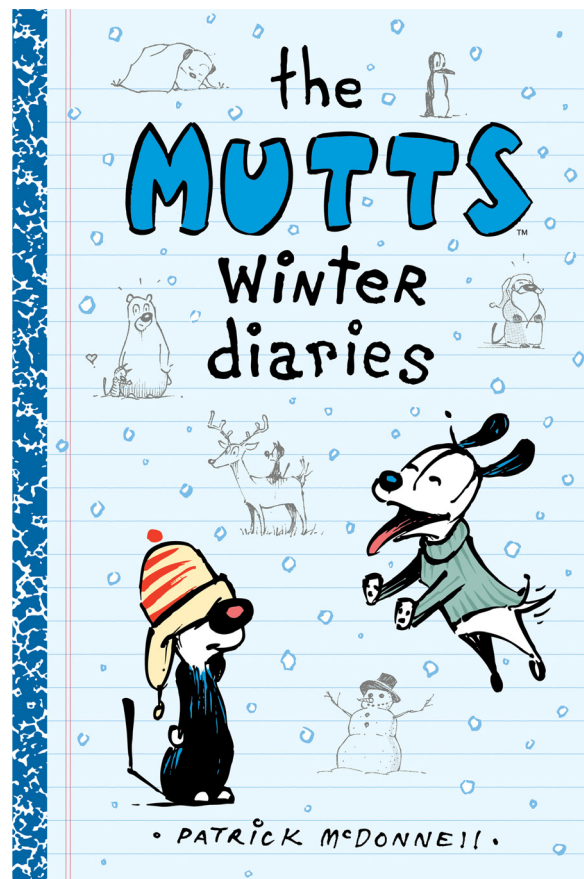


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TEACHER'S GUIDE



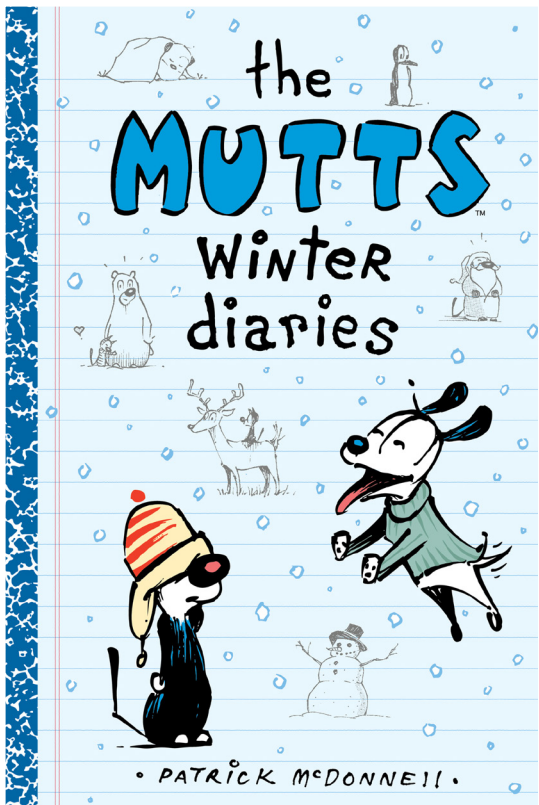
The Mutts Winter Diaries

Curriculum Connections and Activity/Discussion Guide

The activities in this guide align with Next Generation Science Standards and Common Core State Standards for grades 3–5.

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Reading With Pictures





The Mutts Winter Diaries

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AMP! Comics for Kids

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GRADE LEVEL: 3–5

CURRICULUM CONNECTIONS:

Science—Animal Adaptations

English Language Arts—Writing

CONTENT STANDARDS:

Next Generation Science Standards: www.nextgenscience.org

Common Core State Standards: www.corestandards.org

OVERVIEW:

Students will read *The Mutts Winter Diaries* and discuss how the characters deal with winter weather. Then, students will discuss and research the ways that animals survive during winter, including hibernation, migration, and adaptation. Finally, students will use creative expression to report on what they learned about animals in winter.

Science

GRADE 3

- * Construct an argument that some animals form groups that help members survive. [3-LS2-1]
- * Use evidence to support the explanation that traits can be influenced by the environment. [3-LS3-2]
- * 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. [3-LS4-3]

GRADE 4

- * Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [4-LS1-1]
- * Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. [4-LS1-2]

GRADE 5

- * Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [5-PS3-1]

English Language Arts

GRADE 3

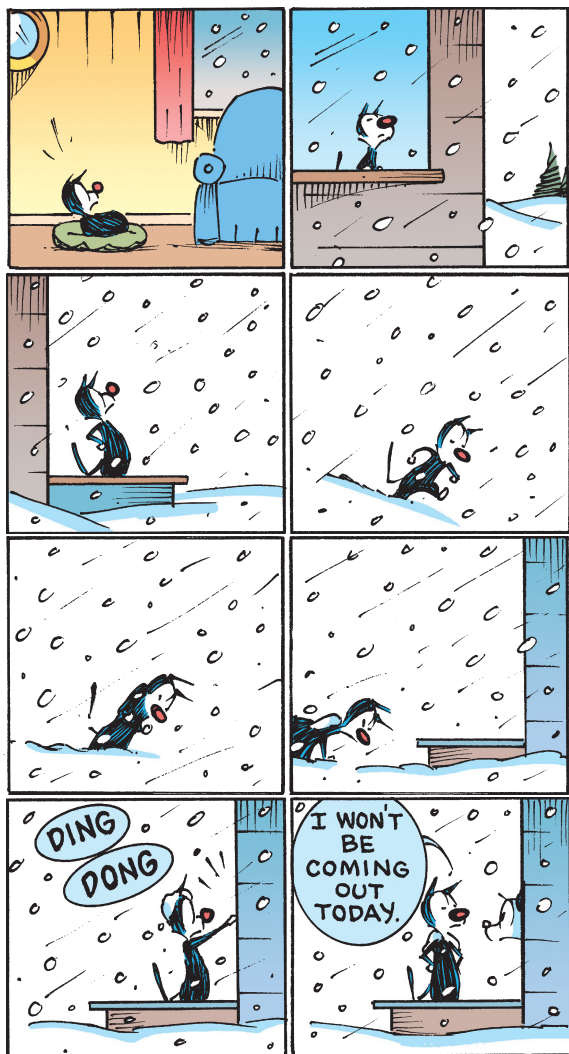
- * Conduct short research projects that build knowledge about a topic. [CCSS.ELA-Literacy.W.3.7]
- * Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. [CCSS.ELA-Literacy.W.3.8]

GRADE 4

- * Conduct short research projects that build knowledge through investigation of different aspects of a topic. [CCSS.ELA-Literacy.W.4.7]
- * Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. [CCSS.ELA-Literacy.W.4.8]

GRADE 5

- * Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. [CCSS.ELA-Literacy.W.5.7]
- * Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. [CCSS.ELA-Literacy.W.5.8]



Procedure

OBJECTIVES

- * Students will record what they already know and what they would like to learn about animal behavior in winter.
- * Students will read *The Mutts Winter Diaries* and identify ways the characters deal with winter weather.
- * Students will discuss the survival needs of animals, the challenges to meeting those needs in winter, and how animals overcome those challenges through hibernation, migration, or adaptation.
- * Students will research how a specific animal survives in winter weather, focusing on hibernation, migration, or adaptation.
- * Students will use creative expression to share what they learn about an animal that hibernates, migrates, or adapts in winter.
- * Students will record what they learn about animals in winter.

TIME FRAME

- * 3-5 class periods, plus time for student research

MATERIALS

- * Copies of *The Mutts Winter Diaries*
- * Chart paper/whiteboard
- * Markers
- * Highlighter pens
- * *KWL: Animals in Winter Weather* worksheet
- * *Animal Adaptations: Hibernate, Migrate, or Adapt* handout
- * *Winter Animal Presentation* assignment sheet

BEFORE READING

1. Allow students a few minutes to look through *The Mutts Winter Diaries* without reading the text. Ask students to predict what they think the book will be about and who the characters are. Remind them that, in comics, information comes from both pictures and words (as well as the way they work together). Have students make predictions based on visual cues.
2. Tell students that they will be reading about the Mutts characters in winter. Activate students' prior knowledge by asking them to each turn and talk to a partner about what he or she knows about winter weather. If you live in a temperate climate, lead a class discussion about winter weather in areas where it gets very cold and what it's like to be outside in cold temperatures and snow.
3. Give students copies of the *KWL: Animals in Winter Weather* worksheet and have them work in pairs or small groups to complete the first two columns of the chart. Have students share what they know about animals in winter and record their knowledge

in the first column (*What We Know*). Then, have students share what they wonder or would like to learn about animals in winter and record their thoughts in the second column (*What We Wonder*). Tell students that after they have read the book and completed some activities, they will fill in the final column with what they have learned (*What We Learned*).

DURING READING

4. Tell students that their purpose for reading *The Mutts Winter Diaries* will be to identify ways in which the characters try to adapt to winter weather. Give students sticky notes. Tell them that, as they read, they should place sticky notes on pages or sections of the book that show the animal characters taking specific actions to try to adapt to winter weather. For example, on page 21, the bird fluffs up his feathers to keep warm, and on pages 72–77, Mooch and Earl eat a lot of food to prepare to hibernate. (If sticky notes are not available, students can tuck small scraps of paper between the pages like bookmarks.)



AFTER READING

5. Have students share the specific actions that the characters took to try to adapt to winter weather. Record the actions on chart paper or a whiteboard. Examples: *Hibernate; Put on warm clothes; Fluff up fur or feathers; Stay indoors; Migrate to a warmer place.* Review the list and discuss which actions real animals in the wild could use to adapt to winter weather and which are not realistic.
6. Create a three-column chart on chart paper, a whiteboard, or an overhead display. Label the first column “Animal Needs,” the second column “Winter Challenges,” and the third column “Winter Adaptations.” As a class, brainstorm a list of animals’ needs for survival (e.g., food, shelter, climate, avoiding predators) and write them in the first column. Then, ask students to think of ways that each need is challenged during winter and record responses in the second column. Finally, have students think about ways that animals might adapt to the winter challenges they face. See the example chart below.
7. Underneath the completed chart, write the words *Hibernate, Migrate, and Adapt*. Explain to students that the things animals do to deal with winter fall into these three categories. Distribute or display the handout *Animal Adaptations: Hibernate, Migrate, or Adapt*, and read through the information as a class or in small groups.
8. Return to the class chart created in step 6. Highlight each term (*Migrate, Hibernate, and Adapt*) with a different color highlighter. Then, have students use the highlighters to mark each adaptation in the Winter Adaptations column as a form of hibernation, migration, or adaptation by using the corresponding colors.
9. Tell students that they will each be doing research, and presenting a report to the class, on one animal that hibernates, migrates, or adapts in winter. Distribute copies of the *Winter Animal Presentation* assignment sheet to students and review the criteria with them. Tell students that they are each to choose one animal that hibernates, migrates, or adapts. They each may need to do a bit of research before choosing an animal.

| Animal Needs What do animals need to survive? | Winter Challenges How is this part of survival more difficult in winter? | Winter Adaptations What can animals do to meet the winter survival challenge? |
|--|---|--|
| Food | Plants die or lose their leaves No fruit or nuts Plants covered in snow Prey is hibernating or migrated away | Eat more food when it’s warmer and store fat, hibernate to save energy Save food for the winter Migrate to warmer area with more food Eat different types of food |
| Shelter/warmth | Cold temperatures, often below freezing | Thicker fur Hibernate Build a warm nest or burrow Migrate to warmer area |
| Avoid predators | Dark animals stand out against white snow Move slower because it’s colder | White fur for camouflage Hibernate Migrate |



10. Provide time and resources for students to do research and create presentations. If you will be using the rubric below for assessment, share it with students so they will know what is expected.
11. Have students give their presentations to the class. Encourage audience members to take notes on the presentations, recording any information that they did not know before.
12. After students have given their presentations, have them use their notes to go back and complete the last column of their KWL charts, "What We Learned."

ASSESSMENT

Use the following rubric to assess student learning as shown in their presentations. If you will be using this rubric to assess students, be sure to share it with them at the beginning of the assignment so they will understand what is expected.



| Criteria | 3 points | 2 points | 1 point | 0 points |
|--|--|---|--------------------------------------|---|
| Presentation includes written facts about the animal's adaptation. | Includes a great deal of factual information. | Includes some factual information. | Includes little factual information. | Includes no factual information. |
| Presentation includes visual displays. | Includes high-quality, interesting, relevant visual displays. | Includes interesting, relevant visual displays. | Includes relevant visual displays. | Does not include visual displays. |
| Includes list of research sources. | Cites credible sources in different formats (e.g., digital, print) using correct format. | Cites credible sources using correct format. | Cites sources. | Does not cite sources. |
| Presentation shows thought and effort. | Presentation is engaging, informative, and creative. | Presentation is informative and creative. | Presentation is informative. | Presentation contains many errors and is not informative. |

Differentiation and Extended Learning Activities

HANDS ON WINTER

Have students participate in these hands-on activities to experience some of the challenges animals face in winter. After each activity, have students discuss their experiences in groups or as a class.

FROZEN FOOD:

Materials: Ice trays, water, pineapple chunks or maraschino cherries

Fill ice trays with water and add a small piece of pineapple or a maraschino cherry to each cube. Freeze the ice cubes and distribute one to each student. Challenge students to eat the fruit. Discuss how this represents a challenge animals face in winter. What did students experience?

ANIMAL ENERGY:

Materials: Stopwatches, paper, and pencils

Have each student count his or her pulse for one minute as he or she sits quietly and then record the number. Then, have them each run in place or do jumping jacks for one minute and record his or her pulse again. Have students sit quietly and observe the changes as their pulses slow to their resting rates. Where does the energy they used come from? How does this relate to animals in winter?

IT'S GETTING COLD!

Materials: Bowls, warm water, ice cubes, thermometers

Provide groups of students with a bowl half-filled with warm water, some ice cubes, and a thermometer. Have each group measure and record the initial temperature of their water. Then, have each group add one ice cube at a time, stirring until it melts, and record the temperature after each ice cube is added until the water reaches 43 degrees Fahrenheit, the body temperature of a hibernating animal. Have students put their hands in the water. How does it feel? Could they sleep at this temperature? What do they think would happen to their bodies?

INSULATION STATION

Materials: Plastic sandwich bags, vegetable shortening, buckets, ice water

Provide groups of students with two plastic sandwich bags, some vegetable shortening, and a bucket of ice water. Have each group put some vegetable shortening in one bag, then turn the second bag inside out before placing it into the first bag, sealing the bags to each other and forming a sort of shortening-insulated glove. Have each group of students place their bare hands into their bucket of ice water and discuss how the water feels. Then, have them put their hands in their insulated bags and place them in the water. Discuss any differences.

WINTER MATH

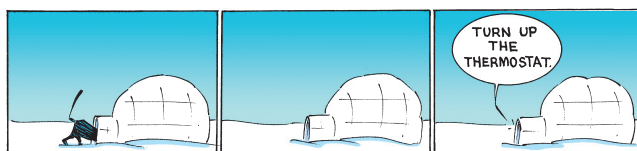
Have students gather numerical statistics about animals in winter. Examples:

- * Distances specific species of animals migrate
- * Numbers of individual animals that migrate in each species
- * Lengths of time different animals hibernate
- * Amount of weight hibernating animals gain and lose
- * Estimates of an animal's regular and hibernating heartbeat and respiration rate

Have students create charts, graphs, and other data displays to show this information. Then, have them create math problems or questions to pose to other students about their data displays.

WHAT WOULD YOU DO

Ask students: Would you prefer to hibernate, migrate, or stay active and adapt to winter weather? What would be the advantages and disadvantages of each? Have students write imaginative stories about their own adaptations to winter weather.

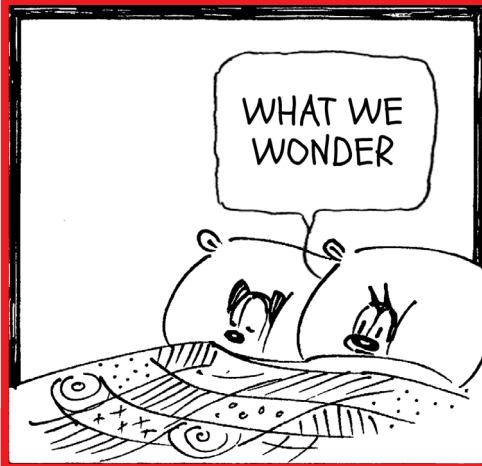


NAME(S) _____

DATE _____

KWL: ANIMALS IN WINTER WEATHER

Directions: In the first column, write what you know about how animals adapt to winter weather. In the second column, write what you wonder about how animals adapt to winter weather. You will complete the third column later.



Blank space for writing in the 'WHAT WE KNOW' column.

Blank space for writing in the 'WHAT WE WONDER' column.

Blank space for writing in the 'WHAT WE LEARNED' column.

ANIMAL ADAPTATIONS: HIBERNATE, MIGRATE, OR ADAPT

How do animals change their bodies or behaviors to survive in winter weather? They **hibernate**, **migrate**, or stay active and **adapt**.

Migrate

Some animals deal with winter weather by leaving places where it is cold and moving to warmer areas. This is called *migration*.

- * Many birds, such as songbirds, geese, and even hummingbirds, migrate hundreds or thousands of miles each year, moving south to warmer places for the winter.
- * Caribou migrate in massive herds from the Arctic coast, where they spend the summer, to the relatively warmer mountains to the south for winter.
- * Gray whales migrate up and down the west coast of North America, spending the summer in the Arctic and the winter in Mexico.

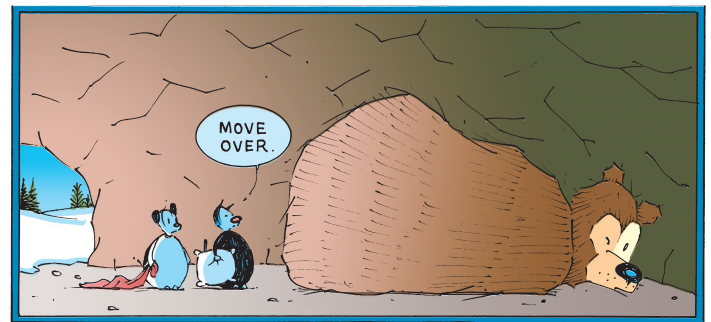


Hibernate

Some animals go into a deep sleep for most of the winter to avoid cold weather. This is called *hibernation*. While an animal hibernates in a cave or burrow, its body temperature and heart rate drop and its breathing slows to conserve energy.

- * Bears are true hibernators—they can sleep up to seven months without eating or drinking. They eat massive amounts of food during the summer and fall to save up fat, which their bodies use for energy during hibernation.
- * Some bats hibernate. Their heart rates drop from about 400 beats a minute to just 25, and their breathing slows so much that they each might take a breath only once an hour.

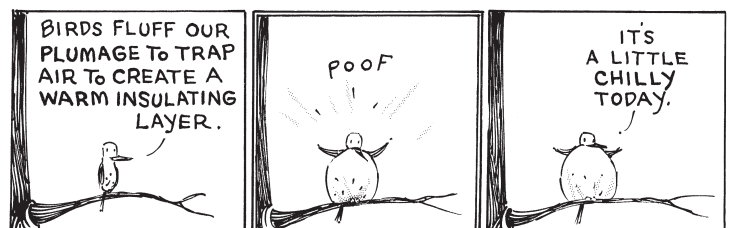
- * Some mammals, such as skunks and chipmunks, gather food and keep it in their burrows. Then, they huddle together to share body heat and go into *torpor*, a light form of hibernation, waking every few weeks to eat.



Adapt

Some animals change their bodies or behaviors to stay active and survive in winter weather. This is called *adaptation*.

- * Arctic foxes and hares have coats that turn white in winter, giving them camouflage in the snow.
- * Deer grow thicker coats with hollow hairs that insulate them and keep them warm in winter.
- * Some small mice and voles create tunnels under the snow so they can forage for food while avoiding predators.
- * Predators like foxes have very sensitive hearing. They can track a mouse under the snow without seeing it, and then pounce, diving through the snow after their prey.



NAME(S) _____

DATE _____

WINTER ANIMAL PRESENTATION

For your research project, you will choose one specific animal that migrates, hibernates, or adapts. Then, you will create a presentation to share with the class showing what you learned. Your presentation should include interesting information about the animal and how it fulfills its survival needs in winter.

Research tips:

ANIMALS THAT MIGRATE: Search for details such as why the animal migrates; where and how far it migrates; how it is able to travel so far; and what dangers it faces along the way.

ANIMALS THAT HIBERNATE: Look for information such as where the animal lives and hibernates; how it prepares for hibernation; and what happens to its body while it hibernates.

ANIMALS THAT STAY ACTIVE AND ADAPT: Find out what winter weather is like where the animal lives; how its body or behaviors changes in winter; and how these changes help it to survive.

Your presentation can be in any format that you like—a poster, a comic, a blog post, a video, or another project of your choice. Your project should meet these requirements:

1. Your presentation must include written facts about the animal's survival skills.
2. Your presentation must include drawings, photographs, maps, or other visual displays.
3. You must provide a list of the sources you used in your research.

My animal: _____

My presentation format: _____

Facts about my animal in winter: