



Suggested Activities to Complete Before Your Visit

Activities with a Focus on Visual Literacy/the Building Arts

How Has Your Community Changed?
Reading A Building
SkyScraper Statistics
Let's See What It Took to Build the Empire State Building
Getting Permission
Empire State Building Biographies
What's Underneath A City
Paying Attention to Airport Statistics
Across It All



How Has Your Community Changed?

This activity will help students attend to the built world around them in order to see change. Young people tend to think things have always been as they are now. We've found they are often amazed and unaware of changes that have occurred right around them. Focusing on the built environment and how it has changed provides a good, *concrete* opportunity to see change. Learning how to read the built environment is vital in understanding how to plan for future change. This activity enhances visual literacy, temporal concepts and verbal expression.

Activity

Have your students work independently on this activity. Each student should select **10** buildings in the community which he/she will research. The research should include the following:

Find out which buildings in their community existed in 1930.

Photograph these buildings as they are today.

Find out the function of each building in 1930.

Find out the function of each building today.

If there has been a change in the function of a building, find out why this change occurred.

Discuss what is likely to be on each spot 100 years from now. Why?

Take or find photographs of each of the buildings.

Have students report their findings to the class in the form of a newspaper article. Each student is to be a newspaper reporter. He/she has researched 10 buildings in the community and now is to write an article about these buildings and the changes they have gone through since the 1930's. The article should address the information the student gathered by addressing the questions listed above. Accompanying photographs and illustrations should be encouraged.

Engage students in a discussion about presenting factual information versus their personal opinion. Take a look at each of their newspaper articles with an eye on this variable.

Invite a local newspaper reporter to help with this project.

Have student articles and photographs included in the school newspaper.

Students might want to create a blog about the ways in which their community is changing.



Materials Needed

Camera
Paper and pencils for taking notes
Access to a newspaper reporter
Access to the Internet or other research tools

Websites About Evaluating News Articles

1. <http://www.wpunj.edu/library/eval.shtml> --- This site provides information about evaluating a news article one reads but it can be used to as the basis for a discussion for creating a good article.
2. <http://www.westgatech.edu/glr/evaluating.html> --- This site provides an outline of things to consider when evaluating resources.
3. <http://www.star.niu.edu/nina/highschool/write.html> --- This is a good site for the basics of writing a good news article.
4. <http://articles.net.au/Article/Writing-a-Good-News-Article---The-Essentials/11997> --- This is another site with information on how to write a good news article.



Let's See What It Took to Build the Empire State Building

See Student Worksheet C

This activity focuses on temporal concepts and on the economics of the Great Depression. It helps students understand how the way we live our lives depends on the economics of the time. It focuses on the important role the construction of the Empire State Building played in the economy of New York City in 1929/30. It provides information about the many different jobs that were needed to construct early skyscrapers.

Activity

The building of the Empire State Building provided jobs for MANY people during the Great Depression! These jobs enabled many men to provide housing, food and clothing for their families during this difficult time. To give students an idea of just how many jobs were involved have them complete our crossword puzzle of jobs used in the planning and construction of the Empire State Building. **We promise everyone will be amazed!**

There will be some jobs presented in the crossword puzzle that will be unfamiliar to students. Have them try to guess what the function of these jobs might be before completing the puzzle. Then let them try the puzzle and see how they do.

After completing the crossword puzzle discuss all the jobs presented in the puzzle and try again to determine the function of each job. There are several good children's books that explain these jobs (see the resource section below).

Have students simulate some of the more interesting jobs used to build the Empire State Building --- such as the *bucker-up*.

Present your students with several original photographs of the construction of the Empire State Building. These photographs will lend themselves to many interesting topics of discussion. A few of these are:

1. Working conditions then versus now.
2. Where are the female workers?
3. What were the wages in 1929/1930?
4. Who were the workers? What were their backgrounds?
5. How many people worked on building the Empire State Building
6. Safety issues?
7. Who took these photographs and how?

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Materials Needed:

Student Worksheet: *We Built the Empire State Building, A Crossword Puzzle* (LINK C)
Original photographs of the construction of the Empire State Building
Props for simulating jobs

Resources for Photographs of the Construction of the Empire State Building

1. <http://www.greatbuildings.com/cgi-bin/glk?http://www.nypl.org/research/chss/spe/art/photo/hinex/empire/empire.html> --- This link takes you to the New York Public Library website. They have some incredible photos of the construction of the Empire State Building! They also have information and photographs of Lewis Hine, the photographer who took many of these incredible photographs documenting the building's construction.
2. <http://www.skyscraper.org/home.htm> --- This is the website for the Sky scraper Museum. They have wonderful information about the construction of the Empire State Building and the thinking of the time.
3. http://www.encyclomedia.com/empire_state_building.html --- This site has a really good audio and video presentation about the construction of the Empire State Building as well as printed copy.

Books for More Information About the Construction of the Empire State Building

1. Burns, Ric and Sander, James with Ades, Lisa. **New York An Illustrated History**. Alfred Knopf: New York, 1999
2. Craats, Rennay. **Structures, Style and Building**. Raintree: Chicago, 2004
3. Goodman, Susan and Doolittle, Michael J. (photographs). **Skyscraper**. Alfred Knopf: New York, 2004
4. Holland, Gini. **Great Buildings: The Empire State Building How It Was Built and How It Is Used**. Raintree Steck-Vaughn Publishers: Austin, TX, 1998
5. Homberger, Eric. **New York City --- A Cultural and Literacy Companion**. Interlink Books: New York, 2003
6. Macaulay, David. **Unbuilding**. Houghton Mifflin: Boston, 1980
7. Mann, Elizabeth and Witschonke, Alan, Illustrations. **Empire State Building**. Mikaya Press: New York, 2003
8. Marshall, Bruce. **BUILDING NEW YORK The Rise of the Greatest City on Earth**
9. Milo, Francesco and Cecchi, Lorenzo, Illustrator. **Master of Art The Story of Architecture**. Studio Galante, Andrea Ricciardi Peter Bedrick Books: New York; printed in Italy, 1999
10. Schoener, Allon. **New York An Illustrated History of the People**. WW Norton & Company: New York, 1998
11. Sullivan, George. **Built To Last Building America's Amazing Bridges, Dams, Tunnels and Skyscrapers**. Scholastic Nonfiction: New York, 2005

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Getting Permission

In this activity students learn about a part of New York City's history that has affected the built environment all over the United States. It requires that students take a look at the city's zoning requirements and speculate what this meant for the built environment there. In a later activity, to be completed on-site in New York City, students will be asked to read the built environment as it relates to these zoning laws.

Activity

Permission to build is called a permit. Sounds easy, right? Like "Please may I build a building right here on this piece of land?" But nothing could be further from the truth! Permits are based on **zoning** regulations and laws. These zoning regulations define how large buildings in a city can be and how these buildings can and cannot be used. In addition, the laws that frame permits can limit or expand what and how a building can look

Here is one of the zoning regulations/laws that greatly affected the design of the Empire State Building and many of its neighbors:

In 1916 New York City was the first city in the United States to create a city-wide Zoning Resolution. This was done as a reaction to the construction of the Equitable Building (120 Broadway). The building was so much taller and bigger than its neighbors that it blocked the windows of these buildings, diminishing the availability of sunshine and fresh air for the people who lived and worked in them

Have students collect all the drawings and photographs possible of the Empire State Building and surrounding buildings and try to determine what affect this law had on the building of these buildings.

*The **Zoning Resolution of 1916** established height controls and required that New York buildings have setbacks (sort of like a wedding cake) to allow sunlight and air to reach the street below). It also divided the city into use districts (residential, business, retail, and unrestricted), area districts, and height districts*

Here is another zoning law that affected the buildings in New York City. Have students study it and discuss the affect they think it had on the city.

In 1961 the city changed these zoning regulations and setbacks were no longer required. Buildings constructed in New York City after this date had more open space inside and could be the same size from street to roof.

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Have students bring all their guesses with them when they visit the Empire State Building and its neighbors. This will be their opportunity to see the effects of these two laws first hand.

Materials Needed

Photographs of the Empire State Building and its neighbors
New York City Zoning Laws 1916 and 1961

Websites for Information About Zoning

1. <http://www.nyc.gov/html/dcp/html/zone/zonehis.shtml> --- This is the Website of the New York City Department of City Planning. It's chocked full of information!
2. http://www.tenant.net/Other_Laws/zoning/zontoc.html --- This site provides a handbook for understanding New York City zoning.
3. <http://www.nytimes.com/2007/03/14/realestate/14GH-Home.html?ex=1331524800&en=ad739d7664c2dc40&ei=5088&partner=rssnyt&mc=rss> --- This is a link to an interesting article about zoning variances that appeared in the New York Times in March, 2007. It gives some zoning issues to ponder.
4. <http://www.nyc-architecture.com/LM/LM059.htm> -- This website has photographs of the Equitable Building at 120 Broadway.
5. <http://www.greatgridlock.net/NYC/nyc1a.html> -- This link provides information about several of Manhattans early skyscrapers.

Websites for Photographs of New York Skyscrapers

1. <http://www.petergof.com/nyc/skyscrapers.htm> --- This site has photographs for many of New York City's modern buildings that allow the viewer to easily see the effects of zoning regulations.
2. <http://www.greatgridlock.net/> --- You have to drill down a bit but if you persist you're rewarded with some nice photographs of New York skyscrapers as well as some information about each.
3. <http://www.wirednewyork.com/skyscrapers/> --- This site has photographs of New York buildings as well as information about the architects who designed them.
4. <http://www.mcnyc.org/> --- This is the official site of the Museum of the City of New York.
5. http://www.skyscraper.org/home_flash.htm --- This is the official site of the Skyscraper Museum in New York City. It has lots and lots of good information about skyscrapers.

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Empire State Building Biographies

The purpose of this activity is to introduce students to some of the men who were responsible for the planning and construction of this famous skyscraper. By studying their contributions students will gain an understanding of and appreciation for the role that careful planning and organization play in the creation of the built environment.

The activity also attempts to broaden the students' information about the time period. It adds music to the mix and asks students to associate this music with the events of the Great Depression and to the actual building of the Empire State Building. Students are called on to make associations across disciplines to accomplish this task.

Activity

The building of the Empire State Building was an incredible feat! Here are some of the people who were involved in its creation. Each contributed a great deal of skill, knowledge and hard work:

- Al Smith --- Official Boss
- John Jacob Raskob --- Raised the money
- William Lamb --- Designing Architect
- Rambush Studios --- Responsible for the interior design
- Bassett Jones --- Mechanical Engineer
- Starrett Brothers & Eken --- Headed construction
- John Bowser --- Job Superintendent
- Elisha Otis --- Invented the elevator
- Henry Bessimer --- First created steel
- Nick Acson --- Marble cutter
- H.G. Balcom & Associates --- Structural Engineers

Have each of your students extensively research **one** of these men and present a report to the class describing how he was involved with the building of the Empire State Building. **The report should be presented in the first person. The student should become the character researched.**

After presenting the report, have each student sum up his/her report by choosing three (3) succinct words to describe the person he/she researched/portrayed.

After hearing all the reports have students discuss the value of each person to the building of the Empire State Building and whether any person's job could have been eliminated from the process. Why or why not? If a student feels a person could have been eliminated, find out why the student chose this position for elimination?



Present students with music from the 1930's. Have them listen and think about how this music relates to the building of the Empire State Building:

- Can you feel the building going-up in the music?
- Can you feel/hear the air on the steel beams high up on the 86th floor?
- Does the music give you a picture of the construction workers?
- Do you hear happiness or sadness in the music?
- Do you feel hope or despair in the music?
- What about the rhythm?
- Think of ways that an orchestra is like the building of the Empire State

Here are some of the composers and their music that might be fun to explore for this task:

- Duke Ellington --- *It Don't Mean a Thing (if it Ain't Got That Swing)*
- Woody Guthrie --- *I Ain't Got No Home*
- Cole Porter --- *Anything Goes, Begin the Beguine*
- George and Ira Gershwin –
- Ethel Waters --- *Stormy Weather*
- Bing Crosby --- *Brother Can You Spare A Dime*
- Irving Berlin
- The Mills Brothers --- *Tiger Rag*
- Bernnie Meroff & his Orchestra --- *Happy Days Are Here Again*
- Johnny Mercer
- Richard Rodgers
- Cab Calloway & His Orchestra --- *Minnie the Moocher*

Big Band Leaders

- Benny Goodman
- Duke Ellington
- Glenn Miller --- *Moonlight Serenade*
- Tommy Dorsey
- Artie Shaw

Materials Needed

- Music from the 1930's
- Access to the Internet or other research tools
- Photographs of the construction of the Empire State Building

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Good Web Links for Photographs of the Construction of the Empire State Building:

1. <http://www.greatbuildings.com/cgi-bin/glk?http://www.nypl.org/research/chss/spe/art/photo/hinex/empire/empire.htm> --- This link takes you to the New York Public Library website. They have some incredible photos of the construction of the Empire State Building
2. http://www.skyscraper.org/WEB_PROJECTS/VIVA2/viva2_intro.htm --- This is a link to the website of the Skyscraper Museum. may use.
3. <http://www.nyc.gov/html/thegates/html/artists.html> --- This is a link to a kit for building your own Empire State Building and other tall buildings.

Websites for Music from the 1920s, 1930s, 1940s:

1. <http://www.fortunecity.com/tinpan/parton/2/depress.html> --- This site has a list of lots of great songs from the Great Depression era.
2. <http://www.dismuke.org/Electric/index.html> --- This is a private citizen's website of vintage music. It has information about the music as well as sound clips.
3. <http://www.collateralworks.com/vmp.html> --- This site lists songs and musical arrangements from the 1920s and 1930s but there is not audio component.
4. <http://www.authentichistory.com/1930s/index.html> --- This site has audio clips of music from the 1920, 1930s and the 1940s as well as other primary sources from these years.
5. http://www.pbs.org/jazz/time/time_depression.htm --- This is part of the PBS website. It presents content and audio excerpts from Ken Burns' film ***Jazz: A History of America's Music***.



Reading A Building

The focus of this activity is the use of visual literacy skills. It introduces students to the concept of architectural or building components and helps them begin taking note of these components on/in the built environment in their own community. In this activity students will specifically be introduced to the elements of the Art Deco period of architecture.

Activity

New York has so many interesting buildings to investigate. Before your visit to New York City your students should practice reading buildings and learning what they have to say. This can be done by exploring some of your community's most interesting buildings. Here are a few ways we suggest you have students do this:

Tour your school noting and discussing the architectural or building components you see. After you've completed your tour, check with your building supervisor to make sure you found ALL the details of the building. We're betting you'll miss a few --- like the gutters! Create a master list of all the architectural components students found in the school. Discuss whether all buildings in your community have these exact same details. How about the buildings in your community at the time it was founded? Which architectural details might have been around then and which ones might have been added later? What components/details might not be used in the future?

Help students make a list of the architectural components they **expect** to find when they explore the Empire State Building and other buildings in Manhattan. While they are in New York City they will be asked to generate another, similar list of what they actually discover. They will then be asked to compare and contrast the two lists.

Invite an architect into your classroom to help students understand the breadth of planning that must occur in order to construct a building. If possible have on hand a copy of the actual plans used for building your school. Have the architect look-over the students' list of the architectural components in their school. Discuss this list to find out if the architect has encountered any schools that do not have these components or that have different components.

Invite other tradesmen to come into your classroom and discuss the specific building components with which they work --- plumbers, engineers, Masons, etc. Have students discuss the list of architectural components in their school with the tradesmen.



Have your students research the style of architecture referred to as *Art Deco, Modernistic or Style Modern* design. This is the design they will see in the Empire State Building. Ask them to bring in photographs or drawings of Art Deco buildings, furniture or art objects. Have them focus on searching for Art Deco examples with interesting patterns made by *zigzags, trapezium, curves and broken lines*. They should also look for interesting uses of aluminum and stainless steel.

Display Art Deco items and photographs in your classroom.

Have students bring in samples of music (vintage or modern) they consider expresses the same lines or rhythm (music-wise) as the Art Deco style of architecture.

For extra credit --- have students find out what a *ziggurat* is!

Materials Needed

- Building plans for your school (if possible)
- A local architect who will work with your students
- Local building tradesmen who will work with your students
- Photographs of Art Deco buildings, furniture and art objects
- Access to the Internet or other research tools

Good Websites for Information About the Art Deco Style

1. http://www.behr.com/behrx/inspiration/historical_4.jsp -- This is the Behr Paint Company's website. It has some good information about materials and colors and trims that were part of the style.
2. <http://www.artdecohomes.com/> --- This website shows one architect's Art Deco designs. Some are way-out but all are interesting!
3. <http://artstyleonline.com/design/life-in-art-deco-style/> --- There is not much information here but there are some clear examples of Art Deco buildings, furniture and art objects.
4. <http://artstyleonline.com/design/life-in-art-deco-style/> --- This page is devoted to the ziggurat.



What's Underneath A City

This activity requires students to think about the importance to their lives of what's underneath a city --- all those systems that make their daily lives run smoothly. Students are asked to research and learn about the science of these systems and about the people that make them work. They will explore systems in New York City and within their own communities.

Activity

www.water-technology.net --- the website for the water industry has this to say about New York City's Tunnel No. 3 project to improve the water supply to the city:

New York's City Tunnel No. 3 is one of the most complex and intricate engineering projects in the world. Constructed by the New York City Department of Environmental Protection, the tunnel will eventually span 60 miles and is expected to be complete by 2020.

The size and length of the tunnel, its sophisticated control system, the placement of its valves in special chambers, and the depth of excavation, represent state-of-the-art technology. While City Tunnel No. 3 will not replace City Tunnels No. 1 and No. 2, it will enhance and improve the adequacy and dependability of the water supply system and improve service and pressure to outlying areas of the city. It will also allow the DEP to inspect and repair City Tunnels Nos. 1 and 2 for the first time since they were activated.

In this activity students will research and learn about the requirements and complications of this project.

Begin by presenting students with a map of the total path of Tunnel #3. Compare the path of the tunnel with a general land map of New York City making sure students understand what is above ground and around the route of the tunnel.

Present the following questions to students for research and discussion. Not all are as easy as they may seem:

1. Describe the equipment that is needed for the construction of Water Tunnel No. 3. (Don't overlook anything!)
2. List all the jobs needed to complete the construction of Water Tunnel No. 3. (Think hard!)
3. Find out and describe just what a water tunnel looks like. You may draw it if you would like.
4. Describe the function of a water tunnel.
5. Find out how climate change—sea level rise, higher temperature, increase in extreme events, and changing precipitation patterns affects New York City's water supply.
6. Describe New York City's very first water supply system.

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7. Find out what The Manhattan Company (a bank) has to do with the City's water supply.
8. At this point, when is Water Tunnel No. 3 predicted to be completed? How much is the current budget and what will the total length of the tunnel be? If the projects remains on schedule, how long will it have taken to complete the project?
9. Find out who the *sandhogs* are.
10. Find out what a *mole* is.
11. Describe the work that goes on in Tunnel No. 3 **daily**.
12. Find out what company has the contract for Water Tunnel No. 3 and contact them with questions about the project.

Compare and discuss the results from students' research. You may want to record these results in chart form for all to see.

Compare and discuss the equipment used and the jobs needed to complete Water Tunnel No. 3 under New York City with those used and needed for the construction of the Empire State Building, in the sky above the City.

Compare and discuss the different methods of research students used to address the questions above. Which methods worked best? Why?

Have students invite an official from their local community's Environmental Protection Agency or local water and sanitation provider into the classroom to discuss the water supply and waste management in their community.

If possible have students trace the local water supply system on a map of their community.

Discuss ways that citizens can help protect and conserve their water supply.

Materials Needed

Map of New York City showing all Boroughs

Map of the Tunnel No. 3 Project

Access to the Internet or other research tools

An official from the agency providing water and waste management services to your community.

Map of your local community.



Good Websites About New York City's Water Tunnel No. 3:

1. <http://www.atlasmagazine.com/photo/sacha6/p09.html> --- This is a cool site with information about what's underneath New York City
2. http://www.amny.com/news/local/am-tunnel-story_0,1627108.story --- Check out this site for everything you ever wanted to know about New York City's Water Tunnels.
3. http://www.water-technology.net/projects/new_york/ --- This site is all about New York City's Water Tunnel #3 project. It's fascinating! It's a good site for getting a map of the project.
4. <http://www.popularmechanics.com/science/earth/1484317.html?page=2> --- This website has an article about Water Tunnel No. 3 and a good, very simple drawing of it. It also has photographs of the *Sandhogs*.



Paying Attention to Airport Statistics

This activity focuses student attention on airports, an important part of a transportation system that affects life and work in a community. It uses air traffic statistic and mathematics to get a beginning idea of the extent to which the demands of air travel affect a community.

Activity

Present your students with photographs of JFK Airport, LaGuardia Airport and Newark Airport, the three airports that serve New York City and with photographs of the airport closest to your school. Locate the New York airports on a map of New York City. Locate the airport closest to your school on a local map.

Have students discuss how they think life in a community that **does not have** an airport is different from life in one that **does have** an airport.

Prepare your students to compare the three airports that serve New York City to each other and to their own, local airport. Here are some variables for comparison:

1. The number of runways in the airport.
2. The length of each runway.
3. The thickness of each runway.
4. The width of each runway.
5. The average number of departing flights in a day.
6. The average number of passengers on each departing flight in a day.
7. The number of bags each passenger is allowed to check for a departing flight.

Here are the problems to be addressed using these statistics:

- What is the total length of the runway (in feet) at each airport? What difference does this length make to the airport and to the surrounding community?
- What is the total amount of material (probably concrete) that went into constructing the runways for each airport? What difference does the amount of material used make to the surrounding community?
- What is the average number of bags checked at each airport on a given day? What difference does the number of bags make to the airport and to the surrounding community?

Interesting Additional Research

Find out how each airport got its name.



Take a look at the future plans for each airport.

Contact the company that built each airport and ask them the hardest issue they had to deal with during the construction of the airport.

Materials Needed

Photographs of JFK Airport, LaGuardia Airport and Newark Airport
Map of New York City
Map of your community
Photographs of your local airport
Access to the Internet or other research tools

Good Websites for Learning About Airports

1. <http://www.faa.gov/arp/> --- This is the FAA's website. It provides information about airports, airport construction, airport safety, environmental issues, useful data, etc.
2. <http://travel.howstuffworks.com/airport.htm> --- This website has great, easy to understand explanations about all kinds of things that relate to airports --- construction, traffic, passengers, managing the airport, etc.
3. <http://www.tsa.gov/index.shtm> --- This is the website of the Transportation Security Administration with the Federal Government. It has useful information about airport security, training, incidents with travelers, screening tips, etc.
4. <http://www.airnav.com/airports/> --- This site has lots of information about different airports and how they function.
5. <http://www.landings.com/landings/Pages/airports.html> --- Go to this site for aviation news.



Skyscraper Statistics

The purpose of this activity is to introduce students to skyscrapers around the world and to use common statistics as a means of making comparisons among these buildings.

Activity

The Empire State Building is just one of many skyscrapers that exist in the world today. Here are some of its most interesting statistics:

The usual statistics

- It is 1,472 feet in height to the top of the antennae.
- It is 1,250 feet to the 102nd-floor observatory.
- It has a volume of 37 million cubic feet.
- The area of the site it occupies is 83,860 square feet.
- The cost of construction of the Empire State Building was \$40,948,900.
- At 102 floors it surpasses the Chrysler Building in height.

Some unusual statistics

- There are 210 steel columns in the vertical frame.
- About seven million man-hours of labor were involved in the construction.
- 3,439 workers were employed on Thursday, April 14, 1930. This was the day the greatest number of workers were on the job.
- It requires a cleaning staff of 250 to keep it in shape.
- It takes one man a full day just to replace the burned out lightbulbs in the tower alone.
- It has 63 elevators.
- It has 75 miles of water pipes.
- It has 50 miles of radiator pipes for heating.
- It has 64 elevators.
- It has 6,500 windows.

(From *Thirteen Months to Go* by Geraldine B. Wagner)

Discuss these statistics as a class.

Present photographs of the buildings below and have your students find out some of the **usual statistic** for these buildings:

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- Etionas Towers in Kuala Lumpur
- Jin Mao in Shanghai
- Taipei 101 in Taiwan
- Freedom Tower
- Burj Al Arab in Dubai, United Arab Emirates

Have your students graph the buildings above, along with the Empire State Building, based on their heights. Discuss the graph. Don't forget to include a discussion about why our society builds these skyscrapers.

Then have your students find some of the **unusual statistics** for the buildings above.

Materials Needed

Access to the Internet or other research tool

Graphing supplies

Photographs of

- Jin Mao in Shanghai
- Taipei 101 in Taiwan
- Etionas Towers in Kuala Lumpur
- Freedom Tower
- Burj Al Arab in Dubai, United Arab Emirates

Useful Websites for Locating Photos of & Information About Skyscrapers

1. <http://www.emporis.com/en/> -- A great site for locating buildings around the world.
2. <http://skyscraperpage.com/> --- This site has lots of information about skyscrapers all over the world. It even has up-dated information about buildings currently under construction.
3. http://www.skyscraper.org/TALLEST_TOWERS/tallest.htm --- This is the website for the Skyscraper Museum. It has lots of information about tall buildings all over the world and also about visions for and construction of skyscrapers.

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Across It All

This activity focuses on bridges, their design, their construction, and their importance to a society. It uses the four (4) New York bridges that cross the East River from Manhattan to the outer Boroughs as teaching tools. It also uses bridges in the students' own community as teaching tools.

Activity #1

Begin by having your students define a *bridge*. Here is a definition that is commonly used: *A structure spanning and providing passage over a gap or barrier such as a river or a roadway.* (From The American Heritage Dictionary)

Have students name ALL the bridges in their community. Then see if they can describe each. Students that are so inclined should be encouraged to sketch as many of these bridges as they can.

Ask students if they are sure they have ALL the bridges in their community. What about places where water just runs under the road? Is this a bridge? It fits the definition. Have students go back and refine the definition of a bridge. They may need to add something about size and function.

Below are the 4 basic bridge types. Present students with photographs of each of these types of bridges:

1. Beam
2. Truss
3. Arched
4. Suspension (the term cable-stayed may be used as well)

Have students research and define each type of bridge and then draw it. Display their drawings in the classroom.

Once students have a refined definition of a bridge, understand the 4 main types of bridges and have a working list of the bridges in their community, have them decide what type of bridge each bridge in their community is.

Discuss what each bridge in their community connects and why this connection is important.

Have students research and discuss what was happening in their community at the time each bridge was built and then decide if or how these events related to the building of each bridge.

Create a list of other meanings of the word *bridge*.



Make a list of songs with the word *bridge* in the lyrics.

Create a gallery in the classroom for photographs or drawings of bridges in your students' community.

Activity #2

Since New York was first settled there have been many men who have offered visions for bridges crossing New York's East River and Hudson River. This activity calls for students to explore some of the more interesting visions for these bridges.

Present your students with the names of the following men:

Colonel John Stevens
Thomas Pope
Gustav Lindenthal

Have students select one of these men and research his vision for a New York City bridge. After completing their research ask students to discuss their visionary with the class and give their opinion about his envisioned bridge.

Activity #3

This activity presents students with the opportunity to learn more about four (4) major bridges that connect Manhattan with the Boroughs across the East River.

Present your students with several photographs of these 4 major New York bridges that cross the East River:

The Brooklyn Bridge
The Manhattan Bridge
The Queensboro Bridge
The Williamsburg Bridge

Have students research each bridge and decide what type of bridge each is and why this type of bridge was selected. Then they should compare each of these New York bridges to the bridges in their own community.

Make sure you have photographs of each of these New York bridges for your students' use.



Have students select one of the New York bridges. Their task is to redesign **one** of these bridges using Photoshop or a similar computer program. They should create this new design by incorporating parts of the other 3 types of bridges into the photograph of the New York bridge they selected for redesign.

After students have completed their redesign have them describe why their newly designed bridge is better or worse than the original bridge. They should focus on its function, its construction and its aesthetics.

Activity #4

After students have completed their research for Activity #1, Activity #2 and Activity #3 write the following words on the board in a scrambled fashion. Have students sort out the items listed that go together and then explain their pairings:

(An item may have more than one pairing)

59 th Street Bridge	Brooklyn Bridge	The Eiffel Tower
Suspension bridge	Sandhogs	Queensboro Bridge
Mr. Roebling	Largest East River bridge	Manhattan Bridge
Youngest East River bridge	Williamsburg Bridge	Cantilevered Bridge

Discuss the pairings students made.



Material Needed

Map of your local community that includes bridges
Photographs of the 4 main types of bridges
Photographs of the Brooklyn Bridge, the Williamsburg Bridge, the Queensboro Bridge and the Manhattan Bridge in New York City
Access to the Internet or other research tools
Photoshop
Space in the classroom for a gallery of photographs
The City That Never Was by Rebecca Read Shannon

Good Websites About Bridges

1. <http://www.brantacan.co.uk/advancedbridges.htm> --- This site has everything you would ever want to know about bridge design and how the different designs work.
2. <http://pghbridges.com/basics.htm> --- This site has information about different types of bridges and how they are constructed.
3. <http://www.faculty.fairfield.edu/jmac/rs/bridges.htm> --- This site focuses on the geometry of bridges.
4. <http://bridgepros.com/> --- Everything about the history of bridges. This is sort of a messy site but we do like their Bridge Quiz section and their section on Bridge Projects.
5. <http://www.pbs.org/wgbh/nova/bridge/> --- This is site of a very good video on bridges and bridge building!
6. <http://www.nyc.gov/html/dot/html/bridges/bridges.shtml> --- Great site about New York City bridges.
7. <http://www.newyorkled.com/photobridges01.htm> --- Nice photos of New York City bridges.
8. <http://www.nyc.gov/html/nyc100/html/classroom/photos/index.html> --- Great photos of New York bridges!

Books

Shannon, Rebecca Read **The City That Never Was** (New York, Penguin Group, Viking Press, 1988)

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