2007

Resources: Building Big (and Small)

Todd R. Kelley
University of Georgia

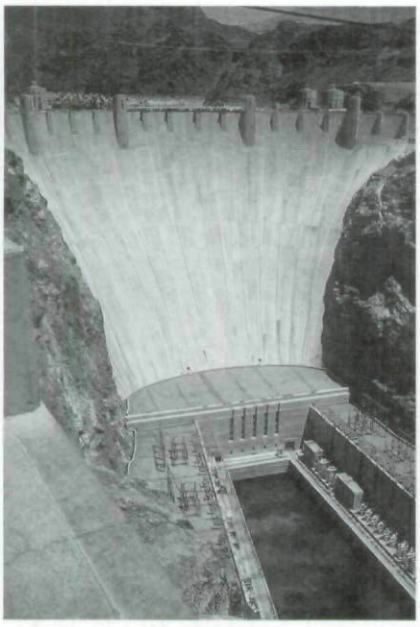
Recommended Citation
Kelley, T.R. (2007). Resources: Building big (and small). Technology and Children, 12(1), 12 -13.

RESOURCES

building big (and small)

introduction

Have you ever been on your way to an exciting vacation only to be stopped because of construction? The construction of a new road, bridge, tunnel, or skyscraper is often hard to ignore—especially if traffic flow is interrupted. Some structures built "big" such as the Golden Gate Bridge, Hoover Dam, Empire State Building, and the Houston Astrodome have become human-made icons of our American landscape. "Building big" takes time and uses huge equipment such as bulldozers, large cranes, and land movers. Building big often requires special resources too, such as steel girders and pre-cast concrete members engineered for such a job. Although the results of big construction may be very common in our everyday lives, few people are aware of how these massive structures are designed and built. This column will feature a set of excellent videos and web resources that could be used in your classroom to help you explore five different structures (bridges, domes, skyscrapers, dams, and tunnels) that have been built "big" to meet our human needs and wants.



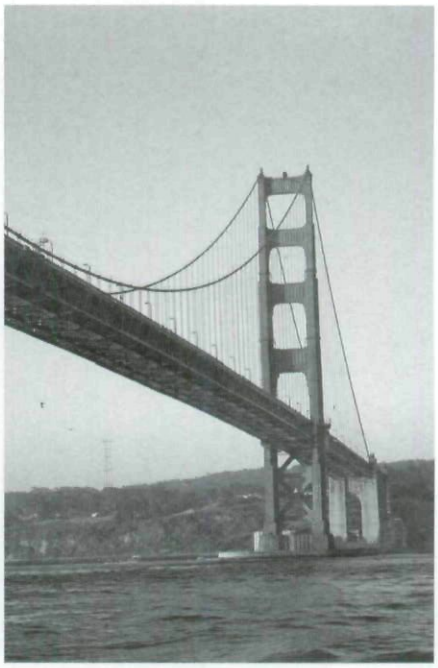
building big resources

The Public Broadcasting System (PBS), along with award-winning author and illustrator, David Macaulay (*The Way Things Work*, 1998), have created a five-part video series highlighting some of the greatest engineering feats of modern times. The miniseries, entitled *Building Big*, highlights the building of bridges, domes, skyscrapers, dams, and tunnels. Ever since humans have been creating structures, they have been conceiving ways to build them bigger and taller. This documentary-style miniseries highlights some of the most well-known big structures that dot our landscape while sharing stories of personal triumph and tragedy experienced by those who had the courage to "build big."

Videos

The *Building Big* video series educates viewers about the design and construction of five different structure types: bridges, domes, tunnels, dams, and skyscrapers. First, *Building Big* explains how bridges are designed and constructed to hold enormous loads. David Macaulay explains some of the basic bridge designs, such as arch, beam, and suspension bridges and how these various designs support a load. Macaulay informs us that, since the Industrial Revolution, the advancement of steel construction allowed engineers to design bridges bigger and to greater expanses. The Brooklyn Bridge and the

by Todd Kelley



Golden Gate Bridge are great examples of building big in different eras.

Domes are interesting structures that have been in existence longer than most people realize. For example, the Pantheon was built by the ancient Romans in 125 A.D. Some modern marvel domes featured in *Building Big* are the Houston Astrodome and Washington, DC's Capital Dome. Go underground to be a mole in Boston's "Big Dig" project to witness the construction of the world's largest tunnel. Travel along with Macaulay to parts of London, France, and Rome to explore early tunnels built centuries ago and witness massive boring machines used to connect France and England beneath the English Channel. Hydro dams help provide electricity to residences and businesses throughout

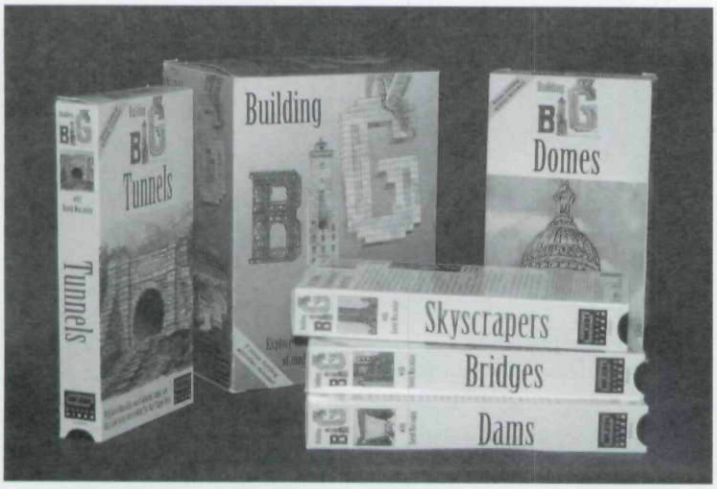
the modern world. However, few people are aware of how engineers design dams to redirect massive rivers. The Hoover Dam, the Aswan Dam in Egypt, and the great Johnstown flood of 1889 are all featured in this segment. Finally, central features to any major city skyline are the massive skyscrapers that serve as home to major businesses, hotel patrons, and apartment dwellers. Famous skyscrapers like the Empire State Building and the Eiffel Tower capture our imagination and cause us to marvel at the technology used to "build big." You will learn how builders keep erecting structures to reach new heights, as demonstrated in Japan's plan to build a new "Supertower." The *Building Big* video series will bring you details of how technology has helped us construct modern marvels and engineer structures to massive heights.

Hands-On Activities

One of my favorite features of the video series is a hands-on component designed for kids called "Building Small." It is a bonus segment highlighted on each video featuring Kenny and Caroline from the hit PBS show ZOOM. Kenny and Caroline present a hands-on activity geared to kids, ages 8 to 13. Building Small activities allow children to explore the building concepts they learned in the video segment by using common household items and basic tools found in the home or school in order to build small models of the featured structure. One such activity guides students in the construction of a geodesic dome made from rolls of recycled newspapers. The finished structure is large enough for a small child to play in. A small brochure insert provides a brief description of the activity, a list of required tools and materials, and an estimated time for construction, as well as tips to implement the activity in the classroom. The Building Small segments have also highlighted parents working with their children to demonstrate the construction of each hands-on activity.

Website

In connection to the Building Small segment, visit **www.pbs.org/buildingbig** for more information about building structures. You will find interactive activities, material labs, additional challenges, and resources for teachers. Through interactive scientific "labs," you will discover how loads, forces, materials, and geometric shapes are critical elements to consider when designing structures. Explore the "Wonders of the World" databank section of the website to find fun facts about the world's most famous "super structures." You will also find additional design challenges around the five structure topics. These challenges teach you more about necessary constraints and criteria to consider when building big structures for a community. These design challenge scenarios also cause students to consider both the positive and negative impacts that are generated when building super structures. Best of all, these challenges can be completed right at your computer desktop. You can also learn about the various domains of engineering through the biographies of ten practicing engineers featured on this website.



Product Information for Building Big Video Series:
http://shop.wgbh.org/product/show/9206

Building Big with David Macaulay
Box Set
Series: Building Big
Grade level: Grade 4+
Closed captioned: Yes
327 min on 5 VHS
List Price: $69.95

Product Information for: Building Big companion book
http://shop.wgbh.org/product/show/8022

Building Big with David Macaulay
David Macaulay
Hardcover; 192 pages; color illustrations
Series: Building Big
Grade level: Grade 4+
192 pps in 1 Book
List Price: $30.00

Todd Kelley *is a Ph.D. graduate student at the University of Georgia in the department of Workforce Education, Leadership, and Social Foundations and a fellow with the National Center for Technology Education. He can be reached at kelley30@uga.edu.*