analyze its elements and determine the extent to which it would support a coyote's survival needs.

Objective

Students will create and analyze a scientific drawing of a woodland habitat to determine the elements that could impact coyote survival.

Guiding Questions

What are the characteristics of a woodland environment?

What characteristics could impact coyote survival?

Materials

Per Student

- Student Field Trip Resource 2.2.A
- Student Field Trip Resource 2.2.B

Materials Preparation

- Print Student Resource 2.3.A for each student
- Print Student Resource 2.3.B for each student

New Vocabulary

Woodland – an area of land covered in trees

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Field Trip Extension to replace Lesson 2.2: Woodlands

Engage — 5 minutes

At school or on the bus

1. Explain that students will make scientific drawings at the Field Museum to learn more about a woodland environment to see how well it supports coyote survival.
2. Pass out pencils and **Student Field Trip Resource 2.2.A**.
3. Remind students that they will use these drawings back at school, so they should take good care of them and write their name on the front.

Investigate — 30 minutes

At the Field Museum

During this focused field trip, you will make two stops - the *Four Seasons* diorama in **Nature Walk**, and another woodland diorama of your choice in the **Messages of the Wilderness** exhibit. These stops can occur in any order and should last about 15 minutes each. At each stop, give students a few minutes of free-exploration time, and then guide them through the process below:

1. Direct students to pick a woodland diorama to study. Encourage students to choose different dioramas.
2. Tell students to closely observe their chosen woodland environment diorama and make a scientific drawing of it, paying special attention to details that may help or pose a challenge to coyote survival. Encourage students to add labels as needed.

Teaching Tip: If any students are unable to attend the field trip, take pictures of relevant dioramas to show to the students after the trip to help them compose their drawing.

Reflect and Share — 5 minutes

Back at school or on the bus

1. In pairs, encourage students to trade scientific drawings. Ask each student to look at their partner's drawing and pick out the environmental elements that they notice.
2. Distribute **Student Field Trip Resource 2.2.B** and direct students to use it to describe how the components may impact the coyote's survival.
3. Encourage students to craft their claim about the environment and share their claim and reasoning with their partner.
4. If students have different claims, encourage them to discuss these differences and cite the evidence that influenced their thinking.
5. Instruct students write their names on their papers and collect them for future use.

Student Field Trip Resource 2.2.A **Woodland Environment Analysis**

Name: _____

Woodland Environment 1:_____

Below, draw the woodland environment. Include pictures and labels of the habitat components that may help or pose a challenge to coyote survival.

Student Field Trip Resource 2.2.A
Woodland Environment Analysis

Woodland Environment 2:_____

Below, draw the woodland environment. Include pictures and labels of the habitat components that may help or pose a challenge to coyote survival.

Student Field Trip Resource 2.2.B **Woodland Environment Analysis**

Name: _____

Directions: Below, list specific features of a woodland environment that either support or present a challenge to coyote survival. This may include features such as: sources of food, water, or shelter, ability to camouflage, and distance away from humans, cars, or other dangers.

Features that support coyote survival	Features that present a challenge to coyote survival

Make a Claim

In a woodland environment, a coyote could (circle one)

Thrive **Survive somewhat** **Not survive at all**

Because (explain your reasoning):_____

_____

_____