



TEACHING GUIDE

ABOUT THE BOOK

As day breaks, a young boy and his dog venture down a scenic, winding valley trail. On a distant hill, they encounter a beautiful tree and observe it from trunk to branch to twig. They finally spot a white bird sitting on her nest. When a chick hatches from the egg, stretching each leg, the baby bird turns to observe the boy. *On Bird Hill* is loosely fashioned after the children's song "The Green Grass Grew All Around" by William Jerome and Harry Von Tilzer, published in 1912.

USING THIS EDUCATOR'S GUIDE

This guide features activities that target national education standards for a variety of subjects for grades K-2. Each activity lists which standards it meets:

- Science (SCI; Next Generation Science Standards)
- English Language Arts (ELA; Common Core State Standards)
- Math (MATH; Common Core State Standards)
- Art (ART; National Core Art Standards)

Science Connections (SCI)

- NGSS Disciplinary Core Ideas, Life Science and Earth Space Science: LS1.B; LS1.C, ESS3.A

Math Connections (MATH)

- CCSS Mathematical Practice, Measurement and Data: K.MD.A2, 1.MD.C4, 2.MD.A1, 2.MD.D10

Art Connections (ART)

- Theater: TH:Cr1.1, TH:Cr2.1, TH:Pr6.1
- Visual Arts: VA:Cr1.1, VA:Cr1.2, VA:Cr2.1, VA:Cr2.3, VA:Cr3.1, VA:Cr4.1, VA:Re7.2

English Language Arts Connections (ELA)

- CCSS English Language Arts:
Reading Literature: RLK.1, RLK.2, RLK.3, RLK.7, RLK.10; RL1.1, RL1.2, RL1.3, RL1.7; RL2.1, RL2.5, RL2.7
Writing: W.K.1, W.K.3, W.K.8; W.1.2, W.1.3; W.2.2, W.2.3
Speaking and Listening: SLK.1, SLK.2, SLK.4; SL1.1, SL1.2, SL1.4; SL2.1, SL2.2, SL2.4
- Reading Processing Strategies: Predicting, Making Connections, Inferring, Analyzing

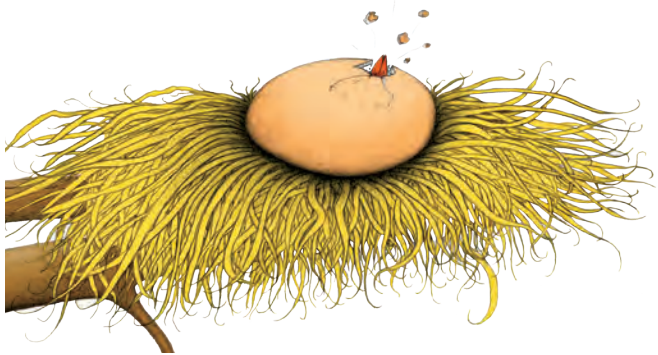
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DISCUSSION QUESTIONS



BEFORE READING

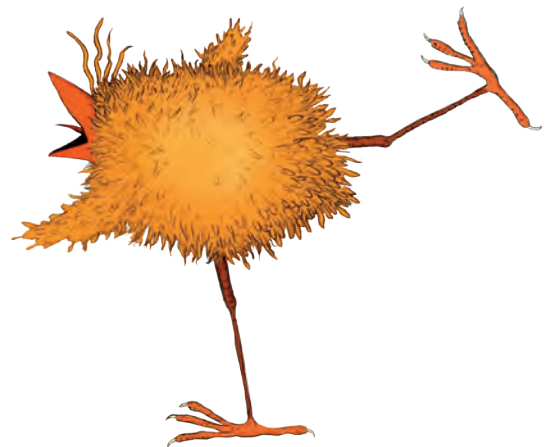
Show the book cover and title, and ask:

- What do you think this book is about? (Brainstorm some ideas, and then find out if they match up to what happens.)
- What do you think might happen to the egg during the story?
- Have you ever seen anything surprising on an outdoor walk? How did the surprise make you feel?

AFTER READING

After reading, ask:

- How did our predictions match up to what happened in the book?
- Do you think that Bird Hill is a real place? (Invite children to take another look at the illustrations in the book and compare them to places they know about in real life.)
- What type of environment makes a good bird habitat (home)? (Plenty of the right kinds of food, water, shelter and space for the bird species.)

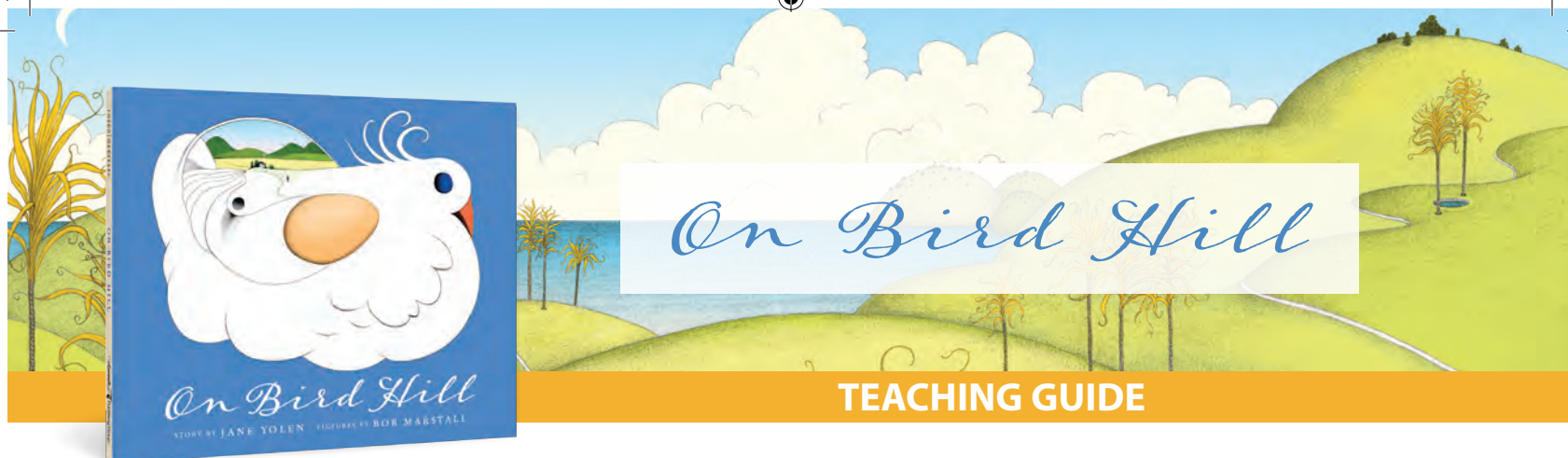


ACTIVITIES

- 1 Retellings and Reenactments** (SCI, ELA, ART) - Involve children in a reenactment of the story of the events of *On Bird Hill*. Use pantomime as a way to retell the story without using words. Have children use hand gestures, facial expressions, and body movements to convey the action of the story. You might supplement with a variety of props, including sticks, rocks, toy eggs, and any other materials for the children to use in their reenactment. For practice, have the children form a circle and encourage them to act out the hatching of the egg. Ask the children whether they think it is challenging for a baby chick to crack the egg and escape. Show a video of an egg hatching. Have students reenact the hatching again, keeping in mind the details they recall from a real hatching.



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2 Sequential Storytelling (SCI, MATH, ELA, ART) - Explain the importance of telling a story with a beginning, middle, and end, and revisit what happened at each stage of *On Bird Hill*. Use a storyboard to create a numbered sequence of events, picking out the most important parts of the story. Then, have children take their turn at creating a fictional story about a bird through writing, drawing, or dictating. Afterward, have children read or explain their events in order to the group, emphasizing various transition words (for example: first, then, next, lastly). If time remains, ask small groups to work together to act out the stories.

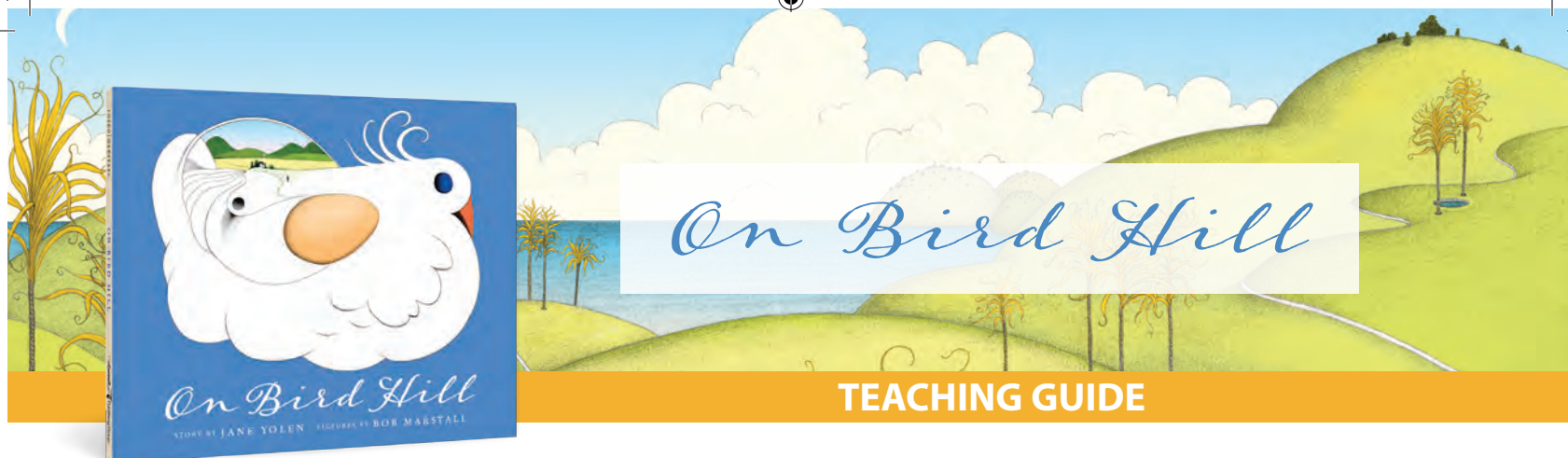
3 Baby Bird Run! (SCI, MATH) - Establish opposite sides of a large outdoor space or gym/classroom as "true" and "false." Read the statements below and ask children to move to the side corresponding to what they think is the correct answer. After everyone moves, read the answers to the group and discuss. Note the number of correct answers for each question for a graphing extension and to address any common misconceptions.

- All birds build nests. (False. Most do, but some don't. For example, Brown-headed Cowbirds lay their eggs in the nests of other birds.)
- Some birds give birth to live babies rather than lay eggs. (False. All species of birds lay eggs.)
- Eggs and chicks are not always safe in their nest. (True. Birds such as Blue Jays and crows, and other predators such as chipmunks, raccoons, and snakes will eat them if they find them!)

- Most birds live in their nests year round. (False. Nests are used for laying eggs and raising young.)
- Only the female (mother bird) sits on the eggs. (False. It depends on the species. Sometimes the father birds help a lot!)
- Most baby birds are fed only seeds and berries by their parents. (False. Just like growing kids, baby birds need lots of protein! Many songbirds are fed insects by their parents. Birds of prey, such as hawks and herons, feed their nestlings meat.)
- Birds can breathe inside their eggs before they hatch. (True. Eggshells have tiny holes all over them. They are porous enough for gases like carbon dioxide and oxygen to pass through.)
- If you find a baby bird you should feed it bread and milk. (False. Birds cannot digest milk and bread. If you find a nestling put it back in the nest, and if you find a fledgling leave it alone if it is not in immediate danger! It is just practicing being out of the nest.)



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Share the number of correct answers for each question and use the results to create a bar graph. Use the graph to determine which statements were the easiest and which were the most challenging.

4 Habitat Designers (SCI, ELA, ART) - Refer to the images of the setting in *On Bird Hill*. Ask:

- How is this setting like real life? (There are trees, water, green grass, clouds, the moon, and many animals in the setting.)
- How is it different? (Children might notice that the habitat is pretty sparse and certain objects, such as the trees and leaves are not realistic.)
- What do you think this setting would need to provide for a growing baby bird? (Children should mention aspects of food, water, and shelter.)

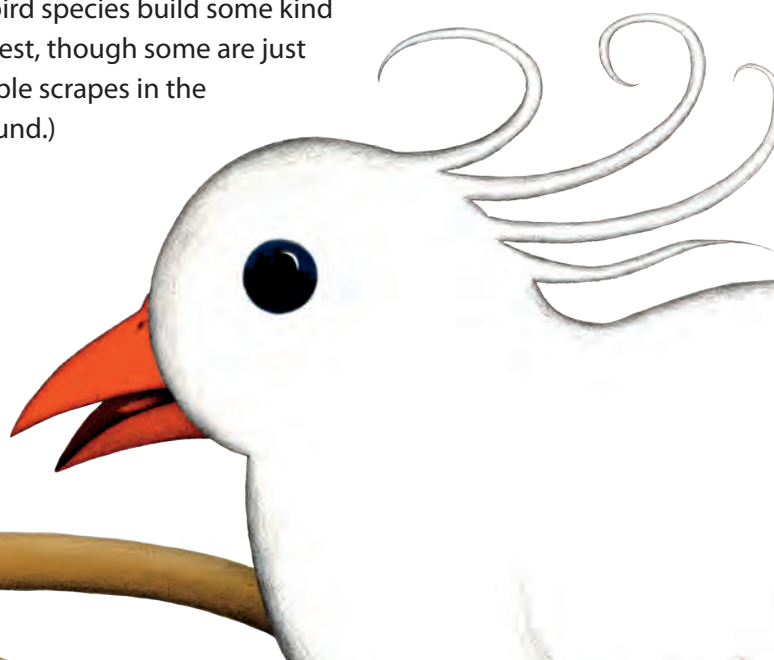
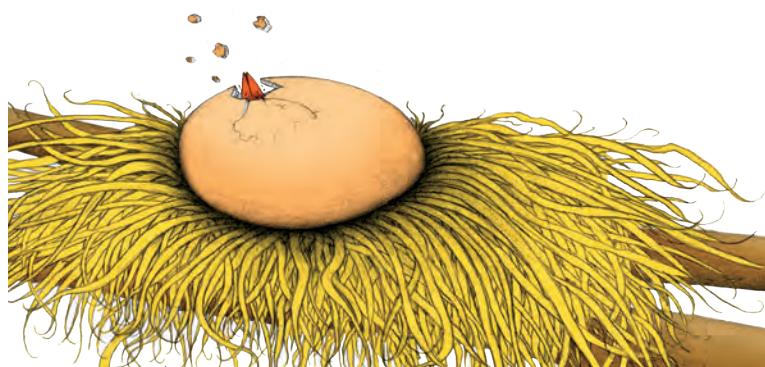
Provide groups of 2-4 children with a large piece of poster or construction paper and invite them to draw a realistic bird habitat. Encourage scientific thinking by asking questions such as:

- What type of environment are you creating?
- What species of birds might live there? What other animals might live there?

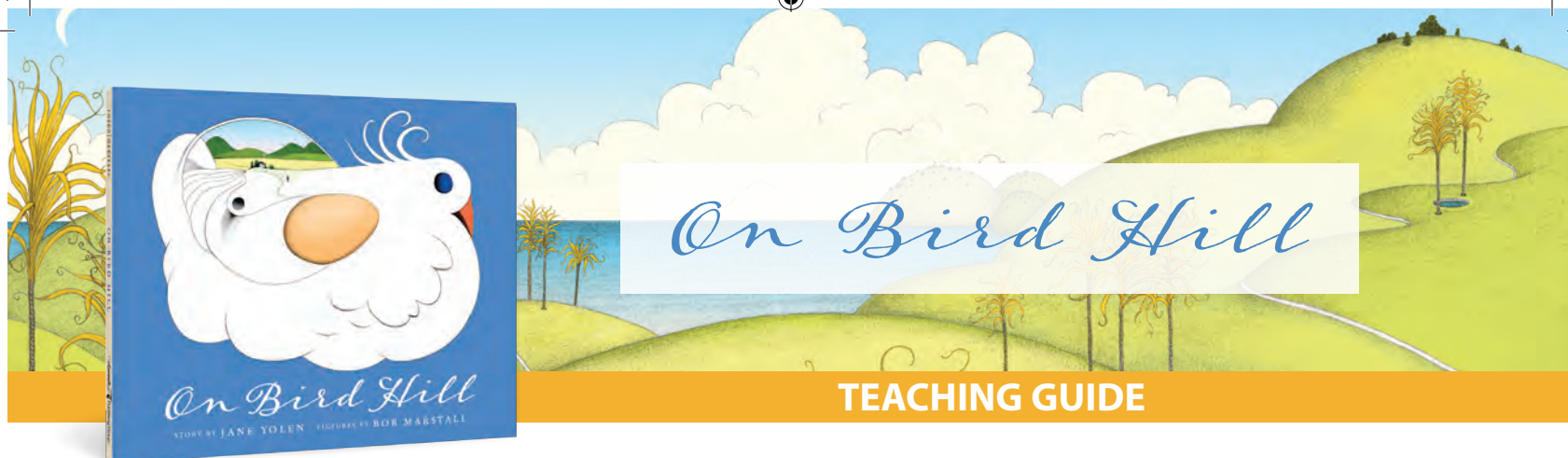
- Does the habitat you've created provide the bird with food, water, and shelter? If not, what can you add to make this a better habitat? Encourage older students to label the sources of food, water, and shelter in their diagrams.

5 So Many Nests (SCI) - Birds provide warmth and protection while their embryos develop inside their eggs, and once the eggs hatch, the young need a place to mature and be safe until they can care for themselves. A nest is a place where parents incubate and care for eggs and young, rather than a year-round "home" for birds (you might liken the nest to a crib or nursery). Ask children:

- Why do you think birds build nests? (To hold their eggs and young.)
- Have you seen a nest before? Where was it? What was it made out of? (Answers will vary, but likely will include nests made of sticks, mud, grass placed in trees, on buildings, or in nest boxes.)
- Do all birds build nests? (Almost all bird species build some kind of nest, though some are just simple scrapes in the ground.)



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- When do birds build their nests? (Birds in North America generally build their nests in spring and raise their young during spring and into summer.)

Share images of different types of bird nests and have the children describe each nest and guess what kind of bird made them. (For example, compare the nests of a hummingbird and a Bald Eagle. Several hummingbird species build nests that are only an inch in diameter, or about the size of a nickel. Bald Eagles, on the other hand, make enormous nests the size of minivans—the largest recorded nest was measured 9 feet wide and 20 feet tall!) Chat about the similarities and differences in nests, creating a Venn diagram if desired.

Together, make a list of locations where nests are found (in trees, under the eaves of buildings, on the ground, in nest cavities and nest boxes, etc.) as well as a list of nesting materials (sticks, small twigs, mud, grass, spider webs, etc.). When both lists are complete, emphasize the great diversity of nests and the fact that birds nest in many locations on land, both in natural and man-made structures, and that nests are like a crib or a nursery for bird young, rather than their permanent home.

- 6 Build a Nest** (ART, SCI) - Revisit one of the pages of *On Bird Hill* that contains an image of the bird's nest, and take a closer look. Ask:

- What does the nest look like?
- What is it made from?

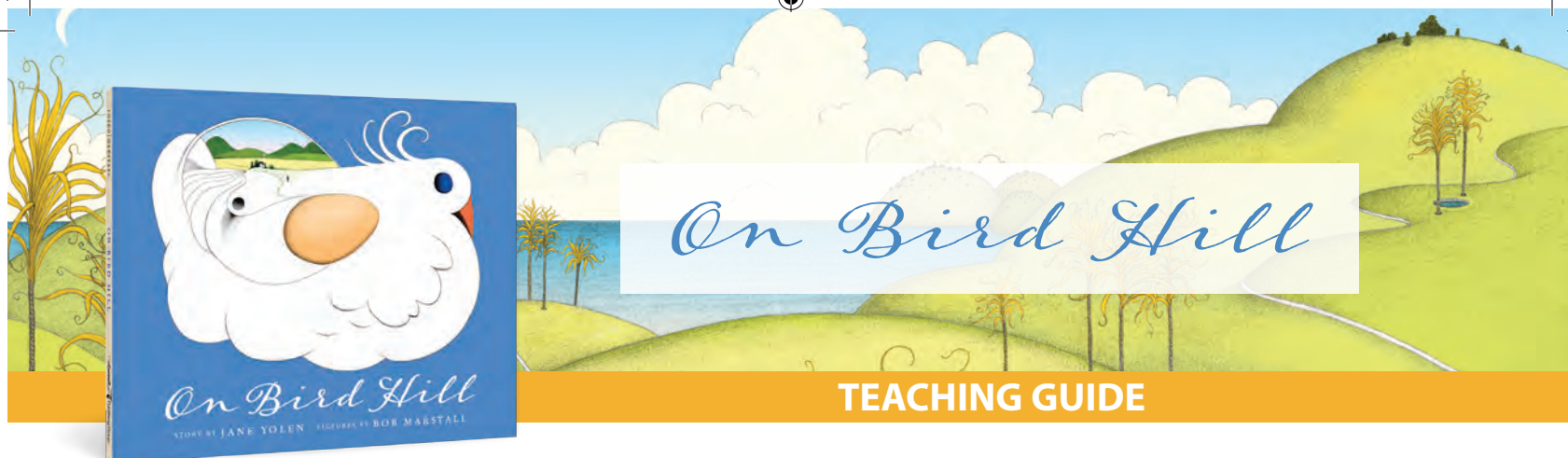
Have children build their own "nests" by using materials from outside or that you provide. Some ideas include natural objects such as sticks, grass, twigs, leaves, pinecones, or even popsicle sticks, pipe cleaners, and string. Ask children to think about the different ways in which nests can be made:

- Are they woven or knotted?
- Are they held together by a sticky substance, like mud or spider webs?
- What's the benefit of using one method over another?

Explain that birds design nests in different ways and for different environments, so there really is no "wrong" way to build a nest. When all the crafts are complete, test each nest's ability to hold "eggs" by placing a handful of small rocks inside and setting it on a tree branch or other prop. Do the nests pass the sturdiness test? If not, maybe they are designed for ground-nesting birds!



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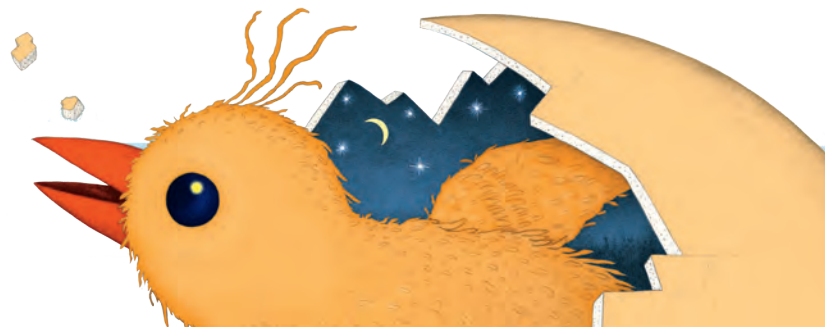
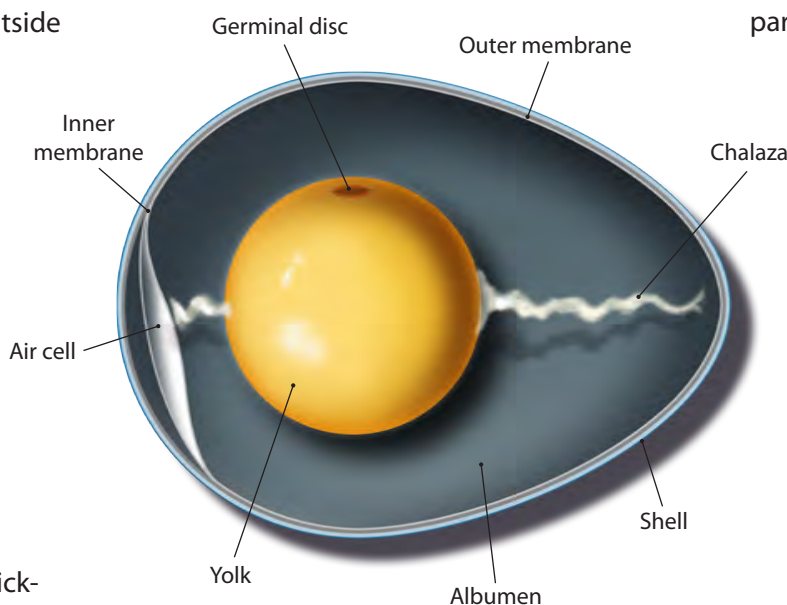
7 Camouflage and Seek (ART, SCI) - Introduce children to the concept of camouflage, explaining that both birds and their eggs use it to stay hidden from predators. Show pictures of animals that excel at staying hidden. Have students play a game of "camouflage and seek." Take them outside and encourage them to find a spot where their clothing blends into the surroundings. Have one or two children try to spot their friends from a central location. Ask:

- Can we find everyone?
- What colors are the trickiest to see? Why?
- Are there any kids that aren't as successful at camouflaging themselves? Why do you think they have trouble hiding?

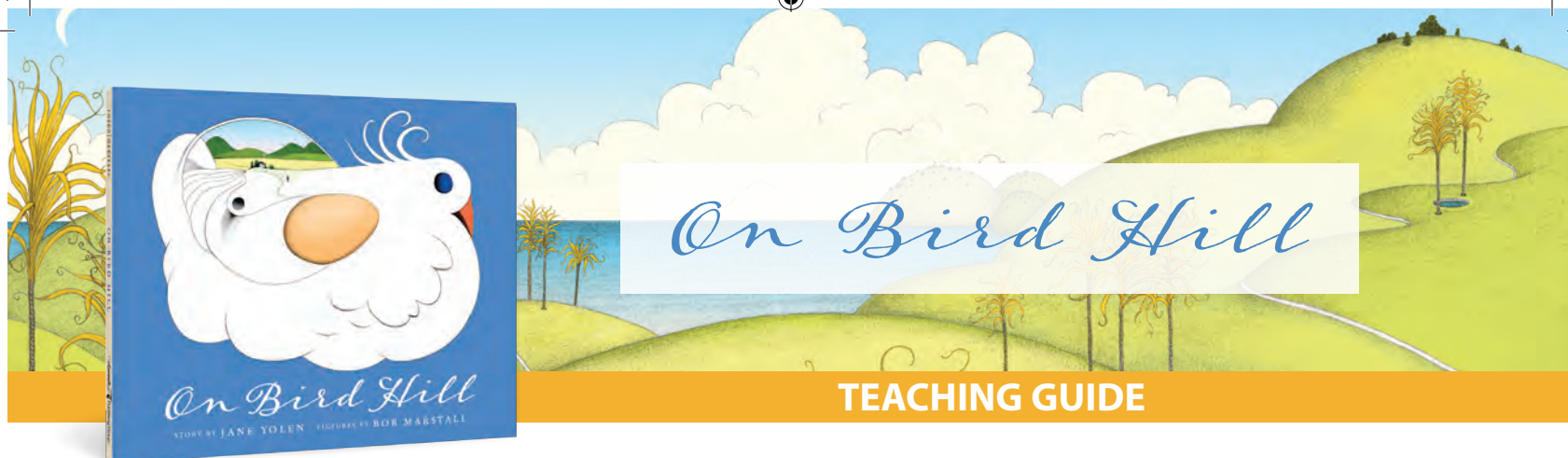
Using what you learn about colors and patterns, challenge children to design their own eggs, either on paper or by painting foam or plastic eggs. Share all the creations, brainstorming the best places that particular eggs could be hidden. If time allows, play another round of "camouflage and seek"—this time with the eggs—to see how well the designs blend in.

8 Egg-sploration! (ART, SCI) - Provide each group or child with one bowl and at least one egg per child. (Be sure to cover safety and sanitation while handling eggs; be sure that everyone washes their hands thoroughly before and after the activity.) Invite children to examine the different parts of the egg, from the shell to the yolk. First, show the pages in the book in which the chick pops out of the egg, revealing the porous eggshell and the world within the egg. Have children gently pick up their egg and take a close look at the outer shell. Ask:

- What color is the shell?
- What does the shell feel like? Is it rough or smooth?
- How would you describe the shape of the egg?
- Are all of our eggs the same size and color? (If possible, use rulers to measure the length, height, and circumference of the eggs.)



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- When we crack the egg, how do you think the inside of the shell will look? Do you think it will look anything like the inside of the egg in the book?

Next, show children how to gently crack open the eggs, being careful not to break up the yolk, and keeping the shell as intact as possible. Use this as an opportunity to explain that the yolk is not a baby bird, but in fact just food (and a good source of vitamins and minerals!). After eggs are cracked, look at the inside of the shell. Ask:

- Does the shell look and feel the same as the outside? What is similar/different?
- What color is it?
- What do you notice about the inner shell? (Be sure to point out the air sac created by the membrane that lines the egg.)

Then have children look at the inner egg. Ask:

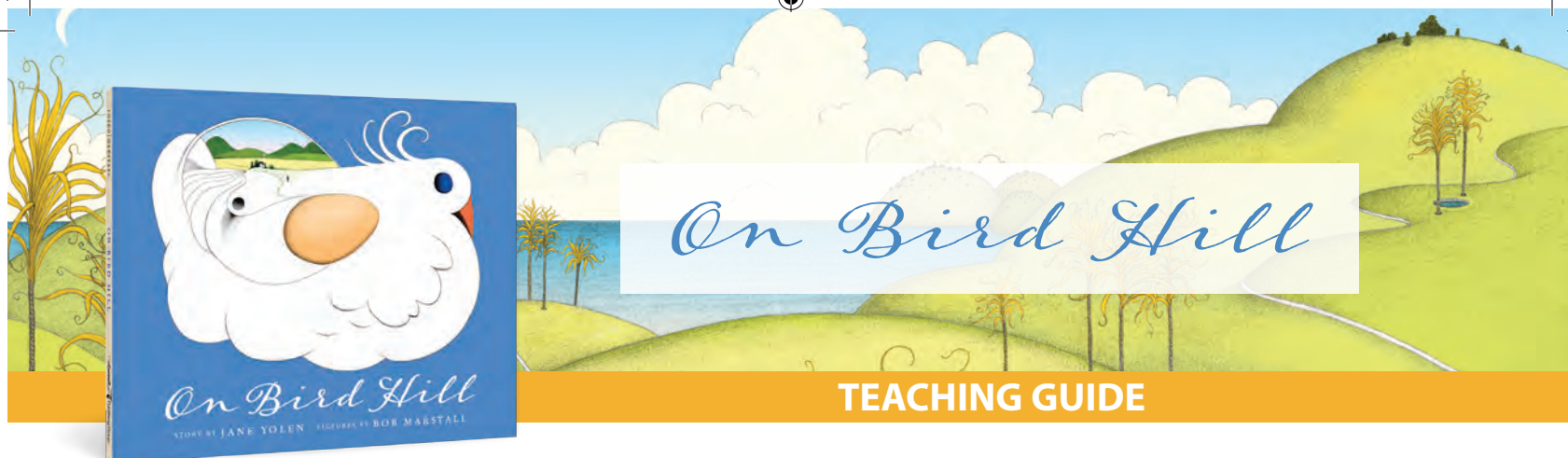
- What is the texture of the egg white, or albumen?
- What color is the yolk? What shape is it?
- What other features do you notice? (Children may notice the chalaza—the white stringy part that anchors the yolk in place, the “thin” and “thick” albumen—the thick albumen is closer to the yolk, or the germinal disc—a small light spot or depression on the egg yolk where the mother bird’s genetic material is located.)

Invite children to break the yolk and carefully observe what happens. As an extension, rinse and dry the leftover shells and use them for a painting activity: Invite children to paint the inside of the shell to creatively make a “world” inside the egg, such as the one illustrated in the book.

Bouncing Baby Bird (SCI, MATH) - Eggshells protect the embryo (soon-to-be baby bird) growing inside them. Explore a “shell-less” egg by placing several raw eggs in a bowl of white vinegar. Note that bubbles will begin to form on the surface. Leave the eggs to soak, covered and refrigerated if possible, for two or three days. Take the eggs out, rinse them, and let students very gently handle the eggs. Ask:

- Where did the eggshell go? (Basically, it dissolved into the vinegar and went into the air! When a raw chicken egg is placed in a glass of vinegar, a reaction takes place that dissolves the eggshell. Vinegar contains acetic acid, which breaks apart the calcium carbonate in the eggshell into its calcium and carbonate parts. The calcium ions go into the vinegar, while the carbonate creates the carbon dioxide bubbles that you see.)
- What do you predict will happen if we drop the egg? (Test theories by using a ruler and dropping the egg into a sink or into a very large flat bowl from a height starting at one inch. Continue dropping the egg from slightly increasing heights until it splats!)
- Why do you think the egg bounced? (Once the hard shell is gone, the egg, covered only by the softer internal membrane will bounce like a balloon.)

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10 Comparing Critters (ART, SCI) - Give children the opportunity to create their own bird by supplying them with a variety of materials (i.e. feathers, tissue paper, ribbon, yarn, cotton balls, paper plates). Before you begin, you may want to show pictures of real birds that are common in your area and give them the option of re-creating a species or designing their own. Compare and contrast the birds they have created with each other's birds or to the pictures of real birds. Do they notice any similarities between color, shape, beaks, wings, or size? You may also wish to review the characteristics that all birds have in common: they are vertebrate animals that have feathers, lay eggs, are warm-blooded, and have wings (though not all of them fly).

11 See a Baby Chick Hatch (SCI) - Study the life cycle of a bird up close! View streaming or archived nest camera videos to take an inside look at the life of a bird from egg to chick and eventually to adult. Alternately, you can order chicken eggs from a local hatchery and use an incubator to hatch baby chicks. Whether you're looking at nestcams or real birds, observe and record the different stages of the chicks' lives.

12 Changing Chicks (ART, SCI) - Revisit *On Bird Hill* to point out the differences between the parent and baby bird. Ask children:

- What makes the baby and adult birds similar? (Their beaks, the plumage on their heads, and their shapes are similar.)

- Can you tell that they are related? If so, how? (They have a number of shared characteristics.)
- In what ways are the two birds different? (Some differences include size, color, tail length.)

Then, print out separate pictures of different types of birds and their chicks such as Blue Jays, American Robins, Canada Geese). Have children match real baby birds to their parents, paying attention to telltale characteristics such as beak or body shape. When all the matches are made, have children explain their reasoning for pairing certain birds.

Afterward, provide everyone with a blank piece of paper folded into a triptych and have children draw their own versions of the stages in a bird's life! Give kids the option of choosing any bird they'd like, or allow them to create an imaginary bird. In the first column, draw the first phase of the bird's life cycle: the egg. In the second, illustrate the chick once it's hatched, and in the last, draw the bird as it appears as an adult. Then, go around the room and compare each child's drawings. Does the baby bird look like its parent in every case?

The **Cornell Lab** of Ornithology
BirdSleuth K-12

A special thanks to Kristie Miner and Bob Marstall for their contributions to this guide.



For additional activities, including free lesson plans, Book Activity Guides, and professional development opportunities, please visit the Cornell Lab's educational program, BirdSleuth, at www.birdsleuth.org. Specific images and videos mentioned in this Guide can be found at www.birdsleuth.org/OBHbook.