

Problem Solvers Activity 20: Nature Patterns

CHILDREN ARE LEARNING TO...¹

- Recognize a simple pattern.
- Duplicate and extend AB patterns.

MATERIALS NEEDED:

4 glue sticks

Transparent tape

4 colors of construction paper – 2 sheets each

Index cards or cardboard

15 Popsicle sticks or unsharpened pencils

4 plastic bowls or containers

Real feathers (optional, can be found at craft stores)

Handout 1: Bird Cards

Handout 2: Feathers

Handout 3: Feather Top Template

Handout 4: Feather Bottom Template

Handout 5: Animal Cards

PREPARATION:

- Review **Background Information on Teaching Patterns** found in Activity 13.
- To hear the calls of the black-capped chickadee, the great horned owl, and the blue jay, visit The Cornell Lab's allaboutbirds.org site or search online using the name of the bird and "bird calls." You may wish to share these recordings with the children. *Note that song descriptions have been simplified for the purposes of this activity.*
- Print copies of **Handout 1**, one for each child and one for the teacher. Use these to make simple stick puppets by cutting the bird cards apart and gluing each to an index card or cardboard to make it sturdy. (You may want to laminate the cards for further use.) Glue a popsicle stick or unsharpened pencil to the back of each card to make it easier to hold.
- Print 2 copies of **Handout 2** in color. Cut out each feather. You will have 6 feathers.
- Print **Handout 3**, one per child plus one for teacher.
- Print **Handout 4**, one per child plus one for teacher.

¹ Head Start Early Learning Outcomes Framework: Ages Birth to Five. <https://eclkc.ohs.acf.hhs.gov/interactive-head-start-early-learning-outcomes-framework-ages-birth-five>

- Make large feather templates by taping the **Handouts 3** and **4** together forming one large feather. You should have 5 large feathers (1 for each child and 1 for the teacher demonstration).
- Make paper strips for the **EXPLORE** activity. From the construction paper, cut strips that are about 4 inches wide and about 1.5 inches high (they should fit across **Handout 3: Feather Template**). Cut 20 strips each in 4 colors (80 strips altogether). Place each color paper strips into a separate container.
- Plan a route for a pretend hike through the classroom. Place six paper feathers (from **Handout 2**) along this route, face up on the floor where they can easily be seen by children.
- Prepare copies of the parent handout for distribution.
- **Photocopy Handout 5 only** if you plan on implementing the optional book activity. Refer to the preparation instructions in that section for more information.

Activity Instructions

ENGAGE

Gather a group of 4 children in the space used for circle time.

SAY: How many of you have ever taken a walk in the woods or in a park? What did you see there? What did you *hear* there?

SAY: Today we are going to take a pretend walk in the woods to go bird-watching. We will see if we can spot any signs of birds. What do you know about birds?

Explore children's understandings of birds. Use the sidebar facts to supplement their knowledge if you wish.

SAY: Let's get ready for our pretend hike. Let's put on our pretend boots in case it's muddy. [Pretend to pull on boots.] What else should we wear? What should we bring with us?

Model pretend play like putting on a jacket or hat. Suggest that *binoculars* might be useful to spot birds far away. This is probably a new word for many children so explain ("they're a tool we can look through to see things far away") and model holding a pair of binoculars up to your eyes.

SAY: Sometimes when we take a walk in the woods, we can figure out what birds have been there by looking at the feathers they leave behind. As we take our walk, I want all of our Problem Solvers to be looking for feathers that may be on our path. Are you ready? Let's go!

Lead children on a winding path to the first feather. If no one spots it, point it out.

SAY: My friends! I spy a feather. I wonder what bird left this here? What color bird do you think the feather came from?

Invite a volunteer to hold the feather. Continue until all feathers have been found and each child is holding one.

Once children are seated, ask them to place the feathers on the table in front of them so that everyone can see.

BIRD FACTS FOR TEACHERS

1. Birds are the only animals with feathers. Some are brightly colored to attract a mate. Some birds have feathers that help them blend in with the place they live (camouflage).
2. Birds use their songs to communicate—to greet others, warn of danger, or call a mate.
3. Birds' beaks and feet give clues to the kinds of foods they eat. Black-capped chickadees' small beaks are perfect for their diet of seeds. Great horned owls have sharp beaks and talons for gripping and eating their prey (small animals like rabbits, mice, and squirrels.)
4. Black-capped chickadees can hide their food to eat later and can remember many hiding places.

EXPAND

SAY: What do you notice about these feathers? Do you see any patterns on these feathers? Are there any feathers that look like they might have come from the same kind of bird?

Engage children in a description of the patterns they see.

Ask children to sort the feathers that look the same. Point out that they have collected feathers from three different kinds of birds.

- Blue jay feather—blue/black stripes on one side
- Great horned owl feather—brown/black stripes all the way across
- Chickadee feather—note that this feather does NOT have a repeating pattern. It's mostly gray.

SAY: These are pictures of feathers. Real feathers are much softer. [Show real feathers if you have them.] Birds are covered with feathers, just like you're covered with hair and skin, and dogs and cats are covered with fur. Sometimes birds lose their feathers and new ones will grow. If you find a feather, you know that a bird was nearby. And you can sometimes tell what kind of bird was near looking at the feather.

ASK: I wonder what we can guess about the birds these feathers came from. [Choose the largest feather.] Do you think this feather came from a big bird or a small bird? [Encourage children's predictions.] How about this one? [Choose the smallest feather.] That's right—the size of the feather tells us something about the size of the bird it came from.

SAY: We have three kinds of birds here: a blue jay, a black-capped chickadee, and a great horned owl. [Show children the puppet version of each of these birds as you introduce it.]

ASK: Problem Solvers, let's see if we can use our observation skills to figure out which birds these feathers came from. Let's look at these blue/black feathers. Can you guess which bird they came from? Right, the blue jay! What clues did you see? How did you know?

Continue with the brown/black feathers (great horned owl) and the gray feathers (black capped chickadee).

Summarize by noting that some birds have feathers with patterns and others don't. We can often figure out what kind of bird was there by examining the feathers they left behind.

SAY: When we talked about what you knew about birds, you all mentioned birds could fly. But birds can do something else that's special too. They can make different sounds! (If children did mention this earlier, be sure to say so.)

ASK: Did you know different birds make different sounds? Who knows what a duck says? (Quack Quack) Who knows what a hen or a chicken says? (Cluck Cluck) If you go for a walk and are very, very quiet, you might hear birds singing. Birds sing to tell other birds that they're nearby, or to warn of danger.

SAY: Here's what a chickadee sounds like [Make the sound using a high tone followed by a low tone.]: *Dee-dee. Dee-dee. Dee-dee.* Try it with me. *Dee-dee. Dee-dee. Dee-dee.* What's the first sound you hear? What's the second sound you hear? Let's see if we can all make the sounds of a chickadee.

Distribute one chickadee puppet to each child.

SAY: When I say "Ready, tweet", you will move your puppets this way (move the puppet up) when we say "Dee" (high tone) and then this way (move puppet down) when we say "Dee" (low tone). Let's try it!

SAY: Ready? Tweet.

Lead the children in a chorus of dee-dee, dee-dee, dee-dee, moving the chickadee puppet up for the first part of the pattern and down for the second part. Repeat the pattern three times.

Ask if any children would like to demonstrate the pattern independently.

ASK: Problem Solvers, do you think great horned owls make the same sound pattern as a chickadee? No, they sing a very different song than the chickadee.

SAY: Here's what they sound like [Make the sound using three long hoo's, followed by two short hoo's.]: *Hoo-hoo-hoo. Hoo-hoo. / Hoo-hoo-hoo. Hoo-hoo. / Hoo-hoo-hoo. Hoo-hoo.*

SAY: This pattern has two parts. Listen to the first part: **hoo-hoo-hoo** (long hoo's). How many hoo's do you hear? Listen to the second part: **hoo-hoo** (short hoo's). How many hoo's do you hear? Let's put them together.

Distribute the owl puppets to children.

Invite children to join you repeat the pattern with their puppets. This time, have children "bounce" their puppet up and down for each "hoo." Repeat the pattern three times.

SAY: Sometimes owls call to each other in the forest. Let's have one owl call and another owl answer. [Ask for volunteers.]

Distribute the blue jay puppets to children.

Explain that the blue jay has an unusual song. There is no pattern to a blue jay's song. It sounds more like a screech ("eeeeek"). Invite children to screech like a blue jay with you while they "fly" their blue jay through the air.

Summarize: We learned that all birds have feathers, but only *some* birds have feathers with a pattern. We also learned that *some* birds have songs with a pattern, and some do not.

EXPLORE

SAY: Now you will have a chance to make your own bird feather! This will be your own special bird—a bird no one has ever seen before! I will give you each a feather and you can choose two colors of paper strips. You can use the strips to make a pattern on your feather. Let's try one together.

Take out the feather template prepared earlier and the paper strips.

Demonstrate the activity by talking through the process of selecting colored strips (use 2 colors in an AB pattern). Ask questions as you work like: What color should we use first? What color should we use second? Place the two strips across the feather.

Explain: Now, for this to be a pattern, we need a repeat of these two colors. So far, we have these two colors: _____ and _____. What color might come next? *Repeat the colors aloud if children need help: blue and orange, so blue comes next.*

Provide each child with a glue stick, a feather template, and colored paper strips to create their own patterns. Encourage them to use different colors than you used together to create a new pattern.

Observe children to see how they are able to create/repeat a pattern. If they are having difficulty, step in to provide support by:

- Prompting them to choose two colors
- Repeating the colors they chose aloud: *Blue and then yellow. Blue and yellow. Then we start over. Blue, yellow, blue...What color comes next?*
- Observing the repeat of the pattern they are creating: *I see you are making lines of blue and yellow, blue and yellow.*

Children may want to create a more complex pattern using two colors, like AAB (blue, blue, yellow). Older children may want to create a three-color pattern (ABC) which is fine too.

When children are done, give each child a chance to show the others their bird's feather and describe the pattern they created.

REFLECT

To close the activity, bring the children back together. Use reflective questions - like those below - to prompt children's thinking about these activities. Listen for the pattern language they may use as they respond to these discussion questions.

- Today we talked about birds and explored their feathers and songs. What did you discover about the patterns on bird feathers?
- We learned that birds use their songs to communicate. What birdsong patterns did we hear and make today? What sounds can you listen for the next time you are in the park?
- You made your own patterns for a feather today. Tell me more about how you chose your pattern. How did you choose those colors for your feather? What name would you give your bird?

Individualizing the Activity

MAKE IT MORE CHALLENGING:

- Once sound patterns have been introduced and practiced, assign each child a chickadee *or* an owl puppet. Direct a chorus of bird sounds by pointing to each child and have them make the sound of the puppet they're holding.
- Together as a group, create a sound pattern for a "new" bird.
- Demonstrate a more challenging pattern in the **EXPLORE** activity (ABC or AAB) to see if children can repeat it.

MAKE IT LESS CHALLENGING:

- Skip the great horned owl sound pattern and focus only on the chickadee (A/B) pattern.
- To simplify the feather pattern **EXPLORE** activity, offer only two colors of paper strips. Create the feather pattern as a group so you can coach children in noticing the repeat of the pattern.

MAKING CONNECTIONS ACROSS THE DAY:

- Listen for sound patterns in your school and neighborhood. Is there a crosswalk that plays a certain tune when it's safe to walk? Does the garbage truck make a sound when it backs up? Every community is filled with its own unique sound patterns.
- While outside or on walk, stop for a "quiet moment" when all children try to listen for any sounds they can hear.
- Learn about/take photos of the birds in your community. Notice if these birds have patterns on their feathers. Search online for examples of these bird songs.
- Play recordings of bird songs during snack time or transitions. Encourage children to copy them.
- Bring in collections of items from outdoors—for example, pinecones, acorns, leaves, or seashells. Have children arrange them to make patterns or use them for sorting activities.

Song: *Birdsongs*

The lyrics to the song are below. Be sure to have the prepared Bird Puppets handy. Pass out one to each child and tell them to listen for “their” bird in the song. They can make their bird “sing” and move when they hear it in the song. Prep children that first, they will hear the chickadee, then the great horned owl, then the blue jay. At the end, all the birds dance and sing together!

Dee-Dee
Dee-Dee
Dee-Dee says the chickadee

Hoo, hoo hoo Hoo hoo
Hoo, hoo hoo Hoo hoo
Hoo, hoo hoo Hoo hoo
Says the great horned owl.

Eeeeeek
Eeek, eeek
Eeek, eeek says the big blue jay.

Now, listen to the sounds
Of the birds all around...
They’re singing in the woods together.

Dee-dee; Eeek
Dee-dee; Eeek
Dee-dee; Eeek
Dee-dee; Eeek

Hoo-hoo-hoo; Dee-Dee
Hoo-hoo-hoo; Dee-Dee
Hoo-hoo-hoo; Dee-Dee
Hoo-hoo-hoo; Dee-Dee

Eeek; Hoo-Hoo-Hoo-Hoo
Eeek; Hoo-Hoo-Hoo-Hoo
Eeek; Hoo-Hoo-Hoo-Hoo
Eeek; Hoo-Hoo-Hoo-Hoo-hoo

They’re singing in the woods together.

Making Literacy Connections

Share the following book with children as an opportunity to deepen their understanding of patterns. The literacy extension activity below suggests another play-based experience to invite children to explore patterns.

Suggested Book: *Too Much Noise* by Ann McGovern

Too Much Noise is a cumulative tale. A man complains that his house is too noisy. A wise man suggests that he solve the problem by adding animals to his home, one at a time. When the noise becomes unbearable, the wise man suggests removing each animal, and the man finds that the sounds of his house are actually quite peaceful.

Materials: Flannel board, piece of flannel or roll of hook-and-loop fastener (like Velcro®), and animal cutouts from **Handout 5: Farm Animals**. Cut the animals apart, glue to cardboard (if desired), and add flannel or hook-and-loop fastener to the back of each.

AS YOU READ:

- At the beginning of the story, ask children to repeat the sounds of the tea kettle and the leaves falling on the roof. Is this a noisy house or a quiet house? What do they think? What does the man in the story think? (This type of question helps children begin to understand that different people have different perspectives.)
- Ask children to guess what will happen as each animal is added to the house.
- Ask children chime in on the animal sounds as they are repeated.
- Each time another animal is about to be added, ask children to make a prediction: Do you think the house going to become noisier or quieter?
- Ask children to make connection to their own house: Do they have any animals in their house? What are they? Are they noisy or quiet?
- When the wise man suggests removing animals, ask children to predict whether the house will become noisier or quieter. Do they think the man will be happy or not?
- Ask children what they think: Would they be happier in a noisy house with lots of animals, or not? What makes them think that?

BUILD ON THE BOOK

- Pass out the animals from **Handout 5** for children to hold. Have children add the animals to the flannel board as the wise man directs, then remove them one at a time when he suggests taking them away. Count the animals in the house each time.

Handout 1: Bird Cards



Chickadee



Owl

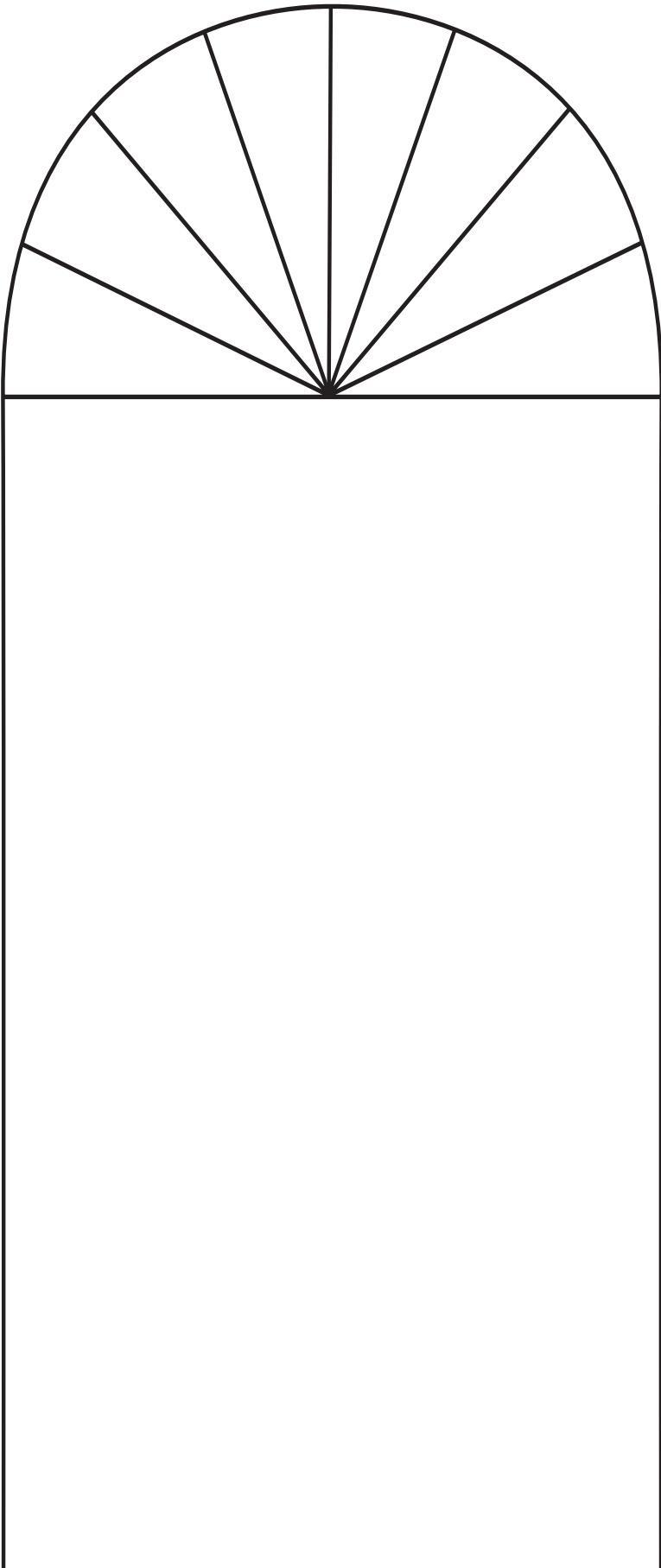


Blue Jay

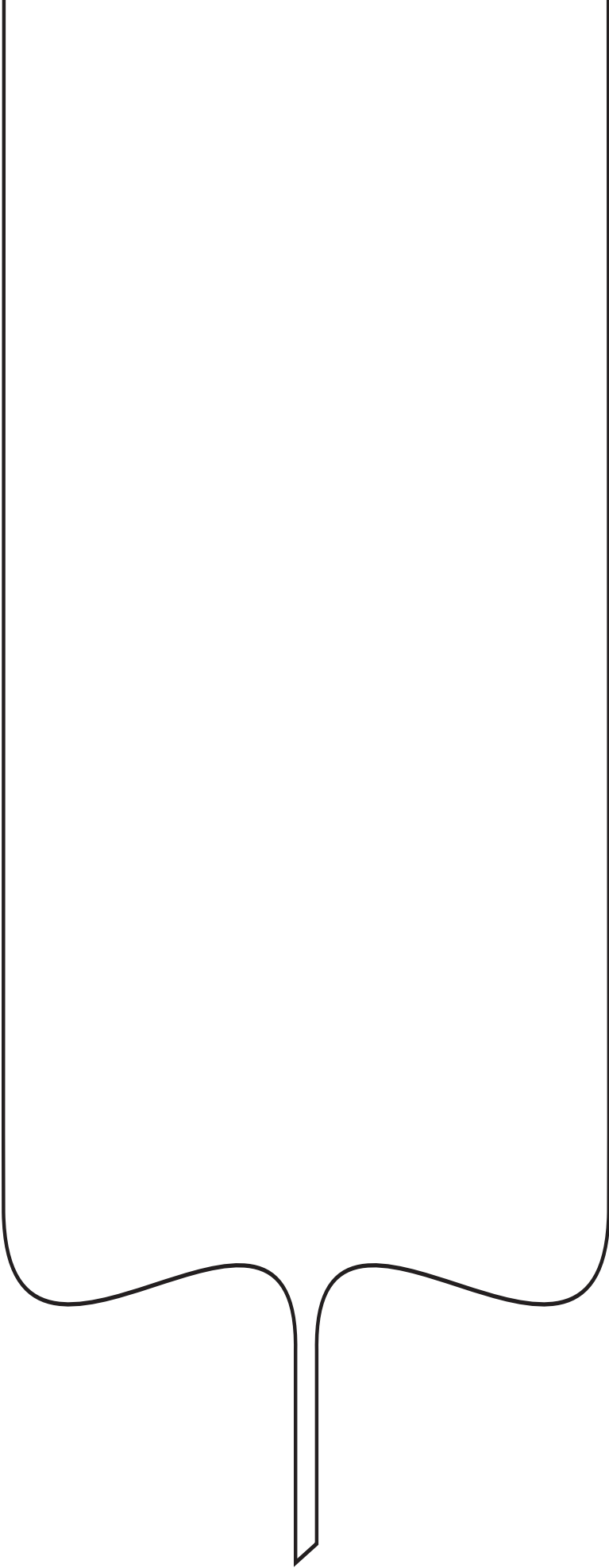
Handout 2: Feathers



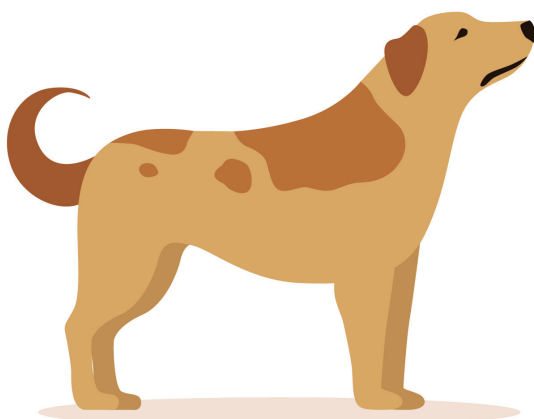
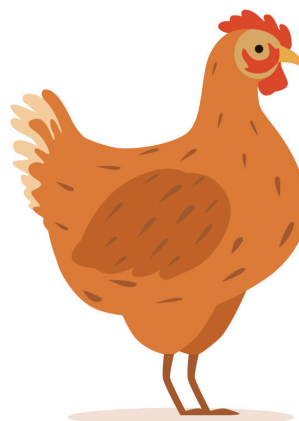
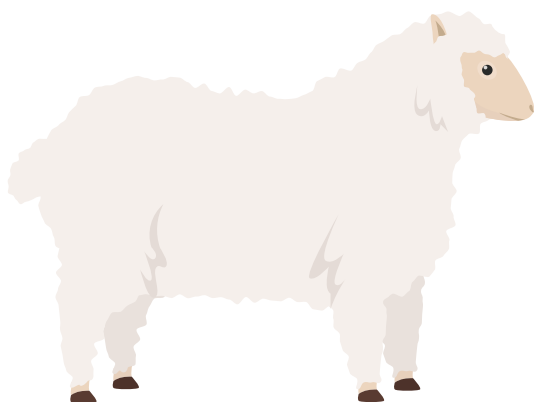
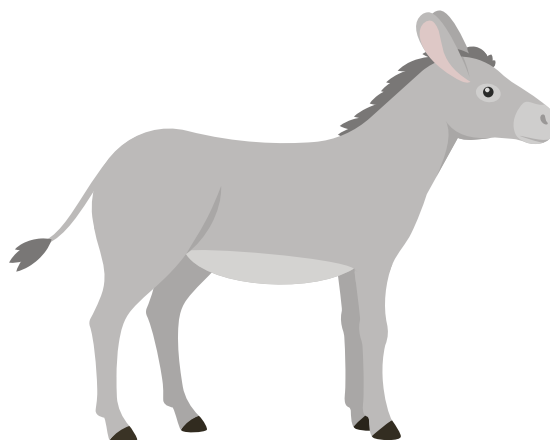
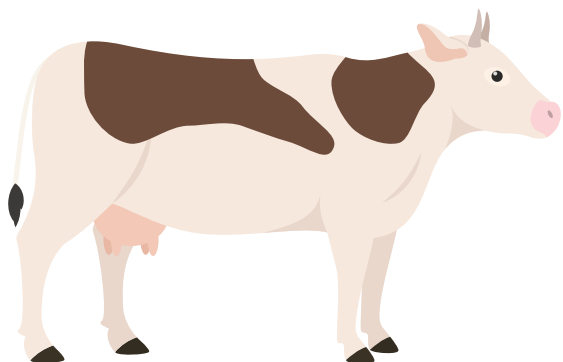
Handout 3: Feather Top Template



Handout 4:
Feather
Bottom
Template



Handout 5: Farm Animal Cards





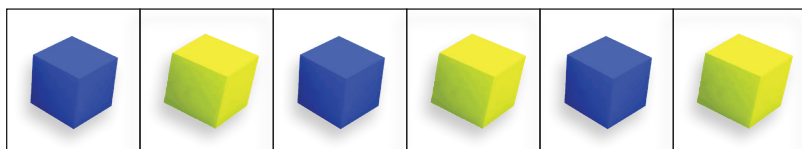
Just for Families

Block Patterns

A pattern is anything that repeats according to a rule—like how the stripes on this shirt and the beads on this bracelet are repeated by alternating colors.

Noticing patterns, making patterns, and describing patterns are beginning math skills that your child will use later in everything from counting to algebra. Here's how to practice patterns at home.

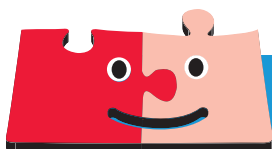
You can make a pattern for your child and ask questions about it. Blocks of two colors are a good place to start. Two kinds of utensils (fork and spoon) or two kinds of food (cracker and apple slice) would work, too. This pattern is blue/yellow. Keep in mind that children need to see 3 examples of the pattern in order to figure it out, like you see below: blue/yellow – blue/yellow – blue/yellow.



Help your child notice the pattern by talking about it together. You can ask questions like:

- What do you see? (Let's say what we see: blue, yellow, blue, yellow.)
- What color block do you think should come next?
- (Ask your child to turn away while you remove a block.) What color is missing from our pattern now?

Let your child choose two items—like white socks and black socks—**and make their own pattern.** Encourage them to tell you about their pattern and see if you can guess what comes next!



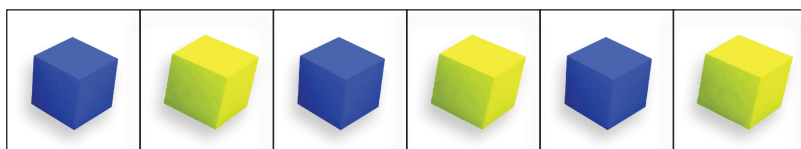
Solo para familias

Patrones de bloques

Un patrón es cualquier cosa que se repite, como la forma de las rayas de esta camisa y las cuentas de esta pulsera forman patrones.

Notar patrones, hacer patrones y describir patrones son habilidades matemáticas que su hijo usará más adelante en todo, desde el conteo hasta el álgebra. A continuación, le indicamos cómo practicar patrones en casa.

Puede hacer un patrón para su hijo y hacer preguntas al respecto. Los bloques de dos colores son un buen lugar para comenzar. Dos tipos de utensilios (tenedor y cuchara) o dos tipos de alimentos (galleta salada y rodaja de manzana) también funcionarían. Este patrón es azul y amarillo. Tenga en cuenta que los niños necesitan ver 3 ejemplos del patrón para resolverlo, como se ve a continuación: azul y amarillo - azul y amarillo - azul y amarillo.



Ayude a su hijo a notar el patrón hablándolo juntos. Puedes hacer preguntas como:

- ¿Que ves? (Digamos lo que vemos: azul, amarillo, azul, amarillo).
- ¿Puedes decir qué bloque de color viene después?
- (Pídale a su hijo que se aleje mientras usted quita un bloque). ¿Qué color falta ahora en nuestro patrón?

Deje que su hijo elija dos artículos, como dos calcetines diferentes o dos zapatos diferentes, y haga su propio patrón. **¡Anímelo a que le cuenten sobre su patrón** y vea si puede adivinar lo que sigue!