The Great Chicago Fire

How did the Great Chicago Fire of October 1871 change the way people designed and constructed buildings in the city?

This lesson assumes that students already know the basic facts about the Chicago Fire. The lesson is designed to help students think about what happened after the fire died out and Chicagoans started to rebuild their city.

Theme

This lesson helps students investigate how the fire resulted in a change of the construction methods and materials of buildings. By reading first-hand accounts, using historic photographs, and constructing models, students will see how the people of Chicago rebuilt their city.

Student Objectives

- write from the point of view of a person seen in photographs taken shortly after the Great Chicago Fire
- distinguish between fact and opinion
- differentiate between a primary source and a secondary source
- discover and discuss the limitations and potential of load-bearing and skeleton frame construction methods
- respond to questions and make inferences about the growth of the American skyscraper and its connection to inventions from the industrial era

Activities

- observe, analyze, and interpret two well-known historic Chicago photographs
- build models of pre-fire and post-fire buildings using the two different construction methods
- interpret a graph to understand the change (and reasons for the change) in building heights after the fire

Type

- indoor, desktop activities
- *optional:* field trips to important Chicago Fire sites

Timeframe

five class sessions of 40 minutes each

Materials

- approximately 20 wooden blocks, 20 small boxes, or 20 sugar cubes *(per small student group)*
- two bags of stale mini-marshmallows and several boxes of toothpicks; or a set of Tinker Toys®
- roll of aluminum foil
- **Handout A** - K-W-H-L chart
- **Handout B** - photograph of the Water Tower from post-fire Chicago

Vocabulary

load-bearing method a method of construction where bricks that form the walls support the structure

skeleton frame system a method of construction where a steel frame acts like the building's skeleton to support the weight of the structure, and bricks or other materials form the building's skin or outer covering

story floors or levels of a building

conflagration a large destructive fire

point of view trying to imagine how another person might see or understand something

primary source actual records that have survived from the past, such as letters, photographs, census data, oral histories, and maps

secondary source memories of the past created by people recalling the events some time after they happened; secondary sources use primary sources to create a story through writing, film, lectures, or exhibits; projects completed by students are examples of secondary sources

fact something that actually happened or existed

opinion something that you think is true, although not everyone may agree with you

Interdisciplinary Connections

Health / Safety
Tie this lesson in with Fire Safety Week at your school.

Language Arts
Ask students to write a letter to Mrs. O'Leary and her family describing present-day Chicago. Include drawings.

Materials (continued)

- **Handout C** - map showing path of the Great Chicago Fire
- **Handout D** - comparing the load-bearing method with a skeleton frame system
- **Handout E** - questions and chart showing growth of the American skyscraper
- **Handout F** - photograph of city re-building after the fire

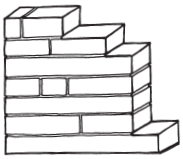
Teacher Prep

- photocopy **Handouts A and E** *(one per student)*
- photocopy or scan **Handouts B, C, D, and F** for display or projection
- prepare the marshmallows by allowing them to sit out on a tray for a day (stale marshmallows make sturdier building materials, and students are less likely to eat them)

Background Information for Teacher

Building construction methods: Chicago Pre-Fire vs. Chicago Post-Fire
In Chicago before 1871, most residential and smaller commercial buildings were constructed from wood. Sidewalks throughout the city also were made from wood. Those combustible materials combined with the hot dry summer led, inevitably, to the Chicago Fire that began on October 8, 1871.

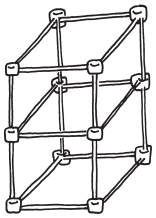
Larger commercial buildings constructed before the Chicago Fire were built using a type of construction called the **load-bearing method**. When one brick is stacked on top of another, the bricks on the bottom support and carry the weight of the bricks on the top. But this method severely limited how tall the buildings could be designed and built. As the building reached higher, the walls at the bottom had to be made thicker to support all the weight of the building. As the walls at the bottom were made thicker, there was less space between the walls for usable rooms. A further problem arose because floors and ceilings were constructed of wood: if the building caught fire, the interior would burn quickly and lead to the collapse of bricks on the exterior.



After the Chicago Fire, the City passed laws that prevented most public buildings from being constructed out of wood. The City decreed that architects needed to design "fireproof" buildings. Although brick and stone were fireproof, these materials limited the heights of buildings. Cast iron, which had been used in construction since 1850, allowed greater flexibility in height and building design. But cast iron melted quite easily in a fire. By the mid 1880s, a stronger material called steel had been perfected. Steel dramatically increased how high buildings could be built. Steel was stronger, lighter, and more resistant to melting than any other building material.

Steel enabled architects to overcome the height limitation of the load-bearing construction method. Rather than stacking brick upon brick, the new method of construction used steel to create a frame or skeleton. This method of construction is known as the **skeleton frame system**. Walls at the base of the building no longer needed to get thicker in order to support the weight of the building because the

steel frame or skeleton was now doing the work. Bricks and other masonry were still used in this new method of construction, only now they were solely used as the skin or outer covering of the building or as ornamentation: they did not help to support the building. (This method of construction is similar to a tower that is made of toothpicks held together with mini-marshmallows and then covered with aluminum foil.) Chicago claims the very first skyscraper, the 10-story Home Insurance Building, designed by William Le Baron Jenney and built in 1885 and demolished in 1931. Skyscrapers built today still use the skeleton frame system.



The effect of the load-bearing method and later change to skeleton frame system can be seen at the Monadnock Building, 53 West Jackson Boulevard, Chicago, which is the tallest masonry-supported structure in the world. At the north end (1891) of the building, the load-bearing exterior walls are 6-feet thick, and the glass window panes are deeply recessed. In contrast, the walls at south section of the building are thinner and the glass window panes are not recessed. The south section of the building was constructed two years later with a skeleton frame.

For information about terra cotta, which is another important fireproof building material in Chicago history, see the Fine Arts lesson for Third Grade.

For information about how buildings stand up, see the Science lesson for Third Grade.

For information about the first skyscraper (the 10-story Home Insurance Building), see the Language Arts lesson for Third Grade.

Activity Procedures

DAY ONE and **DAY TWO**

1 Give each student a copy of the K-W-H-L chart in **Handout A** and fill in the blanks together as a class.

- What do they **K**now about buildings built before and after the Great Chicago Fire of October 1871?
- What do they **W**ant to know about these buildings?
- **H**ow can they find out more information?
- What have they **L**earned? (As a follow-up to the lesson.)

2 Read the following quotation to your class as you display the photograph of the Water Tower from **Handout B** that was taken a few days after the fire near the corner of North Michigan Avenue and Chicago Avenue. Discuss which of his statements are facts and which statements are opinions. Explain the differences between primary sources and secondary sources to your students. Point out the examples (letters, photographs, and charts) of both types throughout the lesson.

Resources

***Children of the Fire*,** Harriette Gillem Robinet. New York: Athenaeum, 1991. This historical fiction book is about an African-American girl named Hallelujah who lived at South State Street and 12th Street. The story, told from her perspective, tells of the challenges she and her family faced as they survived the Great Chicago Fire. Although the book is written at approximately a 5th grade level, you might choose to read portions of it aloud to your class.

"Did the Cow Do It? A New Look at the Great Chicago Fire" in ***Illinois Historical Journal*,** Spring, 1997, Richard F. Bales.

***The Great Chicago Fire: In Eyewitness Accounts and 70 Contemporary Photographs and Illustrations*,** David Lowe, ed. New York: Dover Publications, 1979. Although this book is aimed at adults, the amazing pictures will capture the attention of your students.

***The Great Fire*,** Jim Murphy. New York: Scholastic Inc., 1995. This student-friendly book is a wonderful resource for teaching the Chicago Fire. Maps, photographs, drawings, and portions of a diary by Claire Innes, a young girl who survived the fire, make this book a solid teaching tool. A recording of the book is also available.

Illinois Learning Standards and Benchmarks

16A Apply the skills of historical analysis and interpretation.

16.A.2a Read historical stories and determine events which influence their writing.

16.A.2b Compare different stories about a historical figure or event and analyze differences in the portrayals and perspectives they present.

16.A.2c Ask questions and seek answers by collecting and analyzing data from historic documents, images, and other literary and non-literary sources.

16C Understand the development of economic systems.

16.C.2c (US) Describe significant economic events including industrialization, immigration, the Great Depression, the shift to a service economy and the rise of technology that influenced history from the industrial development era to the present.

16D Understand Illinois, United States and world social history.

16.D.2c (US) Describe the influence of key individuals and groups in the historical eras of Illinois and the United States.

17A Locate, describe and explain places, regions and features on the Earth.

17.A.2b Use maps and other geographic representations and instruments to gather information about people, places and environments.

Sir John Leng, 1871 - a visitor to Chicago from England:

"The first thing we did [after the fire] was to send off our wives and families into the country, and then set to work to relieve those who could not help themselves. I never had my clothes off or slept in a bed till after the tenth day. That was when we knew the water supply was on again, which took off the tension, as we were all afraid the fire might break out again. There were thousands like myself. It was not a time for sleep but for work, and [people] worked then as they had never done before, giving first attention to others rather than themselves." (FROM *AMERICA IN 1876*, JOHN LENG. DUNDEE, GREAT BRITAIN: DUNDEE ADVERTISER, 1877, P. 73-83.)

3 Use the map on **Handout C** to help students understand how and where the fire spread. Compare where the fire started (137 DeKoven Street) with the scene from **Handout B** on North Michigan Avenue. Have students locate both places on the map.

4 Use the "point of view" questions and writing activities listed below to spark discussion about the photograph on **Handout B**.

Observation
- How many people are shown?
- Describe where each person is standing or sitting.
- How are the people arranged?
- What other interesting details can you see in the photograph?

Interpretation
- When do you think the photograph was taken?
- Where do you think the photograph was taken?
- What's going on in this photograph?
- What might the reason be that the people are gathered together?
- Do you think the two women in the photograph knew the group of men standing nearby? Why or why not?
- Do you think the photograph was posed or do you think the people just happened to be standing there in that position when the photographer came along?
- What kind of buildings do you think had been around the site of the Water Tower and Pumping Station before the Fire?

Analysis

Choose one of the people in the photograph to study and think about.
- Who were they?
- What do you think their job was?
- What were they thinking when the photograph was taken?
- If you could travel back in time and ask them one question about what they experienced in the three days before the photo was taken, what would you want to know?

Suggestions for writing and speaking activities
- Write a journal entry from the point of view of a person in the photograph. What are they thinking? Who are they? What should they do now in these days after the fire? What happened to their home, family, business, etc.?
- Have students come up to the front of the class and take turns telling their neighbors (the class) what they saw on Michigan Avenue after the fire, how they felt, and what others around them were thinking. Encourage students to practice their oral presentation at home in front of family members or a mirror. Remind them that writing and using note cards will be helpful.

DAY THREE

5 Divide the class into small groups of three or four students. Distribute two sets of building materials to each group:

Block set - a stack of approximately 20 wooden blocks or 20 small boxes or 20 sugar cubes

Marshmallow set - a large handful of stale mini-marshmallows and many toothpicks (or some Tinker Toys®), and sheets of aluminum foil

6 Distribute the Block set and ask each group to build a structure with the blocks / boxes / cubes. Give them time to enjoy exploring and discovering as they build. After they have finished, discuss how the blocks at the bottom support and carry the weight of the blocks on the top. Have students imagine their building blocks are bricks. Explain that this type of construction is called the **load-bearing method**. Most large commercial buildings constructed before the Chicago Fire were built using this method, and the bricks limited how tall the buildings could be. The walls at the bottom had to be very thick to support all the weight of the structure, which left less space between the walls for rooms inside.

7 Then distribute the marshmallow set and ask each group to build a structure with the marshmallows, toothpicks, and aluminum foil. After they have finished, discuss how the toothpicks represent a steel frame in a building, the marshmallows represent the bolts and welds that hold the frame together, and the aluminum foil represents the outside material or the 'skin' that covers the frame. Make a connection between their own bodies that have a skeleton and skin. Explain that this type of construction is called the **skeleton frame system**. The foil covers the building but doesn't help to hold up the building. After the Chicago Fire, people in the city were very worried about another fire. Therefore, laws were passed to require buildings to be more fireproof. Iron and steel were used in both walls and floors.

8 Use **Handout D** to show Chicago examples and explain the similarities and differences between the two structures students have built. Discuss their results and final designs.

DAY FOUR

9 Distribute **Handout E** that shows the changing height of skyscrapers in America. Talk through and answer the questions provided on the handout. Incorporate ideas learned the previous day about building with the **load-bearing method** versus the **skeleton frame system**.

DAY FIVE

10 Read the following quotation to your class as you display the photograph from **Handout F** that was taken a few months after the fire near the corner of West Lake Street and North LaSalle Street. (The site is currently near the James R. Thompson Center that houses state agencies.) Use the quotation as a starting point for a discussion about how the people of Chicago rebuilt their city after the fire. Compare Sir John Leng's 1871 letter with this one four years later. Discuss which of his statements are facts and which statements are opinions.

Sir John Leng, 1875 - a visitor to Chicago from England:

"There are miles of streets consisting of blocks [of buildings] five, six, seven, and eight stories high. The thoroughfares are crowded, busy, and bustling, and abounding signs of life and energy in the people and their modes of trading are everywhere apparent. Imagine a city of which all the principal public buildings... Post-Office, railway stations, banks, hotels, newspaper offices, warehouses, and shops – were completely burnt down in a conflagration [i.e., fire] that raged for three days and nights over four square miles of ground, and imagine all these replaced, in the course of five years, by much finer and more costly buildings, and you are enabled to form some idea of the wonderful activity that characterizes the Chicago people."

(FROM *AMERICA IN 1876*, JOHN LENG. DUNDEE, GREAT BRITAIN: DUNDEE ADVERTISER, 1877, P. 73-83.)

11 Use the "point of view" questions listed below to spark discussion about the photograph in **Handout F.**

Observation
- How many people are shown?
- Describe where each person is standing.
- What other interesting details can you see in the photograph?

Interpretation
- When do you think the photograph was taken?
- Where do you think the photograph was taken?
- What's going on in this photograph?
- What is happening to the buildings?

Analysis
Choose one of the people in the photograph to study and think about.
- Who were they?
- What do you think their job was?
- What were they thinking when the photograph was taken?
- If you could travel back in time to Chicago, 1871, and ask these people one question about the rebuilding projects they are working on, what would you want to know?

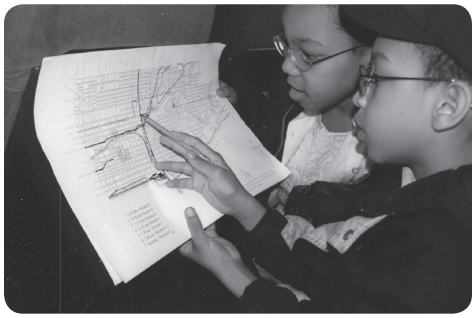
Extensions

- Visit the site of fire's beginnings at 137 DeKoven Street, now the site of the Chicago Fire Academy. A flame-shaped sculpture and a plaque now mark the spot. Talk to your students about the significance of locating the Fire Academy on this particular site. Read portions of the diary of Claire Innes, a young girl who survived the fire, reprinted in *The Great Fire* by Jim Murphy.

- Use historic photographs copied onto plastic transparencies to recreate the experience of standing where an historical event took place. The photograph of the Water Tower in **Handout B** was taken near 700 North Michigan Avenue (west side of the street, south of Chicago Avenue, looking north). You can stand there now and view how the area has changed since the fire. Have students hold up the transparency with the historic photo and view the present-day scene through it. Visually line up the photograph of the Water Tower with the actual Water Tower. Discuss and document what has changed and what has remained the same.

- The Chicago History Museum has a permanent exhibit and an online exhibit on the Great Chicago Fire that includes many artifacts such as melted objects, record books, and newspapers from the days following the fire. Contact them about a visit or for more information: Clark Street at North Avenue, Chicago, Illinois 60614 Telephone 312.642.4600 **www.greatchicagofire.org**

- Take a bus field trip with your class to understand how much of the city was burned in the fire. Travel along the western edge of the fire area noting the spread of the fire. Begin from the southern starting point at 137 DeKoven Street, travel north along Halsted Street, over the river, and up to Fullerton Avenue. Turn east on Fullerton and stop at Lincoln Park and discuss the map on **Handout C**. Complete the journey by traveling south along Lake Shore Drive back to Roosevelt Road. Record the bus' odometer to determine the perimeter of the vast area that was burned.



- The Aurora Regional Fire Museum has exhibits, collections, tours, and educational resources on the history of Aurora and surrounding area fire departments. Contact them about a visit or for more information: P.O. Box 1782, Aurora, Illinois 60507. Telephone 630.892.1572 **www.auroraregionalfiremuseum.org**

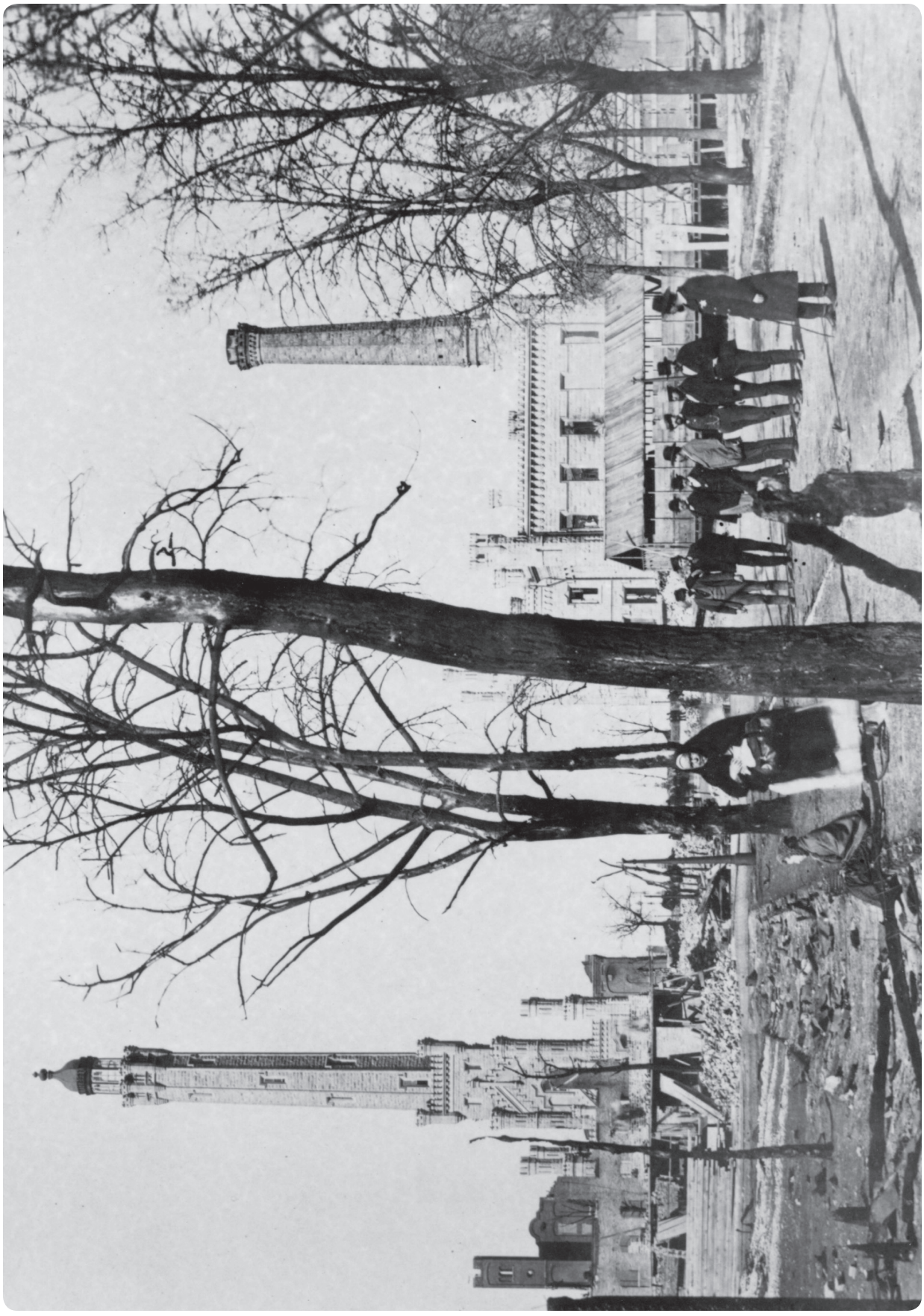
Handout A

Name _____ Date _____

K-W-H-L chart about the Great Chicago Fire of 1871

What do we **K**now about buildings built before and after the Chicago Fire of October 1871	What do we **W**ant to know about these buildings?	**H**ow can we find out more information?	What have we **L**earned?

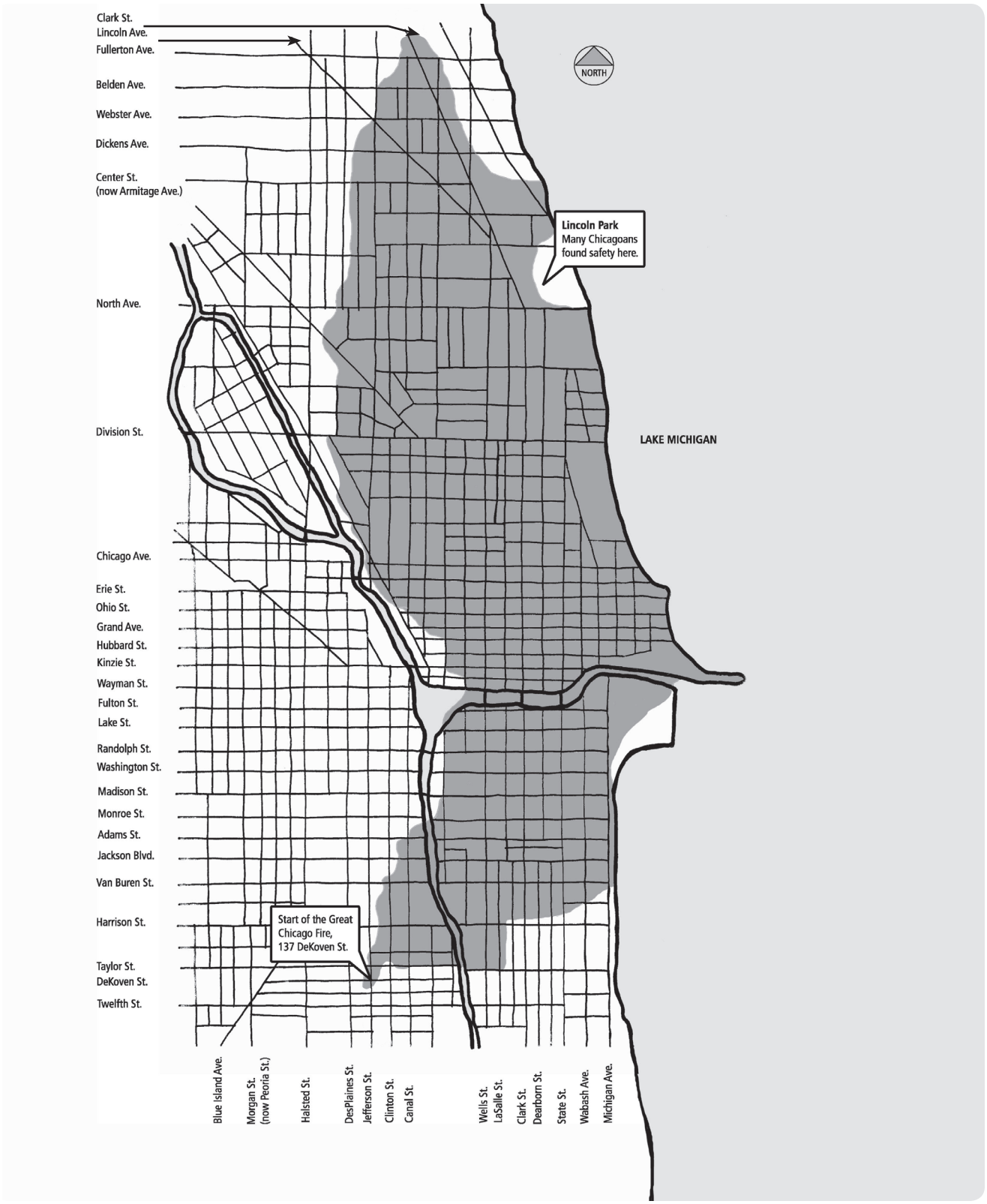
Handout B



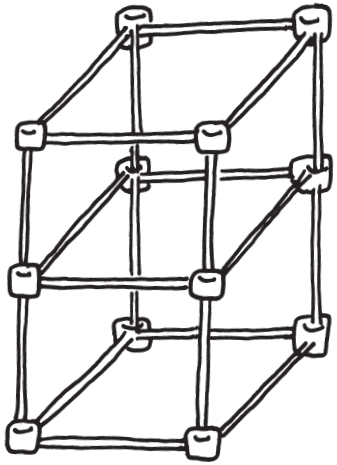
A view looking north along Michigan Avenue showing the Water Tower at Chicago Avenue after the Great Chicago Fire of 1871. (CHICAGO HISTORICAL SOCIETY, ICHi-13918)

Handout C

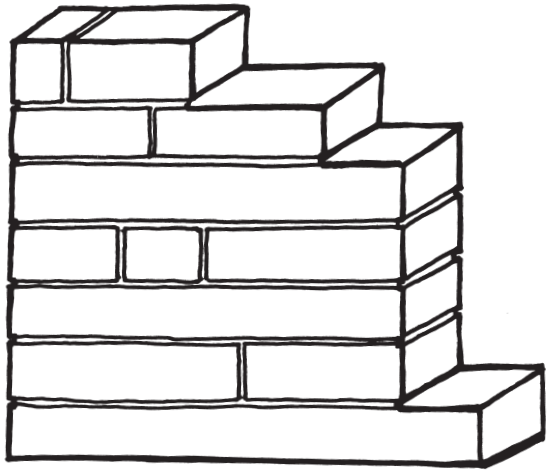
Path of the Great Chicago Fire of 1871



ABOVE A map showing the area of the city burned by the Great Chicago Fire of 1871. (CAF, ADAPTED FROM AN 1871 MAP IN THE COLLECTION OF THE CHICAGO HISTORICAL SOCIETY.)



A model of a skeleton frame system of construction using marshmallows and toothpicks



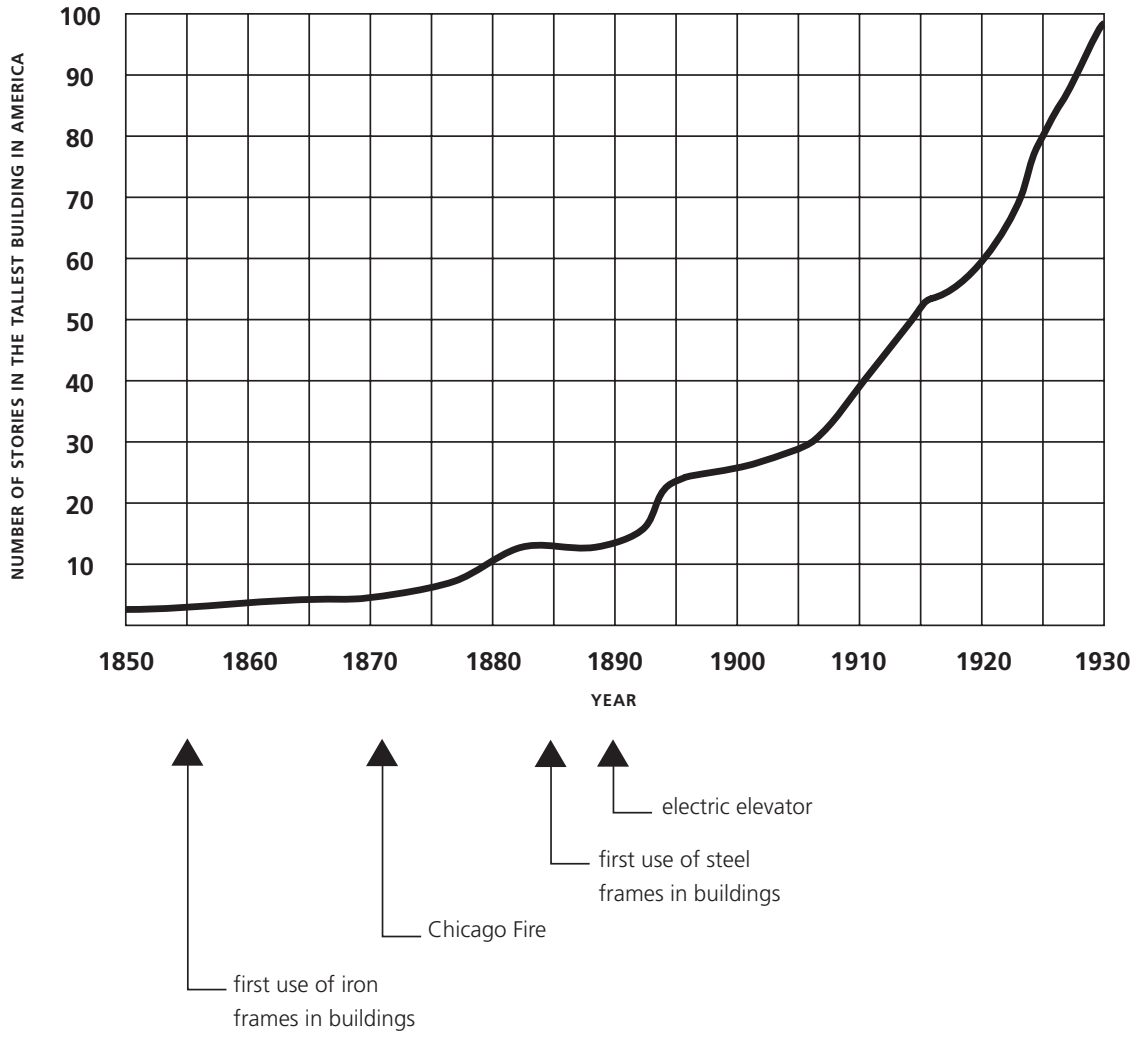
A model of a load-bearing system of construction using bricks

TOP LEFT A building under construction using a skeleton frame system. (CAF COLLECTION)
TOP RIGHT The north half of the Monadnock Building that was built with a load-bearing method of construction. (CAF, PHOTO BY JEAN LINSNER, 2002)

Handout D

Handout E

The Growth of the American Skyscraper



1. Approximately how many stories tall was the tallest building in America in 1870, before the Chicago Fire?

2. From the information on the chart, what two important inventions in technology occurred after the Chicago Fire of 1871 and allowed buildings to become much taller?

3. The height of the tallest building in America stayed below 20 stories for many years. Approximately what year was there a big change in building heights?

4. Why do you think the use of steel made a big difference in how tall buildings could be built?

5. Why do you think the elevator made such a big difference in constructing taller buildings?

6. Approximately what year was the electric elevator invented and used in tall buildings?

ABOVE A chart showing the growth of the American skyscraper. (CAF COLLECTION)

Handout F

A view of Lake Street looking east from LaSalle Street showing workers rebuilding the city after the Great Chicago Fire of 1871.
(CHICAGO HISTORICAL SOCIETY, ICHI-02845)