

A TEACHER'S GUIDE TO CLASSROOM ACTIVITIES

Skyscraper: From the Ground Up

by Susan E. Goodman, photographs by Michael J. Doolittle

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Skyscraper is a nonfiction book that follows the process of making a building in New York City from the architect's first ideas to the day people move in. It lets its readers put on hard hats and dig a hole a city block wide. Hoist a girder that weighs 82,000 pounds. Build a frame that stretches hundreds of feet into the sky.

Skyscraper was named *Booklist's* Editor's Choice 2004 and *Book Links' Lasting Connection* 2004. It can be successfully integrated into a cross-curriculum program for grades 1-6. The following activities are designed to help develop language, math, and art skills and to build upon the themes of architecture, the effect of natural forces upon human structures, urban planning and community.

City Shapes and Numbers

Get a poster-sized view of New York's skyline or, even better, the skyline of a downtown near your community. Ask students to point out the circles, rectangles, squares, and triangles that make up building shapes and land forms. Then ask them to count the buildings, rivers, bridges, and boats. A more advanced class could sort and graph the number of different shapes found.

Skyscraper Math

Skyscraper is filled with facts and figures that can be used in math lessons at all grade levels. Here are just a few number-filled facts with a few suggested problems:

Page 6: The average hard hat weighs 14 ounces, just under a pound. What part of a pound does an average hard hat weigh? Express your answer as a fraction. Express it as a percentage. Or, when a 150 pound man puts on an average hard hat, how much does he weigh? How about a man who weighs 165 pounds and 10 ounces? How about a woman who weighs 127 pounds and 2 ounces?

Page 12: On this page, a huge crane that can lift 500 tons helps build a new crane that can lift 50 tons. How much more weight can the big crane lift? Express the answer as a fraction. Express it as a ratio.

Page 17: Each year the skyscraper's 21 elevators travel about 30,000 miles. On average, how much do each of them travel? Or, how far is 30,000 miles? Have your students look up different distances—the distance between earth and the moon, for example, or the number of miles to cross the country. Have them use math to compare different distances with 30,000 miles.

Another suggestion: Have students look through the book and create their own math word problems. Solve them together as a class.

Skyscraper Science

Students can learn more about skyscrapers and the forces that act upon them, such as wind and gravity, by going to www.pbs.org/wgbh/buildingbig/skyscraper/index.html.

Then they can take the website's skyscraper challenge at <http://www.pbs.org/wgbh/buildingbig/skyscraper/challenge/index.html>.

Finish the unit with another challenge. Have students split into groups and build the tallest skyscraper they can that supports the weight of a golf ball. They can use any of the following materials: drinking straws, paper clips, newspaper, tape, 4 toilet paper tubes and either salt or sand.

Getting to Know Your School

Have students tour your school, looking at it as a building. Count the number of floors, windows, doors, or steps. Measure the dimensions of the doorways, hallways, stairways. Draw a rough floor plan that locates drinking fountains and bathrooms, and other major spaces like the gym, cafeteria, and library. Walk around the outside of the building, drawing its shape, parking areas, playgrounds, sidewalks, etc.

Use this information to lead a discussion about the design of the building. What words do the children feel best describes the building? Does the physical space inspire certain feelings? What about the materials the school is made of? Are the doorways and hallways too big, too small, just right? What about the placement of drinking fountains and bathrooms? The gym, lunchroom, and library? What is too big, too small, too far away? What is well planned?

Then have your students draw their classroom and explain what they like and dislike about it.

Skyscraper Art and Urban Planning

Collect boxes of all shapes and sizes, from squares and rectangles to odd shapes and oatmeal containers. Cover them with paper and turn them into buildings like skyscrapers or factories, schools, houses, bridges, a sport stadium, restaurants, stores, etc. Students can draw on them and decorate them.

Discuss different ways to lay out your city. Try putting the buildings in a pattern. Talk about the implications of how it is arranged, for example, if houses are placed next to skyscrapers, or an elementary school by a factory or river. When you have decided upon a plan, place the city on a large sheet of paper and sketch in major land features.

Don't forget to name your city!

Skyscraper Writing Skills

Goodman gives big numbers meaning by translating them into something her readers can understand. Instead of just relating the size of the skyscraper's immense basement in cubic feet, she writes, "The hole for the basement is forty feet deep and almost a city block wide—so big that using a garden hose to fill it like a swimming pool would take over four and a half years."

Have students brainstorm to find interesting comparisons that will make the following facts from the book more meaningful. Then, if necessary, have them research to find the information they need to write their sentences.

- Connectors wear 50 pounds of equipment around their waist.
- Together, the pieces of steel in the skyscraper's frame weigh about 12,000 tons.
- The heaviest girder in the skyscraper's frame weighs 82,000 pounds.
- Currently the world's tallest building is in Taiwan. It is 1,667 feet high.

Developing Research Skills

This exercise was taken from directly from Carol Hurst's Children's Literature Site. To see the rest of Hurst's profile of Susan Goodman and other suggested activities for her books, visit <http://www.carolhurst.com/authors/sgoodman.html>.

Increasingly, standardized testing requires that students do expository writing on a given topic. Before examining some of Susan Goodman's individual books with students, take some time to examine the array of her books. Consider her various organizational systems. In **Skyscraper** she uses a chronological approach. Would that work with all her books? Why or why not? If the students' study skills include standard outlining procedures, does any given book of Susan Goodman's fit that organization with main topic and its various subdivisions in a linear manner? Would webbing work better for the organization of a Goodman book? What other approaches or systems does she use? What does that choice do to your interest or lack of interest in the subject?

Together with the students, consider the writing of a nonfiction picture book as a problem solving activity. How would or could Ms. Goodman have gone about her research? Could she have gotten it all from the Internet? How did she know which facts to include in order to make the information interesting? Given what students know about any of her topics, what information would they have included that she did not?

Evaluate the books as reference sources. If you were asked to do a report on this subject, would this Goodman book be a good place to start? What information is unique to this particular book? Which information is available elsewhere? Which of the facts in this book deserve further exploration? Which facts make you want to know more? How does this book differ from an article in an encyclopedia?

Other Ideas:

- To teach perspective and math skills, have students draw a diagram of one floor of their house as seen from above.
- Architecture changes to match our technology and lifestyles. Have a discussion about how we will live in the future and how this will affect our buildings. Then, let your students draw their plans for a future skyscraper or home.
- Have an architect come to the classroom to talk about his/her job.
- Buy 30-gallon paper bag (for yard waste), cut out holes for your students' heads and arms. Let them decorate the bags as a building they know or imagine—using string, aluminum foil, construction paper, etc. to create the doors, windows, and ornamental details. When they are done, they can arrange themselves into a “downtown!”
- Have students write a paragraph about what it would be like to live in a “vertical city,” a building with 70 floors that houses thousands of people.

Contact Information

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