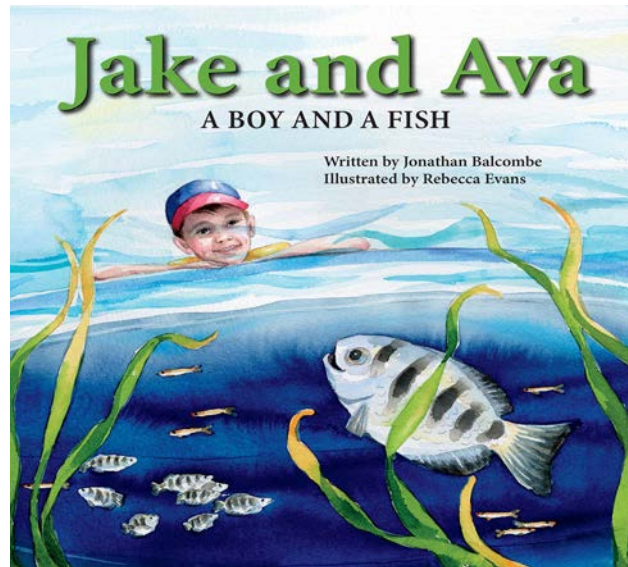


**Classroom Guide – *Jake and Ava: A Boy and A Fish***  
written by Jonathan Balcombe and illustrated by Rebecca Evans



**Guide written by HEART ([Humane Education Advocates Reaching Teachers](http://www.theGryphonPress.com))**  
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**Story Summary:** Jake, a young boy, spends the day fishing with his grandfather while Ava, an archerfish, spends the day learning important survival skills with her uncle. Jake has concerns when his grandfather tells him to pin his worm on the hook because Jake does not want to hurt the worm. His grandfather provides him with a rubber worm instead. Shortly after, Jake catches Ava on his line. Ava feels pain and terror. Jake tells his grandfather that he wants to set her free and his grandfather respects his wishes. Jake's grandfather gently removes the line from Ava's mouth and lets Jake place her back into the river, where she is reunited with her uncle. Ava is filled with joy to be back in the water. Jake tells his grandfather that he no longer wants to go fishing. His grandfather lets him know that he understands and says that what is important to him is simply spending time together.

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**Grades:** 3-4

**Vocabulary - from the book:**

- Aquatic
- Archerfish
- Enveloping
- Expertly
- Glints
- Hoisted
- Mangrove
- Motionless
- Rummages
- Sensation
- Submerged
- Temptingly

**Note:** Scientists use the word “fishes” to refer to more than one species of fish. Even though we usually use “fish” to refer to any number of fishes of the same or different types and will do so throughout this guide, in common parlance, we encourage educators to consider using the word “fishes” to refer to more than one individual fish. Jonathan Balcombe, biologist and author of Jake and Ava: A Boy and A Fish, refers to multiple fish as “fishes” to recognize that each fish is a unique individual.

## **Lesson 1 - Understanding Jake and Ava**

**Grades:** 3-4

**Vocabulary:**

- Interview
- News broadcast

**Objectives:**

Students will be able to...

- develop and answer questions about a story to recount key details and determine the central message.
- describe the thoughts and feelings of characters in a story by examining different points of view.
- apply what they learned about the perspectives of people and fish to their own lives.

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## **USA Common Core State Standards (CCSS)**

CCSS.ELA-LITERACY.RL.3.2: Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.

CCSS.ELA-LITERACY.RL.3.3: Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events.

CCSS.ELA-LITERACY.RL.4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-LITERACY.RL.4.2: Determine a theme of a story, drama, or poem from details in the text; summarize the text.

## **Collaborative for Academic, Social, and Emotional Learning (CASEL)**

CASEL SEL Competencies: Social Awareness, Relationship Skills

## **Humane Education Coalition - Core Components of Humane Education (CCHE)**

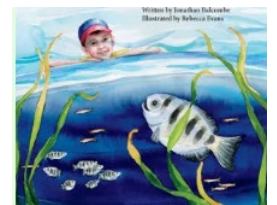
[CCHE](#): 1:B,C,D,E,F,G,H,J; 2:A,C,D; 3:A,B,E,F; 4:B,F; 5:A,B,C

### **Materials Needed:**

- A picture of the cover (without the title) for each small group (or project an image of the cover for all groups to see)
- Quarter sheet of chart paper or poster paper (or reused cardboard, which is a great eco-friendly option) for each group
- Large crayon for each group
- A copy of the book, [Jake and Ava: A Boy and A Fish](#)
- Art supplies for poster making (consider including reused cardboard)
- Paper and writing utensils for each student
- Exit Ticket – 1 per student

## **Lesson Procedure**

### **Opening**



1. Divide students into groups of four and provide each group with a large sheet of paper, a crayon, and a picture of the book cover (with the title removed). Invite students to brainstorm as many questions related to the picture as they can in two minutes. Provide students with the following guidelines:
  - Choose each person to be one of the following: writer, timekeeper, motivator (supports ideas and encourages everyone), and moderator (gives gentle reminders of the guidelines).
  - Everyone contributes to creating the questions.
  - Respect everyone's input; there are no wrong questions.
  - Write everyone's questions down.
  - Do not try to answer the questions.
  - Circle the question your group is most curious about. (Provide this final instruction after the two minutes has elapsed.)
2. Read aloud the book, Jake and Ava: A Boy and A Fish, and pause long enough for students to see the illustrations.
3. Have each group read the question they circled in step 1. Provide students an opportunity to answer the questions based on the reading.

## **Body**

1. Explore the book further with students. Designate a specific space in the classroom for walking around. Let students know that you are going to play music and they can slowly move around and dance while it plays, but whenever the music stops, they are going to freeze. You will ask a question (and you can also project it on a screen, or have it pre-written on the board) and they will discuss it with the person standing closest to them.
  - What activity were Jake and his grandfather doing?
  - What was Uncle Archie trying to teach Ava? Why?
  - Why was Jake hesitant to put the worm on his hook?
  - How did Jake's grandfather react when Jake didn't want to put the worm on his hook? How did he react when he wanted to release Ava back into the water?
  - How do you think Uncle Archie felt when he saw Ava back in the water?
  - What did Ava do when she was back in the water?
  - How did you feel about Jake's decision to put Ava back in the water?

## **Activity**

1. Provide students with the choice to pick one of the following activities to complete independently, in a pair, or in a small group:
  - Make a poster that compares and contrasts the relationship between Jake and his grandfather with the relationship between Ava and her Uncle Archie.
  - Write an extra page for the book Jake and Ava that would follow pg. 9, describing what you think Uncle Archie was thinking, feeling, and doing after Ava was hooked on Jake's fishing line.
  - Create a short news broadcast to cover the story of what happened to Ava when she was caught. One student can role-play the *reporter* (who will ask the interview questions) and other students can role-play *Ava* and *Archie* (who will explain what happened and share how they felt about the situation). Optional: Students can look at the illustrations to include additional characters to interview who observed what happened (e.g., crab, duck, blue heron).
  - Act out a short role-play in which Jake and his grandfather tell his grandmother about their day on the river, sharing the feelings they experienced throughout the day and what they each learned.

**Note:** Students will likely need additional time to complete their work. After they finish their projects, provide an opportunity for them to share their drawings, read their writings, or act out their role-plays.

## Closing

1. Invite students to reflect on what they learned by facilitating a discussion asking the following questions:
  - What is something you want people to know about fish?
  - Pretend that you are at a river, pond, stream, or lake. What do you notice that you might not have thought about before?
2. Ask students to complete an Exit Ticket with the following questions:
  - In one or two sentences, what do you think is the main message of the book, Jake and Ava?
  - In one or two sentences, what did you learn from the book?

## Extension

1. Have students write a personal letter to a character of their choice (Jake, the grandfather, Ava, or Archie). Ask students to consider including the following:
  - Question(s) they want to ask the character
  - A quality or behavior they like about the character

- A quality or behavior they have in common with the character
- A quality or behavior they have that is different from the character
- Advice they want to give the character or something important they want to share with the character

## Lesson 2 – Expressing Ourselves and Listening to Others

**Grades:** 3-4

### **Vocabulary:**

- Hobby
- Recreational

### **Objectives:**

Students will be able to:

- demonstrate active listening skills.
- practice expressing feelings and beliefs through healthy and respectful communication.
- list activities to enjoy nature without causing harm to animals or the environment.

### **USA Common Core State Standards (CCSS)**

CCSS.ELA-LITERACY.RL.3.3: Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events.

CCSS.ELA-LITERACY.RL.4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-LITERACY.RL.4.3: Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text (e.g., a character's thoughts, words, or actions).

### **Collaborative for Academic, Social, and Emotional Learning (CASEL)**

CASEL SEL Competencies: Social Awareness, Relationship Skills, and Responsible Decision-Making.

### **Humane Education Coalition - Core Components of Humane Education (CCHE)**

[CCHE](#): 1:B,C,D,F,J; 2:A,C,D,F,H; 3:A,B,E,F; 4:B,C,F; 5:A,B,C

**Materials Needed:**

- Chart paper or chalkboard/dry erase board
- Paper and drawing supplies
- Bulletin board (or wall space in the classroom or hallway)

**Lesson Procedure****Opening**

1. Ask students to vote (thumbs up/thumbs down) on the following questions:
  - Have you ever had a hard time sharing your feelings?
  - Have you ever been uncomfortable about doing something that someone else wanted you to do?
2. Explain the following, *Jake shared his feelings about not wanting to hurt the worm or Ava with his grandfather, which could be challenging for many people.* Then, have students turn to a person next to them and discuss the following:
  - How did Jake's grandfather help Jake to know it was okay to share his thoughts and feelings?
  - What advice do you have for people who think or feel differently from others about a specific situation or topic?

**Body**

1. Introduce the following role-play activity by providing these instructions: *In pairs, imagine one of you is Ava and the other is a person interested in recreational (hobby) fishing. Have a discussion and try to explain your perspective honestly and calmly to each other.*
2. After the role-play, discuss what participants found helpful or not helpful in the activities and any takeaways they may have for disagreeing in a constructive way.

**Activity**

1. Have students complete a short writing exercise responding to the following:
  - Compare and contrast people who fish for survival and people who fish for a hobby. What are three similarities and three differences?
2. Have students work in pairs to brainstorm a list of outdoor activities that do not cause any harm to animals (e.g., identifying birds and fish, taking nature and wildlife pictures, spotting animals with binoculars, naming how many colors of fish or plants they can see, gently walking in a shallow river or stream).

Challenge the class to see how many activities they can think of (asking each group to contribute to a larger class list).

3. Ask students to illustrate one of these activities and create a bulletin board in your school or classroom showcasing outdoor activities that do not harm animals.

### **Closing**

1. Ask students to reflect on the following and share with either the full class or peers seated nearby:
  - Their favorite way to speak up for what they believe in
  - Their favorite outdoor activity that does not harm animals

### **Extension activity**

- Option 1: Write a short reflection about the reasons some people, like Jake's grandfather, enjoy recreational (hobby) fishing, and the reasons some people, like Jake, prefer not to go recreational fishing. Then, share your personal thoughts and feelings about recreational fishing (e.g., Do you relate more to Jake's grandfather, to Jake, or neither, and why?).
- Option 2: Write a letter to the editor speaking up about ways to support and protect aquatic life.

## **Lesson 3 – A Healthy Habitat for Archerfish**

**Grades:** 3-4

### **Vocabulary:**

- Aquatic
- Diorama
- Ecosystem
- Estuary
- Habitat
- Mutual aid
- Opposable thumbs
- Organism
- Overconsume
- Threats

### **Objectives:**



Students will be able to...

- name at least 3 behavioral traits of archerfish.
- identify where archerfish live geographically.
- define and illustrate the traits of a healthy archerfish habitat/ecosystem.

### **USA Common Core State Standards (CCSS)**

CCSS.ELA-LITERACY.RL.4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-LITERACY.RL.4.2: Determine a theme of a story, drama, or poem from details in the text; summarize the text.

### **Next Generation Science Standards (NGSS)**

NGSS: 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.

### **Collaborative for Academic, Social, and Emotional Learning (CASEL)**

CASEL SEL Competencies: Social Awareness, Relationship Skills

### **Humane Education Coalition - Core Components of Humane Education (CCHE)**

[CCHE](#): 1:B,F,G; 2:A,C,H; 3:A,C,E; 4:B,E; 5:A,B,C

### **Materials Needed:**

- Supplies for making dioramas (shoe boxes, construction paper, repurposed trash and recyclables, glue, and markers or crayons)
- World map or globe
- Internet or library resources for learning about habitats
- Signs posted in the classroom that say “TRUE” and “FALSE” (Optional)
- Pictures of a swamp estuary in Asia or mangrove swamp in Australia (Optional)

### **Lesson Procedure**

#### **Opening**

1. Read the following statements about fish and ask students to move to the left side of the room if they think the statement is true and to the right side if they think it is false. Follow each response with an explanation about which is true and which is false.

- Some fish seek comfort (true)
- Some fish can recognize human faces (true)
- Some fish have fur (false)
- Some fish provide mutual aid to other animals (true)

- Some fish can use tools (true)
- Some fish have opposable thumbs (false)
- Some fish can squirt water up to 10 feet (true)

**Note:** Let students know that archerfish are one of the species of fish who can recognize human faces, use tools, and learn from watching others. As a way to enhance the activity, show images that depict each of the true statements.

2. As explained in the book, archerfish can squirt water up to 10 feet! With a ruler or a tape measure, show the class visually the distance of 10 feet (if your school has 1-foot floor tiles, students can walk the distance of 10 feet by counting floor tiles). Ask students, “What would you squirt with water if you were able to accurately shoot 10 feet away?”

### **Body**

1. Ask students to define “habitat.” If they are unsure, remind them that a habitat is “the natural home or environment of an animal, plant, or other organism.” Ask students to review the images in the book, and guide them in doing research to make a list of what is part of a healthy archerfish habitat. To help guide their research, they can seek to answer these questions:
  - What do fish need to eat for survival?
  - Which animals rely on fish for survival?
2. Once students have an understanding of what a healthy archerfish habitat requires, allow them to locate Australia and Asia on a map or globe. Explain that archerfish can be found in swamp estuaries in Asia and mangrove swamps in Australia. If possible, allow students to see images of swamp estuaries and mangrove swamps by giving them a few minutes to search for images themselves, or by simply projecting the images for the entire class to view.

### **Activity:**

1. Ask students to create a diorama of Ava and Archie’s habitat (either a swamp estuary in Asia or a mangrove swamp in Australia) that illustrates at least 5 features of a healthy archerfish habitat. These features can include plant or animal species or conditions (e.g., clean water, temperatures, tides).
2. Explain that the materials provided for making the dioramas are used items instead of new ones to reduce the demand for taking more resources from the environment (e.g., paper from trees, plastic from oil, fabric from cotton). When we use the same items for something new, it is an example of how we can “reuse.” As students make their dioramas, ask them to reflect on how our choices to over-

consume resources and to litter can affect swamp estuaries, mangrove swamps, and all of the species who live in them.

### **Closing:**

1. Time permitting, allow students to do a gallery walk and observe other students' dioramas. To wrap up, ask students to:
  - review the natural behaviors of archerfish and the types of habitats where archerfish live (orally).
  - identify one action humans can take to help preserve Ava and Archie's habitat (orally or in a journal entry).
  - express how they feel about protecting habitats for aquatic animals (orally or in a journal entry).

### **Extension:**

- Option 1: Write a letter from Ava to people about why it is important to protect waterways.
- Option 2: Research real-life threats to archerfish habitats and create a poster to hang at school educating others about the issue.
- Option 3: Research the ecosystem of the waterways in your local area.
  - What types of animals live in and around the area?
  - What do they need for survival?
  - How do species depend on each other in this ecosystem?
  - Are there any threats to the waterways in our area?
  - How does protecting waterways impact both people and animals?
  - Do you think the local waterways in our community are healthy? (Include evidence to support your answer.)
  - How do you feel about the health of the local waterways in our community and the impact that will have on the aquatic animals who live there?

## **Lesson 4 – Ava's Five Freedoms**

**Grades:** 3-4

### **Vocabulary:**

- Captivity
- Domesticated
- Freedom
- Mistreated

## **Objectives**

Students will be able to:

- discuss a topic respectfully by taking turns and listening to one another.
- list and describe the Five Freedoms (which are known as essential animal welfare standards).
- compare and contrast the life of an animal in the wild versus in captivity.
- express how they feel about animals living in the wild and in captivity.
- observe an animal's living conditions to determine if their Five Freedoms are being met.
- identify ways that people can improve an animal's living conditions and treatment to ensure that the animal is happy, healthy, and comfortable.

## **USA Common Core State Standards (CCSS)**

CCSS.ELA-LITERACY.SL.3.1.B: Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).

CCSS.ELA-LITERACY.SL.3.1.C: Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.

CCSS.ELA-LITERACY.SL.3.1.D: Explain their own ideas and understanding in light of the discussion.

## **Collaborative for Academic, Social, and Emotional Learning (CASEL)**

CASEL SEL Competencies: Social Awareness, Relationship Skills, Responsible Decision-Making

## **Humane Education Coalition - Core Components of Humane Education (CCHE)**

[CCHE](#): 1:B,D,F,J; 2:A,C,F; 3:A,E; 4:B,E; 5:A,B,C

## **Materials Needed:**

- Five Freedoms handout - 1 copy per student (provided below, following the lesson plan)
- Map or globe (optional)
- Poster board – 1 per group (optional)
- Craft supplies (optional)

## **Lesson Procedure**

## Opening

1. Ask students to respond to the following questions:
  - What do people need to be happy and healthy (e.g., food, water, shelter, love, medical care, exercise, companionship)? Write their responses on chart paper, a classroom chalkboard, or a whiteboard.
  - What does a fish need to be happy and healthy? (Circle all the items on the list that a fish has in common with a person.)
  - Are wild fish able to get themselves everything they need to be happy and healthy?
  - In what ways might fish need help from people? (e.g., include removing a hook from the mouth of a fish; if a fish is caught in fishing line, helping to untangle him/her; letting people know that fish have feelings; cleaning up polluted waterways; removing plastic from polluted waterways; provide for their needs if they are in captivity.)

## Body

1. Explain that a group of experts made a list of five things every animal needs to be happy and healthy. These five things are called the Five Freedoms, and they are used as a guide for animal care all over the world.
2. Provide each student with a copy of the Five Freedoms handout and review it with them. Either read it aloud or ask student volunteers take turns reading it aloud. Then, discuss each freedom with the class to make sure they understand what each freedom means.

## Activity

1. Ask students to turn to the person on their left to discuss whether or not Ava's Five Freedoms were met when she was in the mangrove swamp. Then, ask students to turn and talk to a partner on their right to discuss whether or not Ava's Five Freedoms were met when she was hooked onto Jake's fishing line. Provide time for student volunteers to share with the whole class what they discussed. (**Note:** Be prepared to discuss some of the nuances related to whether or not fish are able to experience all Five Freedoms while they are in the wild. For example, they may not have medical care, but they do not depend on people to provide them with their freedoms; instead, they live freely in their own habitat.)
2. Discuss the following points and questions with students:

- There are animals known as wildlife who are able to survive on their own, and they play an important role in the ecosystem. (If needed, define an ecosystem as a community of interacting living beings and their environment.)
  - Can you name some wild animals (e.g., deer, tigers, turtles, bumblebees, sharks)?
  - There are other animals who are domesticated, and they depend on people to survive. Can you name some domesticated animals (e.g., dogs, cats, guinea pigs, chickens)?
  - There are other animals who are commonly kept as pets or companions by people, but they are not necessarily domesticated (e.g., fish, birds, reptiles). These animals are sometimes taken from the wild to be sold as pets or sometimes bred in captivity and sold for money. (**Note:** For additional information about concerns related to the pet fish trade, visit [One Green Planet](#).)
3. Let students know they are going to learn more about archerfish (the same species of fish that Ava and Archie are). Divide students into five groups and assign each group to a different freedom. Ask students to research the following:
- the freedom they were assigned (what their freedom is and why it is important).
  - the needs of an archerfish as related to their freedom and how those needs are met in the wild and in captivity (e.g., if their freedom is freedom from hunger or thirst, research the diet of an archerfish in the wild and in captivity).
  - If a person had an archerfish companion as a pet, how could that person best provide for the freedom of the archerfish?

**Note:** To enhance the activity, ask students to create a poster or slideshow to include with their presentation.

4. Each group will present its freedom to the rest of the class and compare and contrast the way an archerfish might experience that freedom in captivity versus in the wild. Before the first group presents, ask students to identify ways to be respectful, active listeners when others are speaking.

## Closing

1. After all the groups have presented, ask students the following questions:
- Where do you think an archerfish would prefer to live, in the wild or in captivity, and why?
  - If an archerfish is taken from the wild, who and what might be affected by that archerfish being taken away?

- How do you feel about a fish living in captivity? How do you feel about a fish living in the wild?
  - If a fish is living in captivity, what can people do to make sure they are happy, healthy, and comfortable? If a fish is living in the wild, what can people do to make sure they are happy, healthy, and comfortable?
2. Explain that a lot of research needs to go into bringing an animal companion (pet) into our lives. Before bringing an animal into our family, we want to ask ourselves:
    - Where did the animal come from?
    - What does this animal need to be happy, physically and mentally healthy, and comfortable in his/her environment?
    - Can this animal provide for his/her needs in a natural habitat?
    - Am I able to provide for this animal's Five Freedoms?
  3. Let students know that adoption is worth considering if they want to bring an animal into their lives. There are humane societies, SPCA's (Society for the Prevention of Cruelty to Animals), and animal rescue organizations that take care of all different species of animals (including fish, birds, and reptiles) when the animal is in a home where his/her needs can no longer be met or in a situation where s/he was mistreated.
  4. Provide time for students to write a short reflection to share how they think and feel about fish living in captivity as compared to living in the wild.

### **Extension**

- Option 1: Invite students to work independently, in pairs, or in groups and to choose another animal species to research (e.g., parakeet, iguana, betta fish). Challenge students to identify what this specific animal species needs to be happy, healthy, and comfortable. Then, ask the students to compare and contrast what these animals' lives are typically like in their natural habitat versus when they are kept as pets. Ask students to determine if they think it is preferable for these animals to live in the wild or in captivity and to explain why.
- Option 2: Ask students to think of an individual animal they know (e.g., their own animal, a relative's animal, a classroom pet). Have them research the needs of that animal species, but also observe what that individual animal needs to be happy, healthy, and comfortable (e.g., a cat who is sad when she can't find her favorite toy, a dog who is really scared when he hears loud sounds such as fireworks, a rat who prefers watermelons over grapes). Identify how this individual animal's Five Freedoms are being met, and create an animal care list

to identify additional ways to improve this individual animal's life based on his/her personal likes and dislikes.

## **The Five Freedoms**

The Five Freedoms represent the basic protections that every animal deserves as a living being. All animals need these freedoms to be happy, healthy, and comfortable. These freedoms were created as a guide to help people know how to provide for all the needs of an animal who is in their care. The Five Freedoms are listed below, including details on providing each freedom for a fish.

1. **Freedom from hunger and thirst** (food and water): All animals need fresh water and healthy food. A fish needs to live in unpolluted water. It is important that every fish is provided the right type and amount of food for their species so that they are healthy.
2. **Freedom from discomfort** (proper shelter): All animals need a safe and comfortable place to live. Providing a proper environment for a fish is a lot of work. Each fish needs a certain water temperature, air flow to keep the right oxygen levels in the water, and hiding places where fish can rest or be alone (e.g., rocks, plants, caves).
3. **Freedom from pain, injury, or disease** (safety and vet care): Animals need to live in an environment that is clean and safe for their health. To know when a fish is not feeling well, we need to know how the fish looks and acts when s/he is healthy. For example, blood parrot fish are bright orange when they are healthy, but when they are sick, they have black spots on their body. A fish who is healthy usually swims around a lot, but when they are sick, they swim less and they will seem tired. Sometimes when fish are sick, they spend a lot of time at the bottom of their environment or they might swim on their side. When fish are sick, they might eat less or not eat at all. When fish are not well, they need a veterinarian.
4. **Freedom to express normal behavior**: Animals have natural behaviors that they express when they are healthy and in a proper environment with enough space to move around. To create a space where fish can express their natural behaviors, it is important to know the fish well. Research what the fish likes to do and what the fish does to feel safe. Just like people, animals can get bored and lonely. Fish need toys and activities so that they have something to do. Give them new things sometimes, such as a floating or sinking ball, or a food puzzle. Also, most fish are social, and it is



part of their natural behavior to be around fish of their own species to feel safe and happy.

5. **Freedom from fear and distress** (love): Animals need to be free from fear, and that comes from providing them with a safe place to live and showing them love and care. Spend time with the fish in your care and give them attention. Many species of fish can recognize people, and the fish in your care will get to know you. The better you know a fish, the more you will be able to recognize how they are feeling so that you can provide them with an environment where they feel comfortable and happy.

## **Lesson 5 – Protecting Waterways for People and Animals**

**Grades:** 3 - 4

### **Vocabulary:**

- Climate change
- Commercial fishing
- Coral bleaching
- Plastic pollution

### **Objectives:**

Students will be able to...

- collaborate in small groups to ask and answer questions about an informational text and gain knowledge about an environmental threat to waterways.
- develop a presentation to discuss an environmental threat and potential solutions.
- express how they feel about the impact that environmental threats are having on people, animals, and the natural world.
- identify at least one way they can take action to protect waterways for people and aquatic animals.

### **USA Common Core State Standards (CCSS)**

CCSS.ELA-LITERACY.RI.3.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

CCSS.ELA-LITERACY.RI.4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

### **Next Generation Science Standards (NGSS)**

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LS4.D: Biodiversity and Humans - Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

ESS3.A: Natural Resources - Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. (4-ESS3-1)

### **Collaborative for Academic, Social, and Emotional Learning (CASEL)**

CASEL SEL Competencies: Responsible Decision-Making

### **Humane Education Coalition - Core Components of Humane Education (CCHE)**

[CCHE](#): 1:A,B,C,D,F,G,H; 2:A,B,C,H; 3:A,C,D,E; 4:A,B,C,D,F; 5:A,B,C

#### **Materials Needed:**

- 4 sheets of chart paper (See Body step 1 for how to prepare materials in advance)
- A crayon for each student
- Fact sheets on the following topics: commercial fishing, coral bleaching, plastic pollution, and climate change – 1 per student based on the group they are in (provided below, following the lesson plan)
- *Research Notes* worksheet – 1 per group (provided below, following the lesson plan)

#### **Lesson Procedure**

##### **Opening**

1. Ask students to turn and talk to a partner about potential dangers they think fish like Ava and Archie, and other aquatic animals, are experiencing. Invite students to share and acknowledge all their ideas.
2. Introduce students to the following threats to the Earth's waterways if they were not discussed and let students know that they are going to learn about each one:
  - Climate change
  - Commercial fishing
  - Coral bleaching
  - Plastic pollution

##### **Body**

1. Have four sheets of chart paper around the room. Each sheet should have one of the four topics listed on top and two columns. One column heading should be “What I Know” and the other column heading should be “What I Want to Know.”
2. Invite students to go to each chart paper sheet and either write one thing they know about the topic and one question they have, or write two questions they have about the topic under the appropriate column. (Let students know that it is okay if the topic is completely new to them. Also, ask them to take a moment to consider if what they know is definitely a true statement or something they think they know.) After everyone has finished, review what has been written on each chart paper sheet.
3. Have students stand near the topic that they want to learn more about. (Depending on how many students are interested in each topic, you may need to divide them into smaller groups. For example, if there are ten students interested in plastic pollution, divide them into two groups of five.)

### Activity

1. Provide each student with a fact sheet on the topic that corresponds to their group and provide each group with a *Research Notes* worksheet. Students will explore the following questions:
  - What is the issue?
  - What are the causes?
  - What are the consequences for people, animals, and the environment?
  - What are possible solutions?
2. Each group will choose how they want to present the information they learned to the rest of the class (e.g., making posters, developing a slideshow presentation, creating a song, writing a poem). Ask them to include (1) information that answers the questions they explored in Activity step 1, and (2) how they feel about the way their respective environmental threat is affecting people, animals, and the environment. They will work together to create their presentation.
3. Provide time for students to share their presentations with the class. Before the presentations begin, discuss with students how to be a thoughtful audience. Ask each student to write down any questions they have during the presentation so they can ask their questions at the end. Also ask them to write down one thing they learned or that they thought was important from each presentation.

### Closing

1. Have students reflect on personal and systemic ways they think people can protect waterways for aquatic animals, people, and the environment (either orally or by journaling). Consider inviting students to stand in a circle afterward and share one action that they think they can take to protect waterways.

### **Extension**

- Option 1: Take students to a nearby waterway or a park for a community clean-up (and explain how litter on the ground can end up in waterways).
- Option 2: Organize a canoe or kayak field trip so that students can experience the wonder of the natural world and see the aquatic animals in their community.
- Option 3: Invite an environmental scientist to your class (either in-person or virtually) so that students can learn more about threats facing waterways and aquatic animals, and learn about actions that are being taken to protect the environment.

## Climate Change

**What is it?:** Climate change is the way that weather patterns and temperature (over a long period of time) are being changed by human actions.

**Causes:** Human activity -- specifically, using fossil fuels that power cars, factories, homes, and much more -- is causing the planet to warm. An example of fossil fuels is oil that people dig from deep underground and burn for energy. When burned, fossil fuels release gases that pollute the air. The pollution forms a layer around the Earth in the air (or in the atmosphere). The sun's energy can pass through this layer of pollution, but then it gets trapped inside and heats the air. This has gradually increased the temperatures we experience on Earth and is called the greenhouse effect.

**Consequences:** A warmer planet might not seem like a big deal, but it can cause serious problems. It is causing sea levels to rise, more droughts, heat waves, wildfires, and hurricanes. This can affect our ability to grow food and protect habitats, and can make certain areas unsafe for human, animal, and plant life.

**Solutions:** We can survive without fossil fuels. In fact, we can live similarly to the way we do now by replacing our energy sources from oil and natural gas with renewable energy like solar, wind, and geothermal power. We can also use less energy by shopping locally, growing our own food, and eating more plant-based foods because these actions create fewer greenhouse gases (the pollution that causes the greenhouse effect). We can also make sure that our lawmakers understand climate change and are working to pass laws to reduce energy that comes from fossil fuels.

To learn more, visit: <https://climatekids.nasa.gov/climate-change-meaning/>

## **Commercial Fishing**

**What is it?:** Commercial fishing takes place when companies, rather than individuals, fish in order to make money by selling the fish they catch. It is often done on large boats, typically with nets that catch huge amounts of fish at once.

**Causes:** Many people around the world eat fish and are willing to pay others to catch them. When people buy fish from the grocery store, the fish comes from a commercial fishing operation.

**Consequences:** “Overfishing,” in which too many fish are taken from the ocean, causes ecosystems to become out of balance because so many animal species are missing. Some of the techniques used to catch fish involve “trawling” or dragging a net and catching anything and any animal in its path. This means that there can be a large amount of “bycatch,” or creatures who are caught unintentionally. For example, when fishing for tuna, bycatch can include sharks, whales, or crustaceans. These animals are often released back into the ocean when either dead or dying. Fishing itself, which uses boats that pollute and techniques that can damage ecosystems, also harms ocean habitats. Another important consequence of fishing is for the fish themselves. Being caught is stressful, painful, and the end of life for billions of fish per year.

**Solutions:** Not buying fish reduces the demand for commercial fishing companies to take so many fish from the ocean. When fewer people buy fish, fewer companies take them from the ocean. Working to educate others to help protect areas of our oceans is another way you can help!

To learn more, visit: <https://sciencejournalforkids.org/key-word/overfishing/>

## **Coral Bleaching**

**What is it?:** A reef is a big group of rocks on the ocean floor, but a coral reef is alive. Very small animals called corals glue their tiny skeletons to rocks and they end up staying in that same place for their entire lives. The rocks are completely covered in the corals. When the corals release the algae that lives on them and they turn completely white, it is known as coral bleaching.

**Causes:** Coral bleaching happens when the corals are under stress. Coral reefs are very sensitive to light, harmed when the temperature becomes too hot or too cold (which is happening rapidly because of climate change), and affected by ocean pollution. Storms can also harm the corals, especially when they occur often and when they are severe. All these situations can cause the corals stress.

**Consequences:** Coral bleaching causes corals to become sick and vulnerable. It can even cause them to die, especially if they are under stressful conditions for too long. Healthy coral reefs are a colorful wonder and add to the beauty of our ocean. If we do not take action, all the coral reefs might disappear. Many other marine animals depend on them for food and shelter. They also help people because they prevent coastal erosion and offer protection from strong storms.

**Solutions:** We can protect coral reefs by using less plastic to prevent litter from ending up in the ocean and by supporting laws to reduce plastic use in our communities. We can also take actions and support laws that will help to slow down the effects of climate change, which can impact the coral reefs' habitat.

To learn more, visit: <https://climatekids.nasa.gov/coral-bleaching/>

## Plastic Pollution

**What is it?:** Plastic pollution results from the plastic humans have used that ends up in our environment and causes harm to people, animals, and the natural world.

**Causes:** When plastic was first made, most people did not know about the harm it caused. People like to use plastic bags to carry things they buy at the store, plastic forks and spoons for take-out, and plastic cups and straws to drink beverages. Companies also make many products out of plastic like chairs, water bottles, blenders, sandals, computers, and toys. Plastic is also used to package our food at the grocery store and other products we buy. Think about all the plastic you see in a day.

**Consequences:** Plastic is made from oil and releases chemicals into the environment that can cause people to get sick. When plastic is littered, it can harm animals like seabirds who mistake the plastic for food. Fish can accidentally eat the small pieces of plastic that are in the ocean. Sometimes animals get caught in plastic bags.

**Solutions:** Some people are reducing their plastic use. Instead of using plastic straws, they choose reusable metal straws; instead of using plastic bags at the store, they bring their own cloth bags; and instead of buying plastic bottles, they fill a reusable bottle. Some people also write letters to the government to encourage legislators (lawmakers) to pass laws that reduce plastic. For example, some cities no longer allow free plastic bags to be given out at stores. There are also some companies that are using less plastic packaging by creating packaging that is biodegradable, which means it will break down and go back into the soil. As people, the government, and companies each do their part to use less plastic, we can help to prevent human health issues caused by plastic, and we can protect animals and keep our environment clean.

To learn more, visit: <https://kids.nationalgeographic.com/nature/kids-vs-plastic/article/pollution-1>



**Research Notes**

**Group members' names:** \_\_\_\_\_

\_\_\_\_\_

**1. Topic:** \_\_\_\_\_

**2. What is it?** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**3. What are the causes?** \_\_\_\_\_

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**4. What are the consequences?** \_\_\_\_\_

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**5. What are possible solutions?** \_\_\_\_\_

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