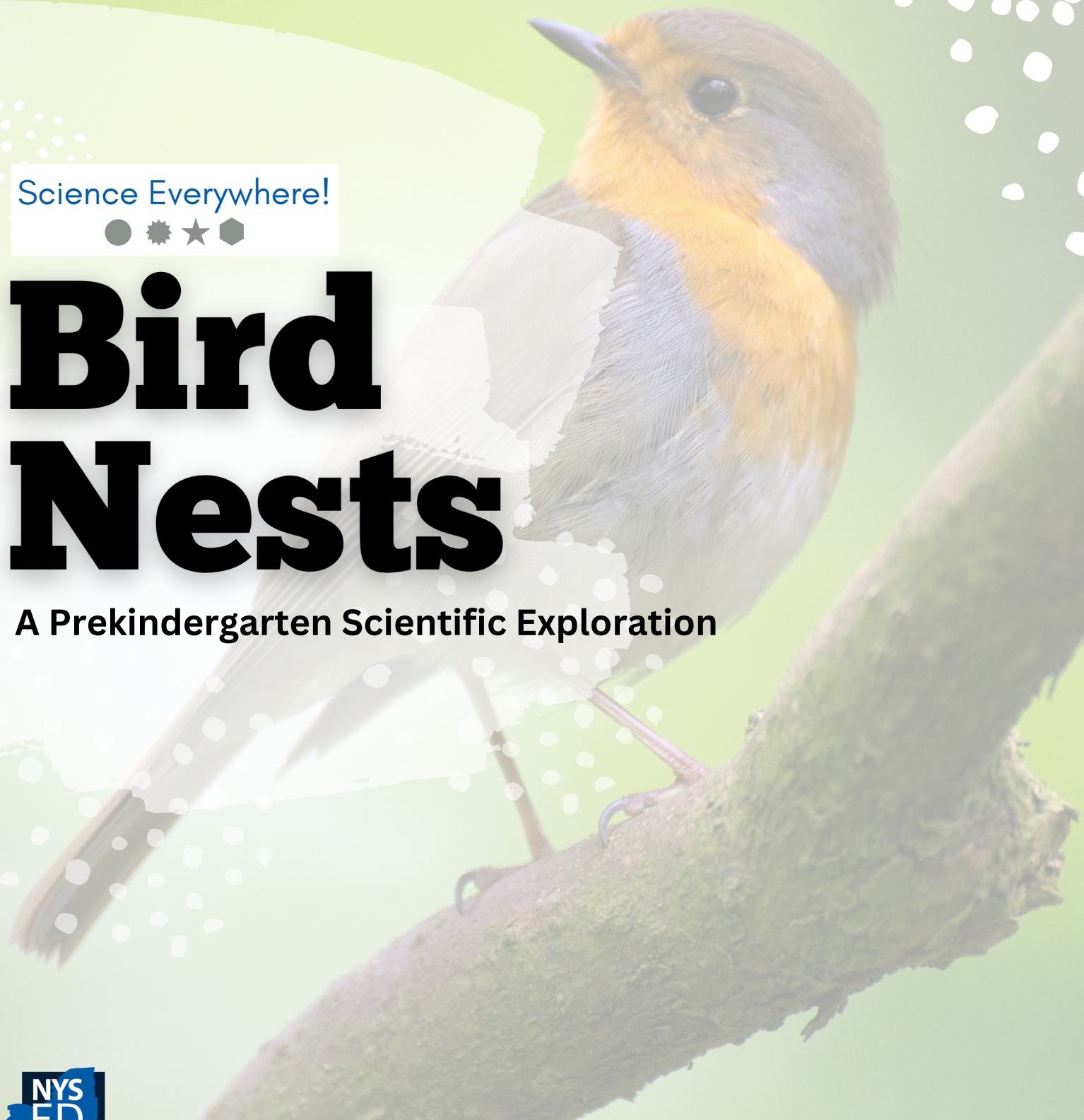


Science Everywhere!



Bird Nests

A Prekindergarten Scientific Exploration





Introducing Inquiry-Based Learning with Birds

Are you searching for a fresh and engaging way to inspire your students? Then look no further than the abundant bird species found throughout New York State! With over 450 unique types, you're bound to spot birds just outside your classroom windows, at any time of the year.

Birds are a natural source of wonder for children, with their captivating songs, flying prowess, and incredible range of shapes, sizes, and colors. By observing and learning about these feathered creatures in their local communities, students can gain a deeper appreciation for the many bird species, adaptations and behaviors that make birds so fascinating.



Birds



Introduction

Science Everywhere

Science Everywhere is an initiative designed for prekindergarten students that emphasizes Inquiry-Based Learning, commonly known as IBL. Spearheaded by the New York State Education Department's Office of Early Learning and Office of Cultural Education, the initiative aims to cultivate a love of science and nature in young children through hands-on learning while fostering important critical thinking and problem-solving skills.

What is Inquiry-Based Learning?

IBL is an instructional approach to learning where students take the lead in their learning process, starting with questions stemming from their own curiosity. This approach transforms both indoor and outdoor learning environments into lively spaces for exploration, fostering a scientific mindset among students. By posing questions, making decisions, and conducting explorations to find solutions, students actively engage in the learning process. This method not only captivates children's interest but also nurtures qualities like curiosity, creativity and persistence, while enhancing problem-solving and critical thinking skills (Daniels, 2017).

The Role of the Teacher

In a structured inquiry for prekindergarten children, the teacher assumes an intentional approach. They curate learning activities that encourage students to express their creativity through various means like drawing, writing, and speaking. Furthermore, teachers establish connections between students and experts or community members, introduce fresh topics or concepts to sustain engagement and enthusiasm. They also foster collaborative interactions among peers, exemplify inquiry-based thinking processes, and oversee classroom dynamics to ensure universal student involvement.

Student-Led Discovery

Establish chances for students to collaborate and uncover new insights together by engaging in hands-on activities and guided discussions facilitated by the teacher. Throughout large and small group activities, children can learn about bird nests and how they serve as homes for various bird species. They can explore how different birds build their nests by instinct in various ways and locations, depending on their species and habitats. While nests differ in size and location, they share common characteristics, providing a warm and secure home for eggs and baby birds, otherwise known as fledglings.

Scientific Phenomena and Inquiry-Based Learning

A scientific phenomena refers to a natural event or incident that can be explained through observations and evidence. Scientists explore these occurrences to gain a deeper understanding of the natural world and to develop theories that unveil new theories of the natural world. The investigation of scientific phenomena represents a captivating and ever-evolving realm that pushes the boundaries of our understanding of the universe. Introducing scientific phenomena in Inquiry-Based Learning (IBL) aids in fostering a scientific exploration mindset among our youngest learners.

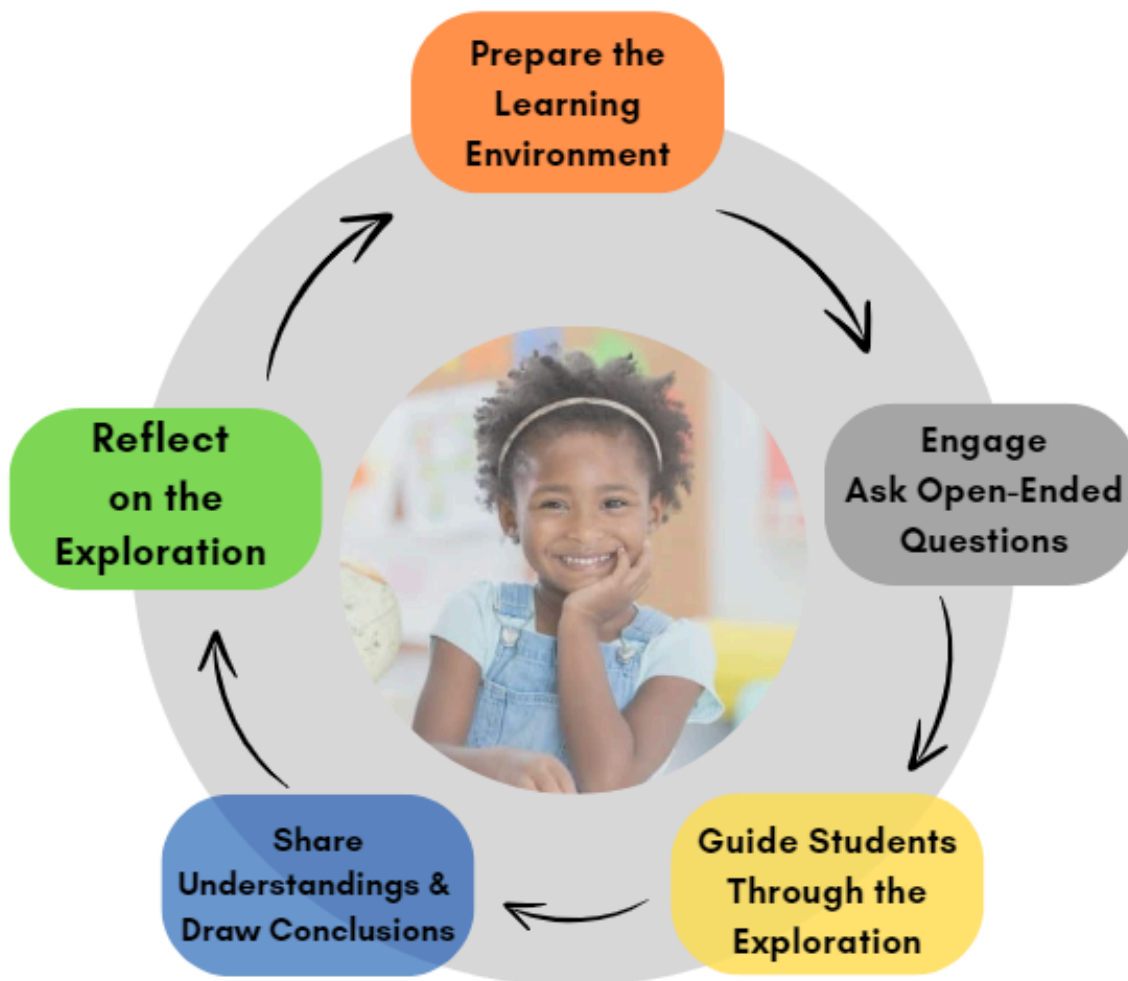


The Inquiry Cycle

The Inquiry Cycle serves as a vibrant learning process within the Inquiry-Based Learning (IBL) approach. This cycle comprises five phases where the child takes the central role and is propelled by their natural curiosity to steer the inquiry. While the process is structured, educators are urged to tailor the guidance to align with students' learning preferences and curiosities, allowing for a non-linear progression in the cycle. After students engage in reflective practices and acquire knowledge, educators can introduce fresh inquiry challenges related to the current subject or delve into new topics.

By encouraging students to interact with new materials and observe scientific phenomena, educators can naturally stimulate further inquiries, fostering a deeper level of engagement. It is crucial to underline the significance of continuous exploration of previous subjects, even as the class transitions to new areas, as this practice is not only endorsed but fundamental to the principles of IBL (Inquiry Science | Science in Pre-K, n.d.).

Inquiry Cycle





Bird Nests

A Prekindergarten Exploration

Upon completion of this exploration, students will be able to:

- Enumerate the different locations where birds construct their nests and the reasons behind their choices.
- Create a bird nest model using innovative design techniques.
- Ask questions based on observations to find more information about bird nests.
- Explore the purpose and creation of bird nests while recording thoughts, ideas and observations.

Prepare the Learning Environment

To prepare the learning environment in a structured inquiry, the classroom environment and learning centers are conducive to exploration and aligned with the subject matter prior the start of the exploration. When students enter the classroom, they should be immersed in the topic. For this exploration, bird-related visuals, texts, and ambient bird sounds fill the classroom (see Appendices for resources). Additionally, the teacher should have prior knowledge of bird basics and potential vocabulary that can be imbedded throughout the exploration.

When creating the classroom environment be sure to provide:

- Inspiration and Displays of Student Learning- Photographs of birds and nests throughout the classroom. Leave open wall space to serve as a canvas to exhibit student artwork and collaborative anchor charts that document their discoveries.
- Prepared whole group and small group learning activities to engage and guide students through the exploration.
- Themed Learning Centers - Science does not have to stay in one center. Centers are a great way to integrate exploration and problem-solving across content areas.
- Go beyond the classroom- Go on a nature walk, take a field trip to a local pet store that has birds, or a museum with a bird exhibit. Exploring bird nests virtually can be a great option (Appendix G).

When studying bird nests, *some materials might include, but are not limited to:*

- Topic-related fiction and non-fiction books for read-aloud, classroom library, and learning centers
- Images of birds and their nests
- Birdseed (if nut allergies use dyed dry rice or dried chickpeas)
- Bird Nest *Model* Materials (Materials include things birds do not use, e.g., pipe cleaners, pretend grass, tissue paper, shredded paper, cotton balls)
- Toilet paper rolls
- Feathers (from a craft store)
- Preschool-sized tongs/clothespins
- Playdough
- Paints
- Paper plates, bowls
- Natural items (e.g., twigs, grass, acorns)
- Egg cartons
- Pom-poms
- Plastic eggs
- Craft sticks
- White paper (preferably cardstock)

When selecting items for an exploration, keep in mind the following:

- Are they child-friendly and interesting?
- Will they be accessible to the children?
- Is there enough to explore, but not too much to be overwhelming?
- Switch out the materials to keep students engaged.

The use of authentic nests in this exploration is not advised as it is illegal in New York State to remove or move bird nests from the wild.



Bird Basics

- Birds have a backbone.
- Birds are warm-blooded animals, which means that their body temperature stays about the same regardless of the temperature of their surroundings.
- Birds are the only animals with feathers and all birds have wings, but there are a few species of birds that cannot fly.
- Birds have a beak or a bill without any teeth.
- Adult female birds lay eggs that have a hard shell.
- In most species of birds, the female bird alone builds the nest, however, in other species the job is shared equally, or the male bird builds a nest to attract the female.
- Different nest types are associated with different looking and shaped eggs. Cavity nesters generally lay plain white or blue eggs because the nest itself is concealed in the cavity, and no camouflage is needed. They also lay spherical eggs, because they never roll out of the nest. Ground nesting birds all lay speckled eggs that are well camouflaged.
- The most common natural food sources for many bird species include insects, fruits, berries, and nectar from flowering plants. Some birds will suck sap out of tree buds.
- Feathers can keep birds warm. For birds that fly, wing feathers allow flight and tail feathers are used for steering while flying. The color of a bird's feathers can be used to help them hide or help them find a mate.
- Birds communicate by making a variety of sounds and songs.
- Birds have excellent eyesight and most birds cannot move their eyes.

To learn more about birds visit www.allaboutbirds.org



Vocabulary

(Appendix B)

- | | |
|--------------------|--------------|
| • cup nest | • camouflage |
| • mud nest | • worms |
| • ground nest | • fly |
| • cavity nest | • hatch |
| • platform nest | • predator |
| • cliff/ledge nest | • tree |
| • rootlets | • cavity |
| • build | • shrub |
| • feed | • protect |
| • incubate | • instinct |
| • defend | • shelter |
| • feather | • cliff |
| • bird | • cave |
| • beak | • barn |
| • habitat | • building |
| • nest | • species |
| • wings | • fledgling |
| • perch | • eggs |
| • branch | • birdhouse |



Types of Birds' Nests

Type of Nest	Description of Nest	New York State Bird
Woven Cup Nest	<p>Many bird species utilize cup-shaped nests made of a sturdy outer shell woven from materials such as twigs, bark strips, grass, rootlets, tendrils, and fine vines. These nests are then cushioned with soft materials such as moss, downy feathers or fluffy seeds. Spider's web is commonly used to secure the nest, while additional elements like lichen and moss are incorporated on the exterior to blend in with the environment. These nests are typically positioned in the fork of a tree.</p>	<ul style="list-style-type: none"> • American Crow • Blue Jay • American Robin • Ruby-throated Hummingbird • Northern Cardinal • American Goldfinch • Chipping Sparrow
Mud Nest	<p>Birds create mud nests by collecting wet mud pellets in their beaks and placing them methodically, forming cohesive nuggets that harden and bond together. These nests are strong and durable and can adhere to vertical surfaces like cliffs. Typically cup-shaped, mud nests are spotted in barns, beneath bridges, on cliffs, and various man-made structures.</p>	<ul style="list-style-type: none"> • Barn Swallow • Purple Martin
Ground Nest	<p>Ground-nesting birds gather twigs, leaves, and feathers from their habitat to craft their nests. Despite the vulnerability of their choice in nesting location, these resourceful birds have evolved unique strategies to protect their homes and young from potential predators.</p>	<ul style="list-style-type: none"> • Killdeer • Mallard • Wild Turkey • Northern Harrier
Cavity Nest	<p>Several bird species rely on natural holes or cavities in live or dead trees, as well as other structures such as buildings, for nesting purposes. Some birds possess the ability to excavate their own cavities. Various bird species line their nests with different materials, such as feathers, string, or even garbage. For instance, the Pileated Woodpecker solely relies on leftover wood chips to line their nests.</p>	<ul style="list-style-type: none"> • Downy Woodpecker • Pileated Woodpecker • Black-capped Chickadee • European Starling • House Sparrow • House Wren
Platform Nest	<p>Platform nests are typically larger in size and made of wood twigs arranged in the fork of a tree, cliff ledge or man-made structure to create a foundation for laying eggs.</p>	<ul style="list-style-type: none"> • Bald Eagle • Red-tailed Hawk • Sharp-shinned Hawk
Ledge/Cliff Nest	<p>In ledge or cliff nests, birds often do not construct structural nests; instead, they lay eggs that are pointed at one end. This shape prevents the eggs from rolling over the edge by allowing them to pivot around the point. The nesting sites on ledges provide additional protection from predators. Cliff-dwelling birds, such as ravens and falcons utilize cliffs for nesting, creating stick nests in crevices instead of structurally building nests.</p>	<ul style="list-style-type: none"> • Cliff Swallow



Thematic Learning Centers

Opportunities for new discoveries and sharing new learning will be available during center time. Learning centers are planned and arranged before students begin their exploration (Appendix J). Consistently rotating activities and materials within these learning centers is essential to maintaining student engagement.

<p style="text-align: center;">Art</p> <ul style="list-style-type: none"> • Use feathers as brushes to paint. • Creating bird sculptures using playdough and images of various bird species as references. • Free drawing exercise of birds either from observations made in the classroom, nature or using images. • Paint birds using watercolors. 	<p style="text-align: center;">Dramatic Play</p> <ul style="list-style-type: none"> • Provide a large cardboard box or several smaller ones to act as nests. • Create a life-size bird nest using a plastic kiddie pool, fill materials to resemble a cozy bird nest. • Incorporate the bird puppets created in the small group activities (See Small Group Activities p. Bird Puppet). 	<p style="text-align: center;">Library</p> <ul style="list-style-type: none"> • Curate a collection of both fiction and non-fiction literature on birds and establish a comfortable reading environment. • Bird matching, match the pictures of various birds while learning the names of a variety of birds-print two sets of bird cards (Appendix C). • Bird Themed Word Wall (Appendix B).
<p style="text-align: center;">Mathematics</p> <ul style="list-style-type: none"> • Categorize birds by their color and/or size (small, medium, large) • Sort animals into categories such as birds and not birds. • Create a bird with shapes. • Sequence building a nest (Appendix E). • Visit www.allaboutbirds.org live feeder cam- count the number of different bird species that visit the feeder (Appendix G). 	<p style="text-align: center;">Writing</p> <ul style="list-style-type: none"> • Create a bird seed writing tray where students can practice letter formation. This can be facilitated by providing alphabet cards or magnetic letters. For example, pick a magnetic letter out of a nest or place the letter in a plastic egg. The letter that is revealed will be formed on the seed writing tray. • Youtube.com- Observe and record/draw observations using paper, a clipboard and drawing materials. 	<p style="text-align: center;">Music/Movement</p> <ul style="list-style-type: none"> • Listen to songs about birds. <ul style="list-style-type: none"> ◦ 5 Little Ducks, ◦ The Chicken Dance ◦ Three Little Birds • Bird Yoga (Appendix F). • Move like birds (fly, flap wings, eat like a bird).
<p style="text-align: center;">Science</p> <p>Create a bird exploration table:</p> <ul style="list-style-type: none"> • Feathers • Nest-building materials (shredded paper, small twigs) • Plastic eggs • Model/toy birds • Bird seed • Bird photographs <p>Provide a magnifying glass and as students explore, scaffold their thinking through discussion.</p>	<p style="text-align: center;">Sensory/Fine Motor</p> <ul style="list-style-type: none"> • Gather a variety of materials, including birdseed, plastic eggs, egg cartons, scoops, pom-poms, plastic eggs, clothespins/tongs, and bird figurines, and place them in a bin for children to explore. • Using clothespins/tongs, place the egg (pom-pom) in the nest (egg carton). 	<p style="text-align: center;">Blocks/Building</p> <ul style="list-style-type: none"> • Take on the role of an architect and construct a bird's nest using a tower of blocks. • Once the nest is constructed, enhance its comfort and appeal by adding soft materials (small blankets, tissue paper, newspaper). • Include some birdie buddies, such as stuffed animals.



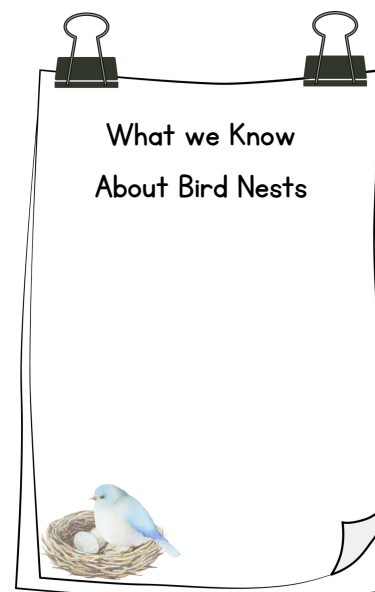
Set the Stage

Gather the class at a central area to open discussion regarding your students' knowledge of birds and their nests. To grab their interest, simply share an experience your students can connect to. "Over the weekend I was on a walk in the park. On my walk I spotted a nest on a tree branch. All of a sudden, a bird flew right past me with pieces of grass hanging from its beak and flew right to the nest I had spotted! Does anyone have any ideas of what the bird was doing?" Allow children to share their ideas. Facilitate the conversation and lead the class to determine that the bird was building a nest. Then state, "Seeing this bird building a nest made me have so many questions about bird nests. What do we already know about bird nests?" As students share their insights, document their thoughts on an anchor chart to be displayed prominently in the classroom for the duration of the Exploration (Appendix K).

Sample questions to facilitate discussion:

- Where do you find nests?
- What does a bird nest look like?
- What is the purpose of a birds nest?
- Do most birds build nests?
- What do birds use to make their homes?
- Do all birds build the same size nest?

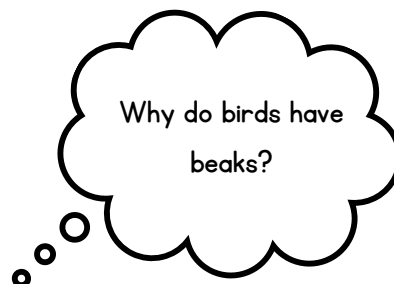
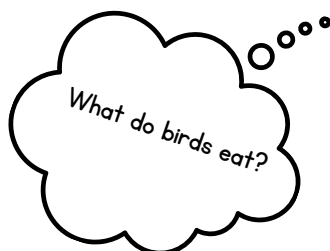
Following the discussion, guide your students on a brief ten-minute nature walk to observe bird nests and birds in their natural habitat. In cases where a nature walk is not feasible, utilizing the [Cornell Lab Bird Cams](#) can serve as an excellent alternative activity.



Create A Wonder Wall

Following the nature walk, gather students for a discussion about their observations. State, "We are going to be investigating bird nests! How they are made and why birds need them. After our walk I have so many more questions about birds. What are you wondering?" Utilize these findings as a foundation to explore additional "I wonder" questions and initiate a class-wide conversation. These questions can be referred to organically throughout the Exploration or used as a future Exploration depending upon students' engagement in the topic. It is important to record each student's response with their name. All questions can be displayed in the classroom and titled, "I Wonder Wall" (Appendix A).

Please note that at the prekindergarten level, students may require assistance in articulating their thoughts into questions. For instance, a student who verbalizes a fascination with the varying colors of birds might benefit from guidance in converting this interest into the question form of "I wonder why birds are different colors?"





Let the Exploration Begin! Guide Students through the Exploration and Support in Sharing their Understandings

At the core of this inquiry lies the fundamental question: "What are Nests?" Yet, this seemingly straightforward question encompasses a wealth of learning opportunities for students to explore and expand their knowledge of birds. These include the diverse construction methods deployed in nest-building among different species of birds and their habitats and how these structures safeguard the fledglings. Ultimately discovering that birds use nests for shelter and protecting their fledglings.

Whole Group Learning Activities

Navigate Nonfiction Texts

On the floor or tables, spread an assortment of nonfiction texts that contain a variety of bird species and their nests (Appendix H). Encourage students to examine the pictures and identify features they recognize about the nests. Guide them by citing examples such as "I see a big nest."

Ask students:

- Who do these nests belong to?
 - A big bird or a small bird?
 - How long does it take to build a nest?
- Where are these nests built?
 - High in a tree?
 - On a branch?
 - In a tree trunk?
- What are the nests made of?
 - Why do you think they are made of these materials?

Sample Teacher Language:

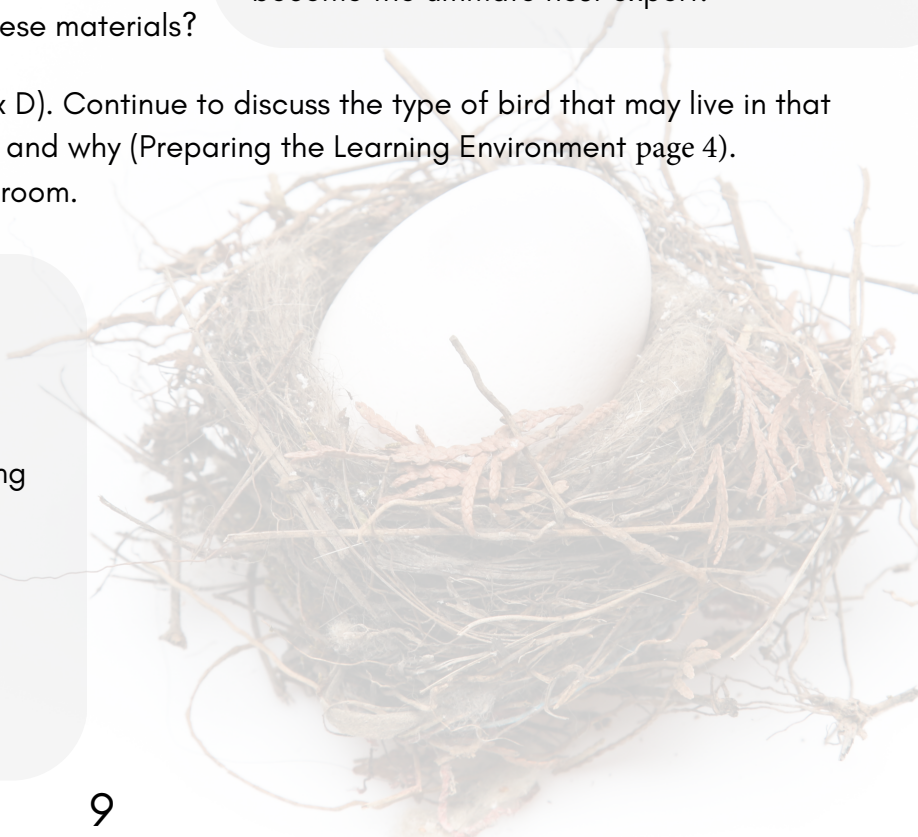
Put on your explorer hat because today we're venturing into the wild world of nests! We'll be checking out all the coolest spots from tippy treetops to underground homes. We'll learn about where birds are living and what they're using to build their shelter. Get ready to become the ultimate nest expert!

Display additional images of bird nests (Appendix D). Continue to discuss the type of bird that may live in that nest, the structure of the nest, the materials used and why (Preparing the Learning Environment page 4).

Display these images in a visible area in the classroom.

Sample Teacher Language:

Have you ever wondered why birds spend hours building their nests? These nests are like cozy homes for their eggs and fledglings. And guess what? Their instincts are like a superpower, guiding them to build the exact same nest their parents made! It's like they just know how to do it. These nests keep fledglings safe and snug from harm's way. So, why do birds need a shelter like this? To protect themselves and their fledglings. Protect means to keep safe.





Pretend to be a bird

To encourage creativity and exploration, request your students to imagine being birds and search for an ideal site to build a nest. This activity can be conducted either indoors or outdoors, depending on the available resources. Various bird species construct their nests in diverse settings, so students can use their ingenuity to determine the best spot to build a nest. Subsequently, allow your students to share their thought processes on their preferred location for the nest. This helps in fostering a better understanding of the birds' habitat and behavior while promoting critical thinking among the students.

Sample Teacher Language:

Birds nests can be found in many different places. Even spots you may not think of- tree branches, the ground, city skyscrapers, you name it! Every bird species has their own unique nests, but one thing's for sure - a strong nest keeps them cozy and secure from harsh weather like thunderstorms and snow. It even keeps them safe from sneaky predators. A predator is an animal that hunts and eats another animal for food. No wonder it's the perfect place to call home!

Gather Nest Materials

The children can collect a variety of materials to construct a model of a bird's nest, either inside or outside the classroom. Grass, hair, straw, twigs, paper, mud, or string can be gathered to create a protective and comfortable environment for the eggs. Teachers can facilitate discussions on the various materials birds use to construct their nests and encourage children to brainstorm ways to keep the eggs warm once they are laid (typically, the bird will sit on the eggs). As an added challenge, students can be provided with a tool that simulates a bird's beak, such as preschool-sized tongs or clothespins, to aid in the collection of materials.

Sample Teacher Language:

Birds are master builders. They're always on the hunt for the perfect materials to create their cozy homes. Imagine you were a master nest builder. What materials do you think birds might use to create a warm and fuzzy nest for their precious eggs?

Small Group Learning Activities

Nest Sequencing:

Develop a visual sequence of a bird constructing its nest, utilizing photographs that capture each stage of the process. Prompt students to engage in an oral discussion, examining each step while providing support that enables them to share their comprehension of the process of a bird constructing its nest, as well as the function of the nest (Appendix E).



Create a Model Nest

Your students have likely gathered materials necessary for creating a model of a bird's nest. It's now time for them to apply their knowledge and build their own model, incorporating the collected materials. Additional model materials may be provided along with plastic eggs or pom-poms to resemble eggs (see Preparing the Learning Environment, p. 4). Using playdough as a base within a paper plate bowl, students can shape and construct their model in a manner that reflects their creativity. Support students in the process of trial and error as they construct their model, asking reflective questions such as "What worked in your model?" "What didn't work in your model?" "What would you try differently next time?"

Sample Teacher Language:

When a bird builds its nest they add a soft touch to make it like a snuggly bed. But, what does a bird use to make it cozy? And why go to such lengths? Well, it's all about keeping their precious eggs and fledglings safe and sound. Bird eggs and fledglings are as fragile as can be and come in all different shapes and sizes. So, it's no wonder a bird wants to cushion them with the softest and safest materials around!

Bird Puppet

Provide white paper or cardstock, if available. Supply students with an assortment of materials such as markers, crayons, pipe cleaners, and feathers to design their own unique bird. Encourage the students to explain their choices in creating their bird, such as its color or size. Further, have them describe their bird's potential habitat and nest characteristics. After the bird is complete, students can glue or tape it to a popsicle stick, creating a puppet for use in the dramatic play learning center.

Sample Teacher Language:

Imagine a bird with your eyes closed. Picture any bird species. What size is it – big or small? What color feathers does it have? Does it possess a long, sharp beak or a short, dull one? Let's bring your bird to life!

Bird Watching Data Collection

Utilize the [Cornell Lab Bird Cam](#) or any other source of bird watching to have students collect data and record observations. Bird watching can be a fascinating and educational activity for students of all ages. By utilizing resources like the Cornell Lab Bird Cam or other bird watching tools, students can actively engage in collecting data and recording their observations of various bird species and their bird nests. This hands-on approach not only enhances their understanding of different birds' behaviors and characteristics but also promotes a deeper appreciation for the natural world around them. Encouraging students to document their findings can lead to meaningful discussions and opportunities to analyze patterns in nesting habits and even feeding preferences. Overall, integrating bird watching into the learning experience can spark curiosity, foster a sense of environmental stewardship, and inspire a lifelong interest in ornithology (Appendix L).



Reflect on the Exploration

It's time to pause and reflect. An inquiry never really ends. While this bird nest exploration is coming to an end, thinking may be "shelved" for a period. Although the students' pursuit of knowledge may have reached its conclusion, their curiosity persists.

In the inquiry cycle, it is paramount to take the lead from your students. Tailor instruction to match their curiosity and interests. Suppose your students exhibit high motivation for exploring the topic of birds and are enthusiastic about continuing their exploration. In that case, revisiting the Wonder Wall created at the start of the inquiry and persisting with further learning is recommended.

Reflection is an integral component throughout the inquiry learning process. It's not just about asking students to consider their opinions on the subject matter, but also reflecting on the learning process itself. This is where metacognition comes into play; encouraging students to think about their thinking. Scientists are always asking, "What's Next?" They ponder what their next question may be or what their next exploration may be. By focusing on how they learned, in addition to what they learned, students can improve their overall learning experience and continue to explore like a scientist.

Sample Teacher Language:

- What is one interesting thing you learned about birds this week, today, or during this activity?
- What do you think you did well today?
- What was challenging for you during this activity?
- What accomplishment during the activity made you feel proud?
- What else would you like to learn about birds?
- Which aspect of this project did you enjoy the most, and why?
- What went well when creating your model?
- What changes to your model would you make for next time?
- How are models different from real birds' nests?

Additional Bird Explorations:

- What makes a bird a bird?
- Why do birds need feathers?
- Do birds have different beaks?
- How do birds survive?
- Do all birds make the same sounds?



Timelines and Classroom Management



Inquiry projects can vary in duration, taking anywhere from a few weeks to several months, depending on how interested children remain in the topic of exploration. It is important to remember that if children lose interest, it's time to move on to a new exploration to keep them engaged and motivated.



NYS P-12 Science Learning Standards Connections

The [New York State P-12 Science Learning Standards](#) are a series of performance expectations that define what students should understand and be able to do as a result of their study of science. Although this exploration is written for prekindergarten students, teachers in Grades K-3 can use the activities and materials to adapt to their grade level as noted by the standards below.

Kindergarten Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.
- K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
- K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
- K-ESS3-3. Communicate solutions that will reduce the impact of humans on living organisms and non-living things in the local environment. *

Grade 1 Structure, Function, and Information Processing

- 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.*
- 1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
- 1-LS3-1. Make observations to construct an evidence-based account that some young plants and animals are similar to, but not exactly like, their parents.

Grade 2 Interdependent Relationships in Ecosystems.

- 2-LS2-2. Develop a simple model that illustrates how plants and animals depend on each other for survival. *
- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.

K-2 Engineering Design

- K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

[The New York State Resource Guides for School Success: The Prekindergarten Early Learning Standards](#)

consolidates all learning standards for four-year-old students into one document. This resource provides a uniform format for learning standards in all content areas to make it easier for users to read and understand.



References

- Association of Fish & Wildlife Agencies. (2022). Project Wild. [Www.fishwildlife.org](http://www.fishwildlife.org).
<https://www.fishwildlife.org/projectwild>
- Brewka, R. (2019–2023). Birds of New York. [Www.birdsofnewyork.com](http://www.birdsofnewyork.com).
<https://birdsofnewyork.com/bird-list/>
- Conezio, K., & French, L. (2002). Science in the Preschool Classroom Capitalizing on Children’s Fascination with the Everyday World to Foster Language and Literacy Development. *Young Children*, (57)5, 199–209.
https://www.researchgate.net/publication/237714574_Science_in_the_Preschool_Classroom_Capitalizing_on_Children%27s_Fascination_with_the_Everyday_World_to_Foster_Language_and_Literacy_Development
- Cornell Lab of Ornithology. (2024). Celebrate Urban Birds. [Www.birds.cornell.edu](http://www.birds.cornell.edu).
<https://celebrateurbanbirds.org/>
- Cornell Lab of Ornithology. (2024). Your wildlife media archive since 1929. [Www.macaulaylibrary.org](http://www.macaulaylibrary.org).
<https://www.macaulaylibrary.org/>
- Daniels, H. (2017). *The curious classroom: 10 structures for teaching with student-directed inquiry*. Heinemann.
- MacKenzie, T. (2016, December 1). Bringing Inquiry-Based Learning Into Your Class. *Edutopia*.
<https://www.edutopia.org/article/bringing-inquiry-based-learning-into-your-class-trevor-mackenzie/>
- Mass Audubon. (2015). Our Feathered Friends STEM Preschool Teaching Unit. [Www.massaudubon.org](http://www.massaudubon.org).
<http://www.massaudubon.org/education>
- New York State Museum. (n.d.) Birds of New York. www.nysm.nysed.gov.
<https://www.nysm.nysed.gov/exhibitions/online/birds-of-new-york>
- Public Broadcasting Service (PBS). (2024). Explore the Outdoors. [Www.pbs.org](http://www.pbs.org).
<https://www.pbs.org/parents/explore-the-outdoors>
- Rahmi, Y.L., Alberida, H., & Astuti, M.Y. (2019). Enhancing students’ critical thinking skills through inquiry-based learning model. *Journal of Physics: Conference Series*, 1317, 012193.
<https://iopscience.iop.org/article/10.1088/1742-6596/1317/1/012193>
- The Cornell Lab. (2019). Online bird guide, bird ID help, life history, bird sounds from Cornell. All about Birds.
<https://www.allaboutbirds.org/news/>
- The National Audubon Society. (2024). A Bright Future for Birds and the Planet. [Www.audubon.org](http://www.audubon.org).
<https://www.audubon.org/>
- The Smithsonian Institution. (n.d.). Inquiry Science/Science in PreK. [Scienceinprek.si.edu](http://scienceinprek.si.edu).
<https://scienceinprek.si.edu/inquiry-science>
- Trna, J., Trnova, E., & Sibor, J. (2012). Implementation of Inquiry-Based Science Education in Science Teacher Training. *Journal of Educational and Instructional Studies in the World*, (2)4, 199–209.
https://www.researchgate.net/publication/272786501_IMPLEMENTATION_OF_INQUIRY-BASED_SCIENCE_EDUCATION_IN_SCIENCE_TEACHER_TRAINING