



**Title: Bird Nest STEM Challenge**

**Estimated Time: 1-2 periods**

**Core Ideas (GSE Standard and elements):**

**SKP1. Obtain, evaluate, and communicate information to describe objects in terms of the materials they are made of and their physical attributes.**

- a. Ask questions to compare and sort objects made of different materials. (Common materials include clay, cloth, plastic, wood, paper, and metal.)
- b. Use senses and science tools to classify common objects, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, and texture).

**S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects.**

- a. Ask questions to describe and classify different objects according to their physical properties.
- b. Construct an explanation for how structures made from small pieces can be disassembled and then rearranged to make new and different structures.

**S3L1. Obtain, evaluate, and communicate information about the similarities and differences between plants, animals, and habitats found within geographic regions (Blue Ridge Mountains, Piedmont, Coastal Plains, Valley and Ridge, and Appalachian Plateau) of Georgia.**

- a. Ask questions to differentiate between plants, animals, and habitats found within Georgia's geographic regions.
- b. Construct an explanation of how external features and adaptations (camouflage, hibernation, migration, mimicry) of animals allow them to survive in their habitat.

**Literacy Connections: Books**

Make Way for Ducklings, Robert McCloskey  
Duck and Goose, Tad Hills

**Literacy Connections: Close Reads**

Nests Make Nice Shelters – Elementary

**Science and Engineering Practices:**

**Asking Questions and Defining Problems:**

Ask questions that arise from careful observation of phenomena, models, or unexpected results, to clarify and/or seek additional information.

**Developing and Using Models:**

Develop and/or use a model to represent amounts, relationships, relative scales (bigger, smaller), and/or patterns in the natural and designed world(s).

**Crosscutting Concepts:**

**Structure and Function:**

The way an object is structured/designed determines many of its properties and functions.

**Systems and System Models:**

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

**STEM Challenge Overview:**

In this STEM Challenge, your task is to build a **model** nest that can protect and support at least 2 bird eggs or chicks. Just like real birds, you can use a combination of natural and man-made materials to build your nest.

<b>Ask</b>	Ask students if they have ever found or seen a birds nest. If you have one available, pass it around for students to observe. As an alternative, show the students pictures of a variety of nests. Ask students to brainstorm questions that they have about bird nests. Write down and discuss each question briefly.  If time permits, you can show a two minute video that highlights 10 amazing facts about bird nests <a href="https://www.youtube.com/watch?v=IneBlxZn6sg">https://www.youtube.com/watch?v=IneBlxZn6sg</a>
<b>Imagine/Brainstorm</b>	Students <b>brainstorm</b> ideas for how they could design a bird’s nest that could provide protection and support for the eggs and chicks. After brainstorming, they should consider the strengths and weaknesses of each idea.
<b>Plan/Design</b>	In order to learn more about nests, let students read, <i><b>Nests Make Nice Shelters</b></i> . After researching, have students <b>plan</b> and <b>design</b> a model of a nest that will provide protection and support. If time permits, take your students outside and let them collect materials that they think will be good for nest building.  As an alternative, you can provide a variety of natural and man-made materials that they can use in nest construction. Using their chosen materials, students can decide how best to combine them together to engineer a nest.
<b>Create/Test</b>	Students follow their plan, and <b>create</b> their nest. Once they are created, students <b>test</b> their nest in a measureable way to evaluate their effectiveness. Their results should be recorded, organized, and analyzed.
<b>Improve</b>	After discussing and evaluating their results, students improve their solution, redesign their nest, and re-test if possible.

**Teacher Notes:**

Most, but not all, birds lay their eggs in a nest. A nest provides shelter and a nice warm place for the parent birds to care for their eggs and chicks. The nest also helps hide the eggs from predators and it protects them from bad weather and storms.

In this challenge, students take on the role of bird engineers whose task is to to build a strong nest that supports and protects their eggs and chicks. They often use **natural** materials such as twigs, leaves, feathers, grass, and mud to build. But birds will also use any materials that they can find that will help to build a stronger nest. If they live near people, **man-made** materials like paper, plastic, and string are often used along with natural things. For 3<sup>rd</sup> graders, you should also emphasize that nest building is and **adaptation** that helps birds to survive and thrive within their **habitats**.

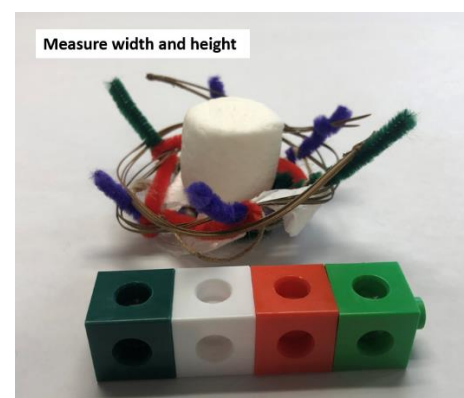
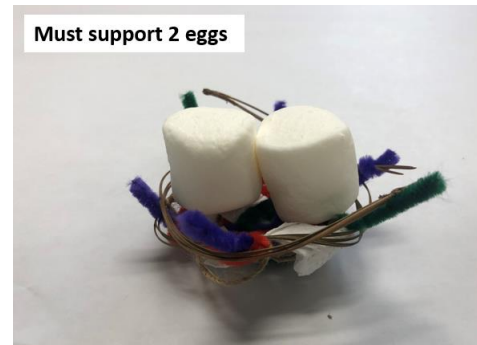
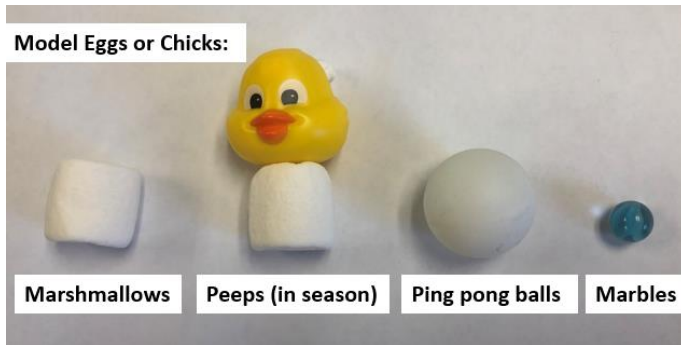
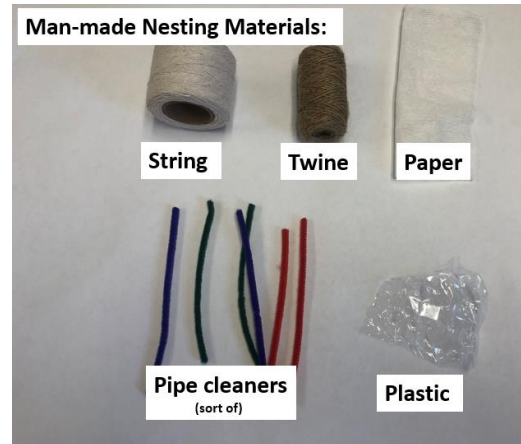
Many birds make nests that are shaped like cups. They weave strands of grass or twigs into a cup shape and then they often line the inside with mud or feathers. Some bird nests are very small like the hummingbirds nest which is often less than one inch across and high. Others, like the bald eagle, make giant nests that can weigh over 5000 pounds.

In this STEM Challenge, the students’ task is to build a **model** nest that can protect and support at least 3 bird eggs (you can use marbles or marshmallows) or Peeps. Just like real birds, we let them use a combination of natural and man-made materials to build their nest (but we pass on the dirt). When time permits, we take them outside and let them collect materials that they think will be good for nest building. Birds usually build their nests from the bottom up but you can leave that up to your engineers.

As an alternative, you can provide a variety of natural and man-made materials that they can use in nest construction. Using their chosen materials, students can decide how best to combine them together to engineer a nest. If you prefer, you can limit them to just natural or man-made materials. Even though pipe cleaners aren't used often by birds, their flexibility makes them a great material to use in this activity.

With respect to science and engineering practices, make sure to emphasize that the nest is a model that helps use to understand patterns of bird behavior. This lesson also provides a great chance to discuss crosscutting structure/function relationships between birds and their nests

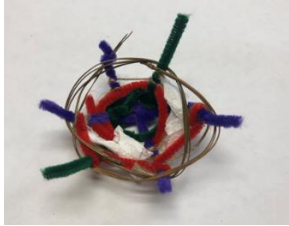
**Suggested materials for students to use: (per group)**



## Vocabulary Cards:

### engineer

to design, build, and improve things



### material

the stuff things are made of



### adaptation

a genetic change that helps an organism to survive



### habitat

the natural home of a plant or animal



### man-made

something created by humans



### model

a 3-D shape of an object

