Camouflage

Adjectives and Fractions

Grade: 3-5	Implementation Practice: Whole Class - Small Group - Individual
Subject Areas: Science - camouflage; Language - adjectives and conjunctions ; Math - fractions	Estimated Duration: three, 45 minute sessions - Opening Discussion & Part 1: 45 minutes - Part 2: 45 minutes - Part 3 & Cumulative Review: 45 minutes

Objective(s):
Students will:

- understand that animals have needs that must be met for survival.
- recognize that camouflage helps some animals survive.
- use adjectives to describe living things that use camouflage.
- write complete sentences that use superlative and comparative adjectives.
- use conjunctions to combine two sentences.
- express a part of a whole as a fraction.
- compare and compose fractions with like denominators.
- solve equations involving the addition, subtraction, multiplication, and division of fractions.

Standards Addressed

NGSS	In support of Performance Expectations		
	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.	4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
	Disciplinary Core Idea(s) ● LS4.C: Adaptation ● LS1.A: Structure and Function ● LS2.A: Interdependent Relationships in Ecosystems ● LS2.B: Cycles of Matter and Energy Transfer in Ecosystems		
	Cross Cutting Concepts(s) ● Cause and Effect ● Systems and System Models		
	Science and Engineering Practice(s) ● Analyzing and Interpreting Data ● Constructing Explanations and Designing Solutions ● Engaging in Argument from Evidence ● Developing and Using Models		

CCSS	**English Language Arts** Conventions of Standard English ● Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.	**Mathematics** Number and Operations - Fractions ● Develop understanding of fractions as numbers. ● Extend understanding of fraction equivalence and ordering. ● Use equivalent fractions as a strategy to add and subtract fractions. ● Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Vocabulary and Skills

Key Terms		Key Skills
adaptation	natural resources	cause and effect
blend	predators	compare and contrast
camouflage	prey	observe
energy	survival	writing and comparing fractions
environment	terrestrial	recognize patterns
invertebrate	vertebrate	

Teacher Background Information

Living things have needs that must be met in order for them to survive. Animals use Earth's natural resources to meet these needs. Animal needs include food, water, air, and shelter. Our world has a large diversity of living things in many different types of environments. Animals live in environments where they can meet their individual needs.

Animals have adaptations that help them meet their needs and survive in their environment. Animal adaptations include a monkey's tail, a giraffe's neck, an elephant's trunk, and a leopard's spots. Camouflage is a special adaptation that some animals use to increase their chances of survival.

Camouflage allows an animal to blend in with its surroundings, making it less likely that it will be noticed by other animals. Predators use camouflage to surprise their prey and catch a meal, and animals that would be prey use camouflage to avoid being noticed so they are less likely to get eaten.

When a predator eats its prey, some of the energy from the prey is transferred to the predator; this is how the predator gets the energy it needs to survive. In this way, all living things are connected to the other living things around them. The energy from one living thing can be used to help another living thing meet its needs for survival.

Essential Question(s):

- How does the adaptation of camouflage increase an animal's chance of survival?
- How does camouflage affect the predator/prey relationship?
- What types of words can be used to describe and compare objects?
- How do you name a quantity that represents a part of a whole?

Advance Preparation

- Preview the video, images, and facts within the Camouflage Explorer Series.
- Set up a computer to project the teacher's screen to the class.
- Gather materials:
    - chart paper and marker, for the teacher
    - student science journals or appropriate writing paper, for each student
    - student printable, *Part of the Group,* for each student
    - student printable, *Predator/Prey Relationship,* for each student

Potential Misconceptions

- All living things have the same capabilities.
- Living things can survive in any environment.
- Any living thing can survive in a particular environment.
- An animal cannot be both predator and prey.
- Animals do not depend on the other living things around them to meet their needs.

Lesson Plan

Opening Discussion (10 - 15 min)

1. Activate prior knowledge of relevant background information.
   Ask students to:
    - list the needs of living things.
    - compare the needs of plants with the needs of animals.
    - compare the needs of ocean animals to the needs of land animals.
    - describe the different ways that animals meet their needs.
    - name the natural resources in an environment that living things use to meet their needs.
2. Explain to the students that they will be adding to what they know about the needs of living things and the different ways animals meet those needs by learning more about camouflage.

3. Activate prior knowledge about camouflage. Record their responses on chart paper to hang in the classroom for reference.
   Ask students to:
   - explain what they know about the concept of camouflage.
   - name examples of animals that they think use camouflage.
   - explain why they think animals use camouflage.

4. State Objectives: Tell students that they will be completing a three part lesson about camouflage.
   - In the first part of the lesson, they will describe the living things that use camouflage by writing simple and compound sentences that use superlative and comparative adjectives.
   - In the second part of the lesson, they will be drawing models to show how energy transfers through an environment from prey to predator.
   - In the third part of the lesson, they will identify the animals featured in the lesson as vertebrates or invertebrates and then write and work with fractions that represent each part of the whole group.

Part 1 (30 - 35 min)

1. Explain to students that they will be viewing a lesson online that will teach them more about camouflage. Tell them to pay attention and look to confirm what they thought to be true about camouflage and also look for new facts that will add to their understanding of camouflage.
2. As a group, view the video and the five slides with images of camouflaged animals. Point out the different colors, shapes, and patterns that are used by the animals to camouflage themselves.
3. Ask students to name one fact that was confirmed in the video or images and one new fact that they learned from the video or images.
4. Read the slide, Five Facts about Camouflage. As needed, elaborate to explain the facts to meet the students at their level.
5. Activate prior knowledge of adjectives. Ask students to name some words that describe the animals in the lesson. (e.g., shape, color, pattern, size) Remind students that these describing words are called adjectives and that adjectives describe nouns. Remind students that comparative adjectives are used to compare one noun to another noun (The octopus is *larger* than the shrimp) and superlative adjectives are used to compare three or more nouns (The octopus is the *largest* animal in the group).
6. Build on Knowledge: Draw a three-column table on chart paper. In the first column write a few adjectives, such as pretty or small. In the second column, write the comparative form of each adjective (prettier, smaller). In the third column, write the superlative form of the adjective (prettiest, smallest). Ask students to name adjectives that describe the living things from the lesson. Add them to the chart together and write the comparative and superlative form of each.
7. Check for Understanding: Ask students to identify adjectives as regular, comparative, or superlative. Read an adjective out loud. Ask students to hold up one finger if the

adjective is in regular form, two fingers if it is a comparative adjective, and three fingers if it is a superlative adjective.

8. In their science journals or on notebook paper as appropriate, students should write four complete sentences. One sentence that uses an adjective in regular form, one that uses a comparative adjective, and one that uses a superlative adjective. The fourth sentence should use a conjunction to combine two of their sentences together to make one compound sentence.
9. Allow students time to share their sentences with peers either with partners or to the whole group. Students should be able to identify:
    a. one regular adjective.
    b. one comparative adjective.
    c. one superlative adjective.
    d. one conjunction.

Part 2 (40 - 45 min)

1. Review what was learned in Part 1 about:
    a. animal needs.
    b. camouflage.
2. Activate prior knowledge about how camouflage can impact the predator/prey relationship.
   Ask students to:
    a. name an example of an animal that uses camouflage to be a better predator.
    b. name an example of an animal that uses camouflage to avoid becoming another animal's prey.
    c. explain what they know about the relationship between a predator and prey.
3. Tell students that in this part of the lesson they will be building on what they know about camouflage by learning more about how this adaptation impacts the predator/prey relationship.
4. As a group, rewatch the video and view the images from the lesson again. Encourage students to identify where they see animals using camouflage as a predator and where they see animals using camouflage to avoid becoming prey.
5. Read the last two slides, Five Facts about Camouflage and Dive Deeper. Lead a discussion that identifies the role of camouflage in the predator/prey relationship.
6. Distribute materials:
    a. student handout, *Predator/Prey Relationship*
6. Students should work independently or with partners as appropriate to complete the handout. Circulate and assist as needed.
7. Lead a discussion that allows students to share their models with peers. Students should be able to explain how camouflage impacts the predator/prey relationship and how energy flows through an environment from prey to predator.

Part 3 (30 - 35 min)

1. Review what was learned in Part 1 and Part 2 about:
    a. animal needs.
    b. camouflage.
    c. predator/prey relationship.
2. Activate prior knowledge about fractions.
   Ask students to:
    a. explain what they know about fractions.
    b. tell the name of the top number in a fraction.
    c. tell the name of the bottom number in a fraction.
3. Tell students that in this part of the lesson they will be classifying the animals in the lesson as vertebrates or invertebrates and writing fractions to represent what part of the whole each group represents.
4. As a group, rewatch the video and view the images from the lesson again. Help students identify eight animals featured in the lesson. (frogfish, grouper, stonefish, ghost pipefish, octopus, shrimp, sea horse, crab) On chart paper, create a two-column table. Label the left column, *Vertebrates*, and the right column, *Invertebrates*. Help students classify each animal as a vertebrate, an animal with a backbone, or an invertebrate, an animal without a backbone.
5. Distribute materials:
    a. student handout, *Part of the Group*.
6. Students should work independently or with partners as appropriate to complete the student handout, *Part of the Group*. (Circulate and assist as needed, or project the student handout and complete as a group.)
7. As time permits, as a group work together to create equations or word problems using the fractions. Depending on student levels, create problems that use addition, subtraction, multiplication, and division. Use models as a strategy to solve when appropriate.

Overall Review (10 - 15 min)

1. Lead a class discussion that reviews the key science, language, and math concepts that were practiced during all parts of the lesson. Remind students that:
    a. animals have needs that must be met in order for them to survive.
    b. animals have adaptations, such as camouflage, that help them meet their needs.
    c. camouflage can help an animal be a more successful predator.
    d. camouflage can help an animal avoid becoming prey.
    e. camouflage can increase an animal's chance of survival.
    f. an animal can be both a predator and prey.
    g. predators get the energy they need by eating other living things, prey.
    h. adjectives are words that help us to describe objects.
    i. fractions are numbers that represent a part of a whole.

Extension Ideas

Read More:

To further increase student awareness of different animals that use camouflage to increase their chance of survival, read and discuss any of the poems from the book, *Now You See Them, Now You Don't - Poems About Creatures That Hide written* by David L. Harrison and illustrated by Giles Laroche.

Step it Up:

Build a food web that traces the flow of energy from one living thing to another. Add to the food chain model from the Predator/Prey Relationship activity and create a food web. Identify each living thing included in the model as prey, predator, or both. As time and materials allow, either draw a food web or build a model using 3D materials. Present final product orally to peers. Students should be able to explain how energy flows through their model.

Step it Back:

For students who may need extra assistance and/or repeated exposure to the concepts presented in the lesson:

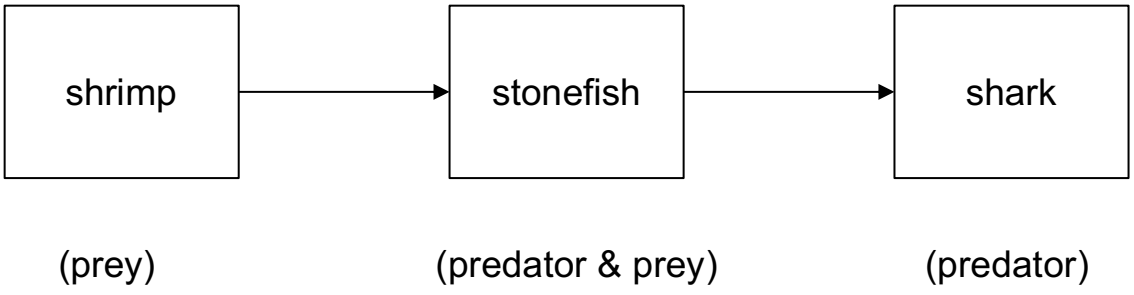
- Allow students extra time to view the Camouflage Explorer Series lesson on individual devices.
- Use chart paper to create a word bank of adjectives; be sure to include regular adjectives, comparative adjectives, and superlative adjectives. Display the chart during Part 1 of the lesson for the whole class, or create copies to give to individual students.
- During Part 2 of the lesson, project from the teacher's computer the student handout, *Predator/Prey Relationship*, and complete it as a group. Model for students how to create a food chain that shows how a predator and its prey are connected.
- During Part 3 of the lesson, from the teacher's computer, project the student handout, *Part of the Group*, and complete it as a group. Model for students how to write the numerators and denominators and how to compare the fractions.

Predator/Prey Relationships - KEY

The stonefish uses camouflage to help it meet its needs and increase its chances of survival. Using camouflage helps the stonefish blend into its surroundings. This helps the stonefish be a better predator; it is able to surprise the animals it eats like shrimp or small fish. Blending into its surroundings also helps the stonefish to avoid becoming prey for larger animals that would eat it, like sharks or rays.

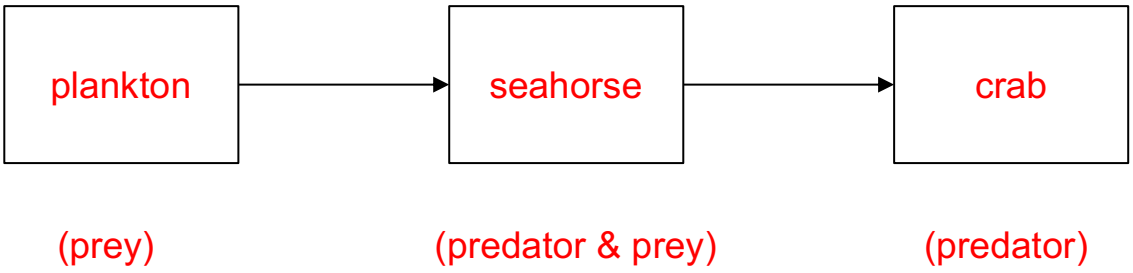
When the shrimp (the prey) is eaten by the stonefish (the predator) the energy from the shrimp transfers to the stonefish. When the stonefish (the prey) is eaten by the shark (the predator) the energy from the stonefish transfers to the shark. This shows that the stonefish both gives and receives energy.

Stonefish: Predator/Prey Relationship



Think of another animal from the lesson that can be both predator and prey. In the space below, draw a model similar to the one of the stonefish that explains the predator/prey relationship the animal has with the other living things in its surroundings.

Answers may vary. Models should be similar to the example model above and correctly identify each living thing as a predator, prey, or both.



In the space below, use words and drawings to summarize what you know about the different ways animals use camouflage to increase their chances of survival.

As a Predator	As Prey
Answers may vary. Student explanations should show how a predator can use camouflage to blend into its surroundings and surprise prey. For example, students could draw: • an animal from the lesson such as a frogfish, showing how it blends into the coral of the reef to surprise small fish. • an animal they know from their personal prior knowledge, such as a chameleon blending into a tree to surprise the insects it eats. Look for students to label their drawings with relevant vocabulary.	Answers may vary. Student explanations should show how an animal can use camouflage to blend into its surroundings to avoid becoming prey. For example, students could draw: • an animal from the lesson such as a ghost pipefish, showing how it blends in with the seagrass to avoid being noticed by predators. • an animal they know from their personal prior knowledge, such as a tree frog blending in with a tree to avoid becoming prey. Look for students to label their drawings with relevant vocabulary.

Part of the Group - KEY

Classify the living things from the lesson as vertebrates, animals with a backbone, or invertebrates, animals without a backbone.

Living Things

Vertebrates	Invertebrates
1. frogfish 2. grouper 3. stonefish 4. ghost pipefish 5. sea horse	1. octopus 2. shrimp 3. crab

A fraction represents a quantity less than one. It shows part of a whole.
Write a fraction that shows:

- the part of the group that are vertebrates.
- the part of the group that are invertebrates.

The denominator, or the bottom number, represents the number of objects in the whole group.

1. How many living things are there in the whole group? 8
2. What should the denominator of the fractions be? 8

In a fraction, the numerator, or the top number, represents the part of the whole.

3. How many of the living things in the group are vertebrates? 5
4. What should the numerator in that fraction be? 5
5. Write the fraction that shows what part of the group are vertebrates. $\frac{5}{8}$
6. How many of the living things in the group are invertebrates? 3
7. What should the numerator in that fraction be? 3
8. Write the fraction that shows what part of the group are invertebrates. $\frac{3}{8}$

Compare the fraction of animals that are vertebrates to the fraction of animals that are invertebrates. (Use the symbols >, <, or =) $\frac{5}{8} > \frac{3}{8}$

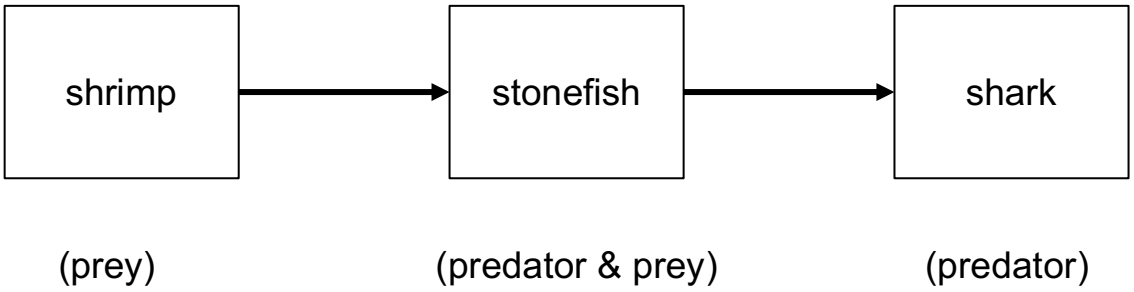
Name _____ Date _____

Predator/Prey Relationships

The stonefish uses camouflage to help it meet its needs and increase its chances of survival. Using camouflage helps the stonefish blend into its surroundings. This helps the stonefish be a better predator; it is able to surprise the animals it eats like shrimp or small fish. Blending into its surroundings also helps the stonefish to avoid becoming prey for larger animals that would eat it, like sharks or rays.

When the shrimp (the prey) is eaten by the stonefish (the predator) the energy from the shrimp transfers to the stonefish. When the stonefish (the prey) is eaten by the shark (the predator) the energy from the stonefish transfers to the shark. This shows that the stonefish both gives and receives energy.

Stonefish: Predator/Prey Relationship



Think of another animal from the lesson that can be both predator and prey. In the space below, draw a model similar to the one of the stonefish that explains the predator/prey relationship the animal has with the other living things in its surroundings.

In the space below, use words and drawings to summarize what you know about the different ways animals use camouflage to increase their chances of survival.

As a Predator	As Prey

Name _____ Date _____

Part of the Group

Classify the living things from the lesson as vertebrates, animals with a backbone, or invertebrates, animals without a backbone.

Living Things

Vertebrates	Invertebrates
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	
5. _____	

A fraction represents a quantity less than one. It shows part of a whole.
Write a fraction that shows:

- the part of the group that are vertebrates.
- the part of the group that are invertebrates.

The denominator, or the bottom number, represents the number of objects in the whole group.

1. How many living things are there in the whole group? _____
2. What should the denominator of the fractions be? _____

In a fraction, the numerator, or the top number, represents the part of the whole.

3. How many of the living things in the group are vertebrates? _____
4. What should the numerator in that fraction be? _____
5. Write the fraction that shows what part of the group are vertebrates. _____
6. How many of the living things in the group are invertebrates? _____
7. What should the numerator in that fraction be? _____
8. Write the fraction that shows what part of the group are invertebrates. _____

Compare the fraction of animals that are vertebrates to the fraction of animals that are invertebrates. (Use the symbols >, <, or =) _____