UNDER CONSTRUCTION

Curious George's Home for Pigeons

Curious George makes friends with a pigeon. He decides to build a "tree" on his balcony as a home for the pigeon, so the pigeon will want to stay.

Key Engineering Concepts

- Structures with a wide base are often more stable.
- A pole can be made stable by "planting" its base in the ground or adding supports around the base.
- Floors and roofs need to be supported. They can be supported by posts or walls.
- Both materials and design are important to the strength of a structure.

Engineering Skills

- Making a plan; drawing a design
- Selecting appropriate materials
- Modifying materials and designs as problems occur
- Discussing ideas and solutions

Materials and Tools: digital camera; chart paper; classroom blocks and gathered building materials such as cardboard boxes (all sizes); pieces of cardboard; paper cups; wrapping paper tubes, yardsticks, or dowels; modeling clay; sand; string; clothespins; newspaper; See Letter to Families for additional materials.

***Curious George* Episodes:** *Curious George's Home for Pigeons* (also available as a book), *Keep Out Cows*

Reproducible Activity Sheets: pages 13–15

Begin the Investigation

Gather supplies. Send home the Letter to Families asking them to collect and send in building materials such as boxes, clean food containers, cardboard tubes, etc. Gather additional supplies yourself. (See Materials on left.) If possible, post pictures of tall buildings in the block corner.

Take pictures. A digital camera can be a powerful tool. Taking photos of their towers allows students to take more risks in their building. Once the photo is taken, they don't need to worry about whether or not the tower falls. Looking at photos side by side helps students compare and reflect on elements that help make a block structure stable.

Developmental Learning
Block building skills develop in stages. Much of this investigation focuses on building towers and apartment buildings. If your students do not have much experience, you may want to first encourage open experimentation with blocks.

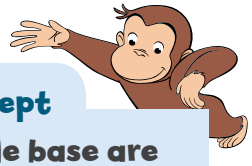
1. **Introduce the story.** Tell students that in ***Curious George's Home for Pigeons,*** George makes friends with a pigeon. He decides to build a tree on his balcony as a home for the bird. Ask: *What things might George find in the apartment that he could use to build something that looks like a tree? What could he use for a trunk? For branches? Why would that make a good branch? What might George use to hold his "tree" together?* Draw a composite picture with the ideas students suggest.

2. **Watch the episode.** Focus attention on the problem-solving process by asking students to notice what George does first to build a home for the pigeon (looks at ideas in a book, observes birds outdoors, sketches his ideas.)

3. **Discuss.** Revisit the end of the video or book so that students can examine George's "tree" more closely. Ask: *What materials did George use to build the trunk and branches of his tree? How did he make his tree stand up and stay together? How does George's tree look similar to the tree we drew? How does it look different? What sort of building tips did you pick up from the "Curious Kids" video segment?*

You may tape Curious George *episodes off-air and share them with children for up to one year. For information on the book version of* Curious George's Home for Pigeons *and the DVD (available in 2007), see page 36.*

Curiosity Lab 1:
Building Tall



Key Engineering Concept

Structures with a wide base are often more stable.

Investigate

1. Observe and discuss.

Show and discuss pictures of skyscrapers or towers (see the books on page 11). Ask: *What do you notice about these towers and skyscrapers? Have you ever been inside a skyscraper? Tell us about it.* Then tell students that they are going to build their own towers or skyscrapers.

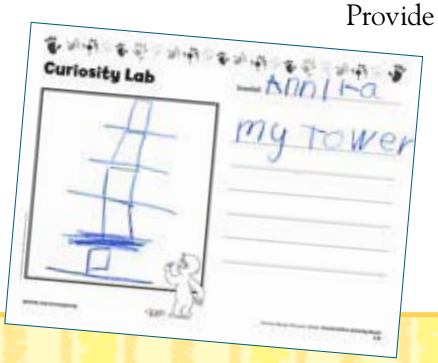
2. Build and explore.

Provide each pair of students with a set of 4–6 blocks or boxes of different sizes. Suggest that students begin by thinking about which blocks to place on the bottom and which to save for the top. Observe students as they work, take photos, and engage them in conversation: *Tell me about your tower. How did you start building it? Why did you start that way? What did you try next? Did you change your mind and try something different? Why?*

If the tower falls over, that's fine. Ask: *Why do you think the building fell over? How can we build it so it is more stable?* If students spontaneously arrange the blocks from biggest to smallest, encourage them to try making a tower with smaller blocks on the bottom. Ask: *What do you notice? Which tower is more stable? Why do you think that is?*

3. Compare and document.

Provide time for students to examine each other's towers. Ask: *What are some things that are different about our towers? What are some things that are the same? What are some of the things you learned about building towers?* Write students' reflections on a Building Tips chart.



4. Swaying towers.

This activity may help children understand that a wide base can make a tower more stable. Have students stand with their feet close together and pretend they are a tall tower. Have them sway from side to side, keeping their legs straight. Ask: *How does it feel? What happens? Is it hard to keep your balance?* Then ask: *How can we move our feet to give our towers a wider base?* (Spread them wider apart.) Have students try swaying again. Ask: *What do you notice? Is it easier or harder to keep your balance now? Why do you think that is? How is this similar to the block towers we built together?*

5. Keep experimenting.

Provide plenty of time for students to build towers using a variety of materials. Emphasize that there are many different ways to build towers and encourage students to examine each other's structures and share ideas. Add new insights to the Building Tips chart. Whenever possible, photograph the students' work. Have students paste a photo of their work on a Curiosity Lab sheet and write (or dictate) about their experience.

6. Stability tests.

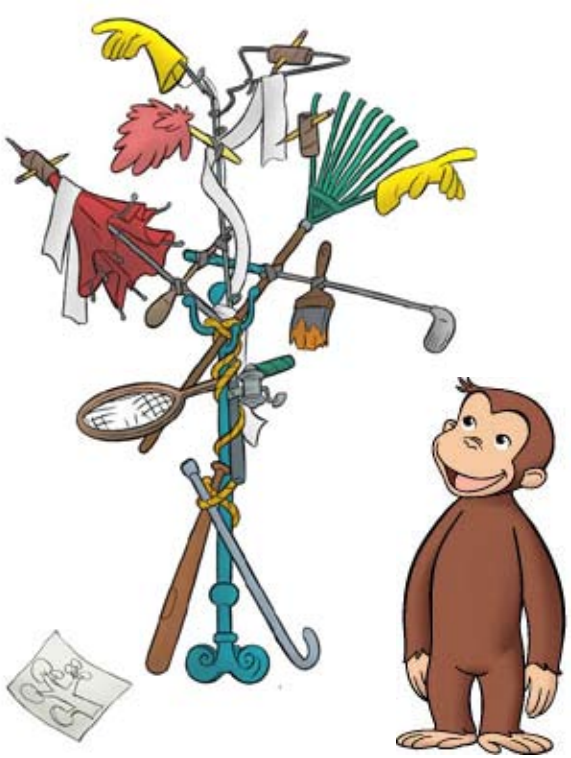
At some point in this unit, you may want students to develop a way to test how stable a structure is. Will the tower still stand if you blow on it, hop up and down near it, lean a yardstick against it, or release a toy car on a ramp and let it roll into the structure? When structures "fail" the test, encourage students to build again, trying new ways to make their building stronger and more stable.

Curiosity Lab 2:

As Straight as a Pole

Key Engineering Concept

A pole can be made stable by "planting" its base in the ground or adding supports to the base.



Investigate

1. Observe and discuss.

Ask students: *How do you think engineers make flagpoles, telephone poles and street signs stand up? How did George get his "tree" to stand up?* Gather ideas, then go outside to investigate. Test to see if the poles and street signs are stable. Look for playground equipment and other structures. Ask: *What do you think helps all these things stand up? Why do you think they don't fall over?* Look at trees and discuss what keeps a tree from falling down.

2. Choose materials.

Back in the classroom, tell students that their challenge will be to make an object stand upright. Give each group a tall object (wrapping paper roll, yardstick, etc.) to start. Ask: *What classroom materials do you think could help you make your object stand up?* Gather suggested materials and add some of your own (clay, play dough, sand, pebbles, plastic containers, cardboard tubes, popsicle sticks).

3. Design and build.

Have each group look at the materials and plan a design. As the groups build, they can modify their design as needed. Circulate and engage the groups in problem-solving conversations. *Why do you think your pole is wobbly? What can you do to make it more stable? Do you want to start over or can you add or change something?*

4. Reflect and compare.

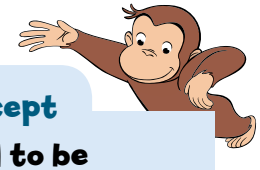
After groups have completed the task, provide time for students to look at other groups' work. Ask: *What do all these structures have in common? What do you think helps them stand up? Which objects were hardest to make stand up? Which objects were easier? What do you think makes the difference?* Add ideas to the Building Tips chart.

5. Document.

Distribute the Curiosity Lab sheet. Take photos of students' creations or have them draw pictures. Have students write about (or dictate) what they did to make their pole stand up. Display the completed Curiosity Lab sheets so the class can continue to study and compare the different engineering solutions.

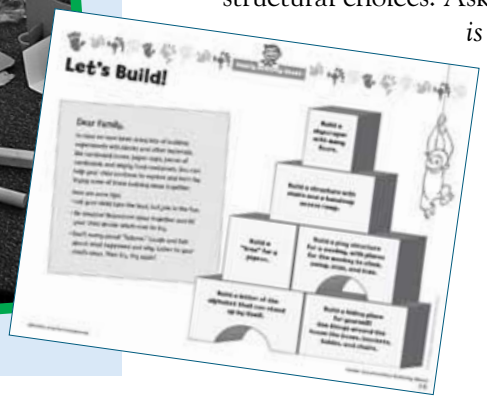
Curiosity Lab 3:

Apartment Buildings and More



Key Engineering Concept

Floors and roofs need to be supported. They can be supported by posts or walls.



Investigate

1. Observe.
Have the students look out the window or go outside to observe and discuss buildings that have several or many floors. Ask: *How many floors are in our school? Where you live? The building across the street?* Have students look at apartment buildings or skyscrapers under construction, or pictures of them in books (see page 11). Talk about how the floors are held up and supported.

2. Build.
Have students create multi-level buildings using pieces of posterboard or cardboard for floors and paper cups, toilet paper tubes, or small blocks for supports or posts. Watch and listen as the students build their structures. How many posts do they use to support each floor? Do they place posts directly above the ones below? If they use cups as posts, are the cups placed rightside up or upside down?

As the students experiment, circulate and ask questions to encourage them to think about these structural choices. Ask: *Do you think your building is stable? Why or why not? What makes it sturdy? How did you figure that out? What else did you try? What could you do to make it more stable?* Some students may be interested in doing stability tests (see Curiosity Lab 1).

3. Discuss and compare.
During the activity, pause so that students can tour the construction site and look at their classmates' buildings. Take photos of the buildings and encourage an exchange of ideas. Ask: *What is the same about our buildings? What is different? What are you learning as you build your apartment house?* Add students' observations to the class Building Tips chart.

New challenges. Encourage students to continue building using a variety of materials. Students can measure the height of their buildings and try to set new records. They can conduct a variety of stability tests on their structures (see Curiosity Lab 1).

Show the "Curious Kids" video clip after ***Curious George's Home for Pigeons.*** Watching these kids experiment with cantilevers, weights, and overhanging ledges may inspire your students to try some new building techniques.

You may also want to present some of the building challenges suggested on the Let's Build! Family Activity Sheet. After trying one or two challenges, send the activity sheet home for students to enjoy with their families.

Curiosity Lab 4: Designing a Wall

Key Engineering Concept

Both materials and design are important to the strength of a structure.

Investigate

1. Newspaper walls.

In the *Curious George* episode ***Keep Out Cows***, George builds walls out of a number of materials. Some of his walls are more successful than others!

Tie a length of string between two tables or chairs—the string should be 1–2 feet from the ground—and let children use clothespins to attach newspaper pages to the line. Ask: *When George made a newspaper wall like this, did it keep the cows away from the flowers? Why not?* (The cows walked through the flapping newspaper.) *Would this wall keep a toy car from getting through?* Test it out by setting up a ramp near the wall and releasing a car from the top of the ramp.

Ask students: *How can we make this wall stronger?* Try out the solutions they suggest, testing each with the toy car. Encourage students to suggest as many different solutions as possible, such as: tape the bottom edge of the newspapers to the floor, place blocks or books on the bottom edge, or build a block wall behind the newspaper.

2. Design and build.

Have students work in groups. Invite them to build the strongest wall they can. The wall should be about as long as a ruler. Display various materials and let groups decide which ones they will use: craft sticks, egg cartoons, clay, play dough, small rocks, pieces of cardboard or poster board, paper tubes, paper cups, etc.

Keep Out Cows

George builds a wall to protect a patch of flowers from grazing cows.

3. Discuss and problem solve.

As the groups work, circulate to watch, listen, and engage the children in conversation. *Tell me about your design. Why did you select these materials? Why did you think they would make a sturdy wall? How did you make them work together? What other materials would make your wall even stronger?*

4. Stability tests.

In the "Curious Kids" video clip after ***Keep Out Cows***, kids are given a design challenge: to build a wall that can stop a rolling toy car. Your students have already tested the stability of a sheet of newspaper. Have them watch the video clip, then help them develop a fair test to compare the strength of the different walls they have constructed (for example, place an identical ramp at the same distance from each wall, and using the same vehicle as the moving force). Let students rebuild or reinforce their walls as needed, then retest. Encourage students to talk about the elements that made their walls strong.

Book List

Nonfiction

Anderson, Jenna. *How It Happens at the Building Site*

Gibbons, Gail. *How a House Is Built*

Hopkinson, Deborah. *Sky Boys: How They Built the Empire State Building*

Morris, Ann. *Houses and Homes*

Simon, Seymour and Nicole Fauteux. *Let's Try It Out with Towers & Bridges*

Wilson, Forrest. *What It Feels Like to Be a Building*

Fiction

Angelou, Maya. *My Painted House, My Friendly Chicken, and Me*

Guthrie, Woody. *Bling Blang*

Hoberman, Mary Ann. *A House Is a House for Me*

Neitzel, Shirley. *The House I'll Build for the Wren*

Tryon, Leslie. *Albert's Alphabet*

Vainio, Pirkko. *The Dream House*

Extend with Literature

Block City
Robert Louis Stevenson

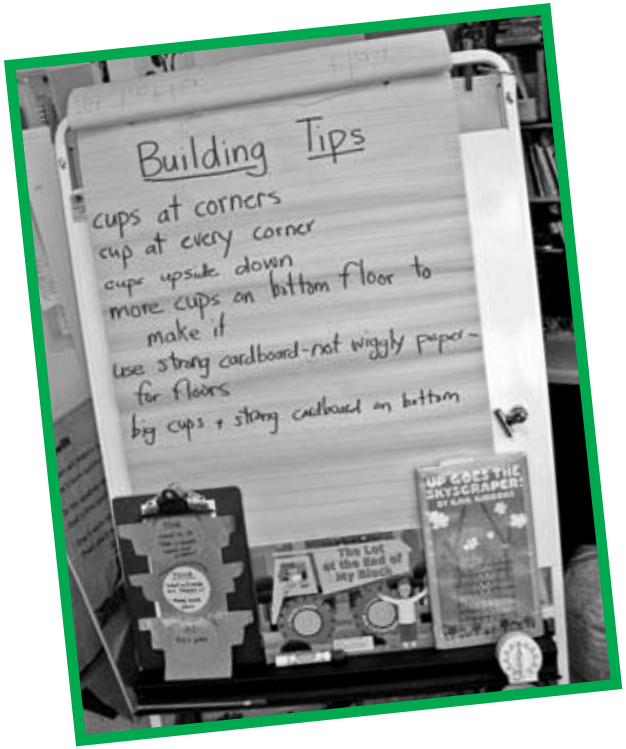
What are you able to build with your blocks?
Castles and palaces, temples and docks.
Rain may keep raining, and others go roam,
But I can be happy and building at home.

Little King Boggen
English nursery rhyme

Little King Boggen, he built a fine hall,
Pie-crust and pastry crust that was the wall,
The windows were made of black pudding and white
And slated with pancakes—you ne'er saw the like!

"Block City" by Robert Louis Stevenson. Write the first verse of this poem on chart paper and read it aloud several times, inviting children to join in when they are ready. Find pictures of castles, palaces, temples, and docks to share with the children. Which place might your students like to build with their blocks? Post the poem in the block corner. Students can decorate the borders of the chart with cutout photos or their own drawings.

"Little King Boggen." Write this nursery rhyme on chart paper and point to the words as you read it several times. Explain that a "hall" is a house. Ask students to imagine what King Boggen's house looks like. Ask: *What material did King Boggen use to make the walls, window, and the slate roof? Do you think the house would be stable? Why or why not? What do you think would happen when it rains?* After discussing this rhyme, children might enjoy making their own edible house out of graham crackers using icing as a mortar to hold the walls and roof together and slating their roof with cornflakes or raisins.



Wrap Up the Investigation

Review, reflect, and expand.

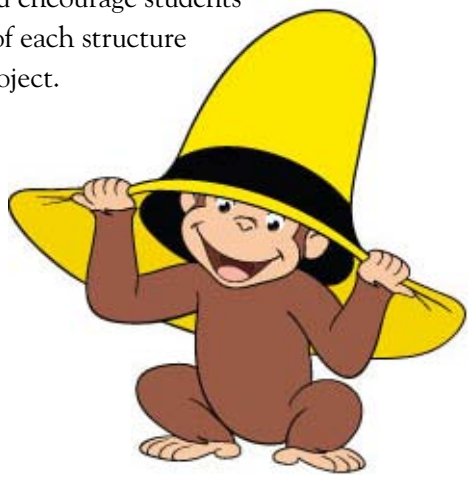
Review the class Building Tips chart and ask: *What was the most important thing you learned about building stable structures? What tips could you give to other kids? What other structures could you build?* Add any new insights to the chart.

Blocks across the curriculum.

Block-building skills and understandings develop and deepen gradually through varied experiences and discussions. Especially if children's interest remains strong, try to continue block building throughout the year and find ways to incorporate blocks into math and social studies. For example, use unit blocks to build familiarity with geometric shapes, their names, attributes and equivalencies (2 triangle blocks = 1 rectangle block). As children learn about houses in different parts of the world, post pictures in the block corner and encourage students to create models of those buildings.

Class project.

Have the children brainstorm something with many parts that they can build as a class: a playground for Curious George, a school, a city, etc. Begin the project by discussing what needs to be built and who will build what. Cover a table or area of floor with a large piece of butcher paper and decide where each piece will go and how big it can be. Have children explain or draw how they plan to construct their piece of the project. Discuss what materials will be needed. Collect them and encourage students to bring items from home. When the project is finished, take a photo of each structure and the entire project. Have children write about their role and the project.



Dear Family,

Over the next few weeks the class will be participating in a unit called "Under Construction." During this time we will be learning how to build structures using blocks and found objects. We need your help gathering materials for our work. Please send in any of the following items:

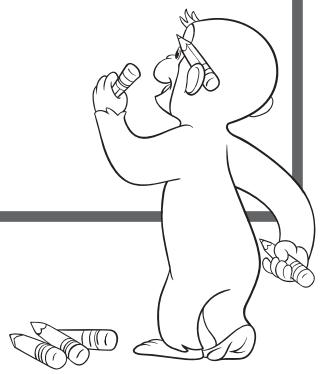
- cardboard boxes, all sizes!
- cardboard tubes from paper towels, wrapping paper, and toilet paper
- flat pieces of cardboard or styrofoam
- egg cartons
- empty plastic food containers
- plastic or paper cups and plates

Please make sure all items have no sharp edges and are clean. Look around your house or work, and send in other materials not mentioned that you think would help us build.

Thank you for your support!

Curiosity Lab

Engineer: _____



Let's Build!

Dear Family,

In class we have been doing lots of building experiments with blocks and other materials, like cardboard boxes, paper cups, pieces of cardboard, and empty food containers. You can help your child continue to explore and learn by trying some of these building ideas together.

Here are some tips:

- Let your child take the lead, but join in the fun.
- Be creative! Brainstorm ideas together and let your child decide which ones to try.
- Don't worry about "failures." Laugh and talk about what happened and why. Listen to your child's ideas. Then try, try again!