

# BUILD A BETTER BIRD NEST STEM ACTIVITY

## CHALLENGE

Design and build a functional bird nest for a designated bird species. Determine the following information during the research portion of the activity.

- Nest type
- Typical habitat
- Nesting material used
- Size of the nest - calculated by the size of the designated bird species & it's typical brood size
- Strength of the nest - determined by the weight of the adult bird(s) & the number of eggs/chicks
- The durability - the nest needs to hold up against the wind, rain, major storms, etc.

**Note:** A list of useful resources can be found at the end of this document.

## OBJECTIVE

- Demonstrate the ability to work through the engineering design process as a group.
- Research and analyze the data on the assigned bird species' nest type.
- Research and analyze the data on the assigned bird species' nest construction, including but not limited to:
  - Preferred nest location (habitat)
  - Nesting material
- Calculate the nest size needed using the size of the assigned bird species, its brood size, and the size of its eggs.
- Construct a bird nest similar to how the designated bird species' nest is built.
- Confidently and thoroughly discuss the group's findings and build process.
- Answer any questions after the discussion section.

## VOCABULARY

Ornithology, species, brood, adherent, burrow, camouflage, pendant, scrape, habitat



## MATERIALS NEEDED

The materials needed for our **Build a Better Bird Nest STEM Activity** will differ based on the age of your kids, the amount of time available, and the natural material in your area.

### 1. CRAFT SUPPLIES THAT MIMIC NATURAL NESTING MATERIAL

If you're working with younger kids or there is a lack of natural material in your area, you can set up a craft table where your kids can select the materials needed to build their nest type. This table can include alternative items to represent what the actual bird would use. You can include items such as *clay, pipe cleaners, feathers, string, cotton, fake grass, fake moss, small pebbles, etc.*

### 2. NATURAL NESTING MATERIAL GATHERED IN ADVANCE

If time or location issues prevent your kids from being able to gather the natural material they need, you can gather the supplies in advance, and set up a natural material table. This table should include *grass, leaves, straw, pine needles, mud, etc.*

### 3. NATURAL NESTING MATERIAL GATHERED DURING A NATURE WALK

If you have the time and ability to take your kids on a nature walk, let them gather the natural material they need themselves - after they've brainstormed on their designated bird species and drawn up a few nest design ideas.

## PROCEDURE

How you use the procedure steps below will be determined by the age of your kids and the amount of time you have available to work on this activity. If you're using this STEM activity with your kids in January or early February, you can include a discussion about the **Great Backyard Bird Count** (discussed at the beginning of our **Build a Better Bird Nest STEM Activity** blog post).

### 1. Gain your kids' interest in bird nests at the start of this activity.

Read an age-appropriate story about bird nests, then finish the introduction with some bird nest fun facts. For example:

- Many hummingbird species use spider silk to hold their nests together. The spider silk allows the nest to expand as the baby birds grow.
- Birds have been known to build their nests in some pretty unique locations, including mailboxes, dryer vents, and traffic signals.
- Bald eagles build very strong nests they'll use and add on to year after year. One eagle nest was recorded to be 20 feet deep and weighed roughly 2 tons.





## 2. Engage your kids in a discussion about their personal experiences.

Spend a few minutes talking with your kids to see what types of experiences they've had with birds.

- Have they seen a bird gathering material for a nest?
- Have they ever seen a nest on the ground after a storm?
- Do they have a favorite backyard bird they like to watch?
- How many of your kids have a bird feeder or two at home?

Encourage your kids to actively engage in this discussion.

## 3. Discuss the Engineering Design Process with your kids.

If this is the first time your kids will be following the engineering design process, spend time discussing each step in the process. Finish this discussion with how these steps fit in with this activity.

If your kids have used the engineering design process before, spend a few minutes reviewing the steps followed by how you expect them to be used with this activity.

## 4. Divide your kids into small groups.

What size groups should you use? That can depend on the age of your kids, but as you divide them into groups keep their strengths and weaknesses in mind. Pairing the right kids together can add to the positive experience with STEM activities.

## 5. Assign a designated bird species to each group of kids.

Whether you assign each group a designated bird species, or you let the kids choose from a list of options, our **Types of Bird Nests** table can help. For more thorough coverage of the types of bird nests during the sharing portion of this activity, you may want to assign each group a bird species with a different nest type.

## 6. Have each group of kids research their designated bird species.

The Resources section at the end of this document contains a list of books, websites, and apps to help get your kids started. You can also have them use the worksheets provided in our blog post to keep track of their progress.

## 7. Have each group of kids sketch some nest design options for their designated bird species.

These designs should take the following features into consideration.

- The size of the nest needed.



- The strength and durability required to hold the weight of the bird(s) and their eggs.
- The strength and durability needed to stand up to local weather patterns.
- The type of materials the designated bird species uses.

#### **8. Gather the nesting material.**

- Take a nature walk to gather nesting materials.
- Gather enough natural materials prior to the lesson to save time, and spread these supplies out on a side table for the kids to choose from.
- If you don't have access to natural materials, create a craft supply table for the kids to use instead.

#### **9. Have each group of kids build their nest together as a team.**

Remind your kids that birds build their nests without the use of hands. Prompt them to include some of the interesting methods their designated bird species use to construct their nest during the sharing portion of this activity.

#### **10. Test the nests for strength, durability, and accurate size.**

Have each group of kids test their nest by mimicking a day in the life of their designated bird species.

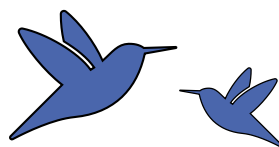
- Place items from the classroom into the finished nest to mimic the size and weight of the designated bird species and their eggs.
- Mimic a variety of weather patterns.

#### **11. Redesign weak points.**

Have each group of kids loop through the design and testing phase of this activity until a useable nest has been built.

## **SHARING**

Once complete, each group should create a report to share their findings. Be sure to have them include how they used the engineering design process to help them build a better bird nest.



## RESOURCES

### BOOKS

**1. Bird Builds a Nest by Martin Jenkins (A First Science Storybook)**

Follow Bird as she builds her nest, turning around and around, using her body to make herself a snug little cup nest (Age 4 - 6).

**2. The Best Nest by P.D. Eastman**

Mr. & Mrs. Bird's search for a better nest leads them on a crazy journey (Age 4 - 7).

**3. This is the Nest That Robin Built by Denise Fleming**

A robin builds her nest with the help of her animal friends, each contributing a key component to her sturdy abode. Denise Fleming wrote with a cumulative, alliterative, and rhyming text (Age 2 - 8).

**4. Mama Built a Little Nest by Jennifer Ward**

A science picture book featuring different kinds of bird nests, each with a four-line rhyming verse as well as a few sentences with additional information, at a higher reading level (Age 4 - 8).

**5. Bird Make Nests by Michael Garland**

A colorful book that introduces over twenty species of birds and the homes they make (Age 4 - 8).

**6. Bird, Nests & Eggs by Mel Boring (Take-Along Guide Series)**

A fun, informative take-along guide that helps your kids identify fifteen different birds. They will also learn how and where these birds build their nests (Age 5 - 10).

**7. National Geographic Kids Bird Guide of North America by Jonathan Alderfer**

This guide features profiles of 50 of North America's most popular birds, including how and where they live with an additional 100 mini-profiles of other birds. Full of fun facts, full-color photos, and activities (Age 8 - 12).





## WEBSITES

### 1. STEM Detective Lab

- Homepage: <https://www.stemdetectivelab.com/>
- Build a Better Bird Nest STEM Activity: <https://www.stemdetectivelab.com/build-a-better-bird-nest-stem-investigation>

### 2. Great Backyard Bird Count

- Homepage: <https://gbbc.birdcount.org/>

### 3. National Audubon Society

- Homepage: <https://www.audubon.org/>
- Searchable Bird Guide: <https://www.audubon.org/bird-guide>

### 4. Cornell Lab of Ornithology

- Homepage: <https://www.birds.cornell.edu/>
- Searchable Bird Guide: <https://www.allaboutbirds.org/guide/search>

## BIRD APPS WITH NESTING INFORMATION

### 1. Audubon Bird Guide by National Audubon Society

The Audubon Bird Guide is a free app with over 800 species of North American birds that you're able to download (~350 mb) for those hikes without a cellular connection available. You can enter bird sightings, see other sightings recorded nearby, and post your bird photos to share with others. The field guide contains bird calls, seasonal range maps, and in-depth data on the different bird species. The field guide section includes nesting information that your kids will find useful for this activity.

**Note:** This app requires your email address.

### 2. iBird Yard+ Guide to Birds by Mitch Waite Group

The iBird Yard+ Guide to Birds is a free app which consists of 270 bird species of North America. This app may not contain all the North American bird species, but it's free, and it's a nice little app that includes the nesting information your kids can use if their bird species is one of the 270 birds in the app.

### 3. iBird Lite Guide to Birds by Mitch Waite Group

The iBird Lite Guide is a free app designed to grow. Check out the 50 common North American bird species included with the app, see if you like what you see, and if you do, you can purchase updates as you get more serious with birding.





## BIRD TRACKING APPS

The following apps are for tracking & reporting only, but they could be useful if you're looking for a follow-up activity for your young ornithologists.

### 1. NestWatch by The Cornell Lab

The NestWatch is for tracking nesting birds and includes an informative and useful Code of Conduct (the Do's and Don'ts of Nest Watching).

**Note:** This app requires you to create an account, but this account will also give you access to Bird Academy, Birds of North America, Celebrate Urban Birds, eBird, Great Backyard Bird Count, Project FeederWatch, and Macaulay Library.

### 2. Merlin Bird ID by The Cornell Lab

The Merlin Bird ID app is a free app that helps you identify over 4,500 bird species from multiple countries by answering a few questions or using a photo of the bird in question. This data is available through downloadable Bird Packs available by region.

**Note:** This app requires your email address.

