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A New Skyline

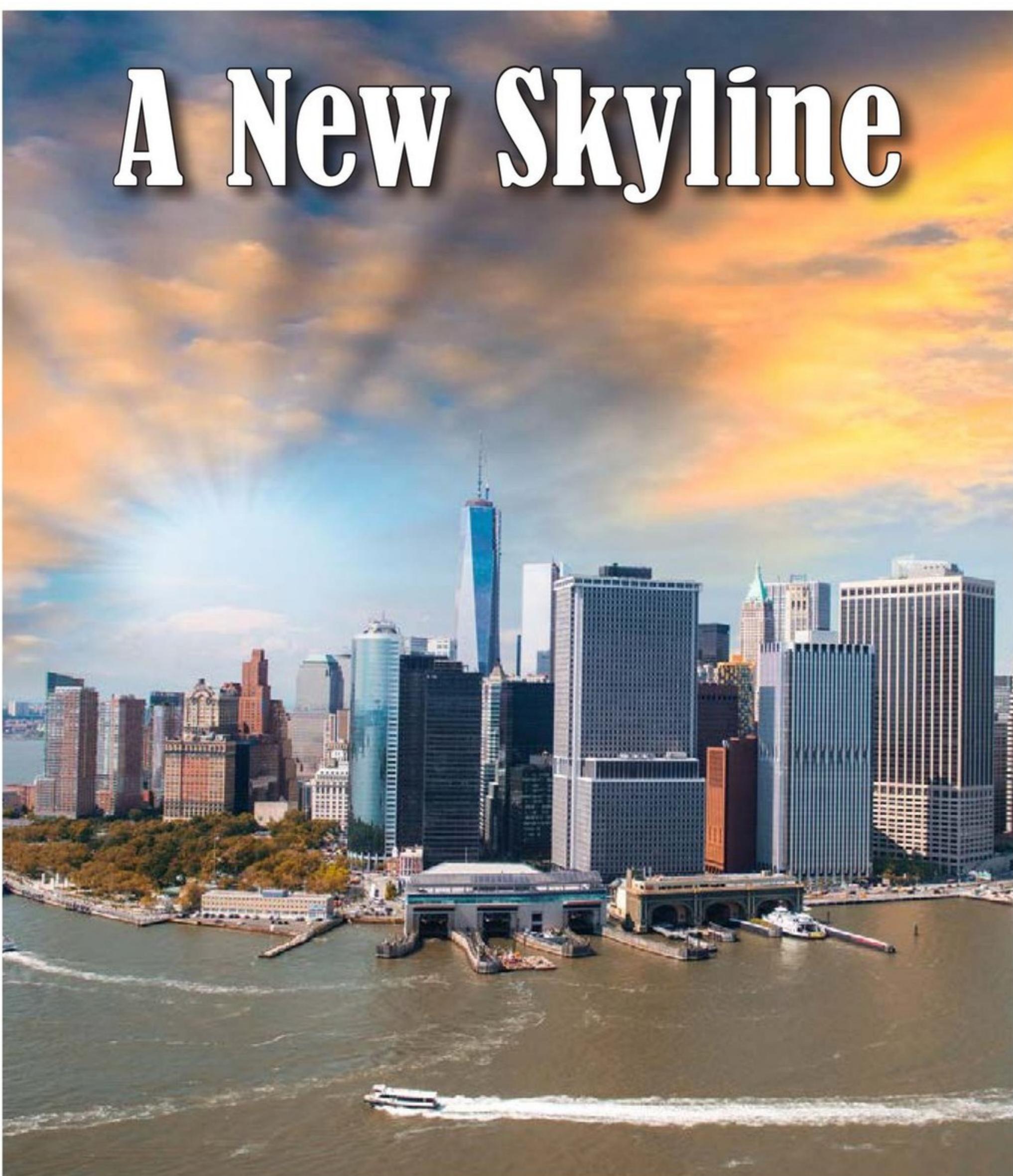


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Focus Question

How has New York City's skyline changed?



Table of Contents

Introduction	4
Growing the Big Apple	5
Building an Empire	9
Twin Giants Rise, Then Fall	11
A New Tower Rises from the Ashes	14
Glossary	16

Introduction

What would Paris be without the Eiffel Tower, or London without its famous clock tower, Big Ben? All over the world, cities are recognizable by a **silhouette** of structures reaching skyward to form their unique skylines. Architecture and skylines are unique identifiers of places, just as your fingerprints are one-of-a-kind identifiers of you. Unlike fingerprints, however, skylines don't stay the same forever—they change, sometimes gradually and at other times quite suddenly.



New York City is a great example of a place whose skyline has seen both kinds of changes. Skyscrapers have risen, fallen, and risen again. From its start as a Dutch colony to its current status as a major world hub, New York's skyline has evolved to reflect the changing times.



An 1884 illustration of Lower Manhattan Island shows how little of the city's structure and skyline was developed at the time.

Growing the Big Apple

New York City wasn't always a towering metropolis. It began as a Dutch trade outpost in the seventeenth century when, in 1609, explorer Henry Hudson sailed the *Half Moon* into the mouth of the river that would eventually bear his name and called the port New Amsterdam.

Eventually, New Amsterdam was taken over by the British and renamed New York. The British port continued to expand and grow well into the 1700s. By the time the American Revolution had begun, four thousand buildings were tightly packed on the streets of southern Manhattan Island. Further expansion occurred during the nineteenth century as New York turned into a major American city when its increasingly diverse population—and its skyline—grew rapidly.

The end of the Civil War in 1865 brought droves of freed slaves north in search of work, followed by waves of European immigrants seeking opportunity in America's manufacturing and trade centers. Many of these refugees made their home on New York City's Manhattan Island. By the late 1800s, New York was the most densely populated city in the United States. By 1925, it was the most densely populated city in the world.

All the city's new residents needed places to live, work, and shop, and the city's borders gradually crept northward as new stores, factories, and homes were built. Manhattan Island, however, is only about 23 square miles (59.6 sq km) in area. It wasn't long before buildable sites became few and far between. Eventually, there was no more room for the city to expand at ground level. The only place to grow was skyward.

To do that, new building methods had to be employed. Up until then, traditional construction methods used walls to support a building's weight. Since the walls on the first floor had to bear the weight of all the floors and the roof above them, they had to be particularly sturdy. Consequently, building height was limited, as there was no practical way to build walls strong enough to support a building with many floors.

Buildings of the New York City Skyline

1 1899

Park Row Building

391 feet (119 m)

29 stories

6 1931

Empire State Building

1,454 feet (443 m)

103 stories

2 1908

Singer Building

612 feet (186.5 m)

37 stories

7 1970

World Trade Center

1,727 feet (526 m)

(North Tower)

110 stories

3 1909

Met Life Tower

700 feet (213 m)

50 stories

8 2014

One World Trade Center

1,776 feet (541 m)

104 stories

4 1913

Woolworth Building

792 feet (241 m)

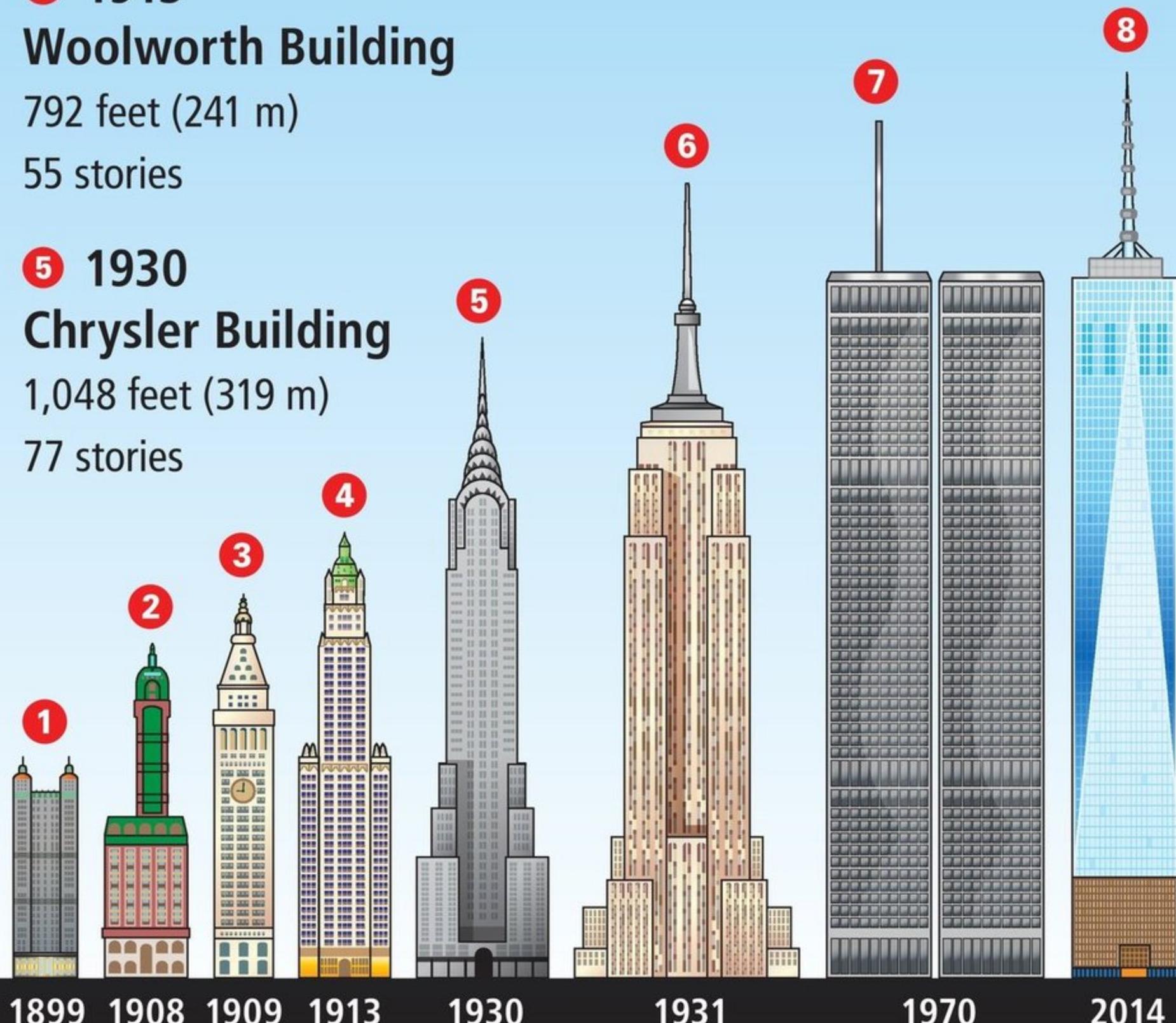
55 stories

5 1930

Chrysler Building

1,048 feet (319 m)

77 stories





The Chrysler Building, an Art Deco style skyscraper, was funded by automobile tycoon Walter Chrysler.

A new construction method used a steel frame instead of the walls to support a structure. Enormous steel beams were connected together to form a building's **skeleton**. Then the walls were hung from the beams, much like curtains from a rod, and attached at the bottom to the floor. With this method, the walls of a building's upper floors were not weighing down on the walls beneath them. The bulk of their weight was instead distributed along the steel beams holding them up.

Steel frame construction made it possible for buildings to reach new heights. By the turn of the twentieth century, New York City housed a number of huge structures dubbed *skyscrapers*. Soon skyscrapers were going up one after another as builders and architects competed to make the world's tallest building.

Building an Empire

By the late 1920s, New York City's skyline had risen to new heights. It was during this time that two of the city's most famous landmarks were built.

In 1928, the seventy-seven-story Chrysler Building was under construction and locked in a floor-by-floor duel for the title of world's tallest with another building being erected nearby. So fierce was the competition for this title that the Chrysler builder smuggled a tall spire onto the top of his structure. The secret plan worked. The Chrysler Building became the world's tallest structure and also the only one taller than 1,000 feet (305 m).

But the Chrysler Building's reign was short-lived. Just blocks away, a steel-framed behemoth was rising. The Empire State Building would take the crown for world's tallest. It would also come to define the city it called home.



The Empire State Building during construction (above) and completed (below). Four-and-a-half stories were added per week.



Workers broke ground on the Empire State Building in January 1930. Amazingly, it was completed just 410 days later, thanks to more than 3,000 workers who contributed skills and labor. The 103-story steel and granite building stood over 1,400 feet (427 m) tall. Sixty-four elevators carried people from the ground to the 80th floor in less than one minute. An outside observation deck on the 86th floor and an inside deck on the 102nd floor provided **panoramic** views of the city.

The Empire State Building became the symbol of New York City. It was named one of the Seven Wonders of the Modern World and was featured in many books and movies. It wore the crown of world's tallest building for nearly forty years, until deposed by twin giants rising downtown.

The Port Authority

The Port Authority of New York and New Jersey is an organization formed in 1921. Its purpose was to develop, modernize, and operate trade and transportation facilities in both New Jersey and New York City. The Port Authority still owns and manages much of the 16-acre (64,750 sq m) World Trade Center complex.



The Port Authority was in charge of building the George Washington Bridge, which connects Manhattan and New Jersey.

Twin Giants Rise, Then Fall

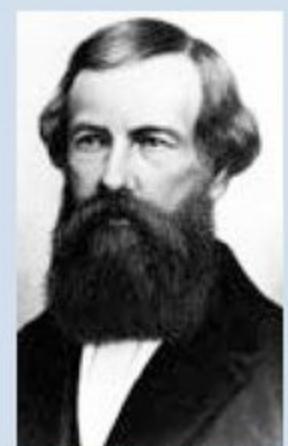
After the Empire State Building was built, skyscraper construction fell into a slump due to a struggling American economy. It was not until 1970 that the city's skyline would grow even higher.

In the 1960s, city officials considered building a "world trade center"—a hub for international commerce—in Lower Manhattan. The Port Authority of New York and New Jersey was in charge of the project.

Architect Minoru Yamasaki proposed twin towers as part of the multibuilding **complex** of offices and storefronts. The 110-story towers would include some structural **innovations**.

Who Was Elisha Otis?

How were people supposed to get to the upper floors of a skyscraper? Climbing hundreds of stairs wasn't a realistic option—elevators were needed. Early elevators, however, weren't as safe as they should have been.



Thanks to Elisha Otis, this problem was resolved. Otis designed the first safety elevator in 1854. The elevator's platform would fall only a few inches if the cable holding it broke. He also designed engines to power the elevator.

Without a doubt, Otis's invention was necessary to the development of tall buildings. The next time you're in an elevator, look around. There's a good chance you'll see the name "Otis" somewhere inside!



Over 3,500 workers helped build the World Trade Center's twin towers during their peak of construction.

One such innovation was the use of tube-frame construction instead of steel frame construction. Each tower would be similar to a hollow square pipe, with vertical columns spaced closely along its exterior **perimeter**. Surrounding the edge of the building with main support columns reduced the number of interior supports required. This created much more usable floor space.

Another innovation was the use of sky lobbies. Building height dictates the number of elevators needed to move people and freight. Given the size of the towers, Yamasaki proposed an elevator system modeled after the city's subway lines. People could take an express elevator directly to a sky lobby on a higher floor while bypassing the floors beneath it and then transfer to a local elevator that would stop at each of the next ten floors above. This system was an **ingenious** and efficient way to transport people **vertically**, reducing the number of elevator shafts needed.

Construction of the towers began in 1966. The North Tower, which was completed in December 1970, measured 1,727 feet (526 m) tall at the tip of its spire. On the top floor, the Windows on the World restaurant offered diners a breathtaking view. The South Tower, reaching 1,362 feet (415 m) in height, was finished seven months later. Beneath both buildings was a parking garage, a railroad, and subway stations.

The Twin Towers were a striking addition to the city's skyline. Located some distance from the city's other tall skyscrapers, they **dwarfed** the surrounding buildings. They were the tallest and most **prominent** structures on Manhattan Island for thirty years. Then disaster struck.



On September 11, 2001, terrorists flew two planes into the Twin Towers.

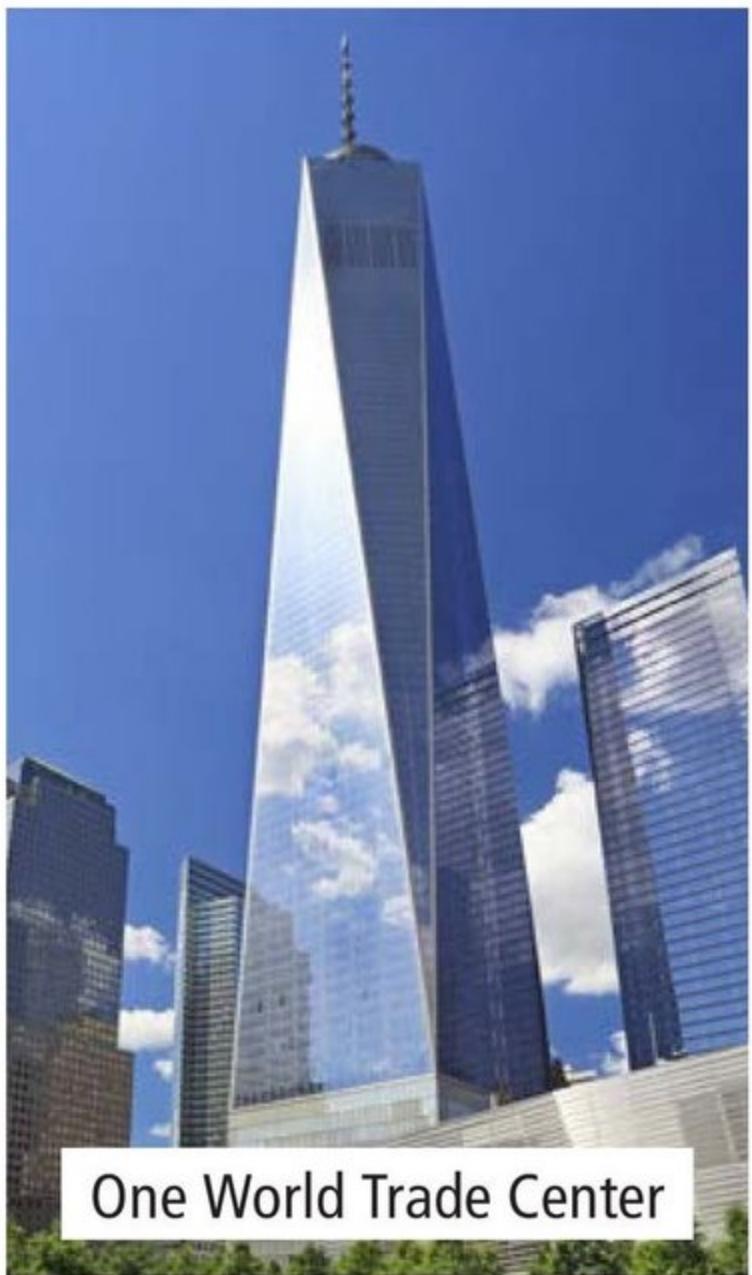
On the morning of September 11, 2001, hijackers flew two passenger jets into the towers. Within an hour after the attack, the South Tower began to collapse and crumble to the ground. The North Tower followed thirty minutes later. New Yorkers watched in stunned disbelief as these enormous structures were reduced to heaps of burning rubble. Nearly three thousand people died as a result of the attack.

A New Tower Rises from the Ashes

The World Trade Center tragedy devastated New York and the rest of the country. New Yorkers mourned the loss of their neighbors and their landmark. They vowed to rebuild an even bigger, better World Trade Center site.

Excavating the ruins of the old towers took time. Plans for the site took years to develop. There were many ideas and opinions on what should be done, and many designs were submitted with considerable controversy.

Finally, the Port Authority unveiled the design for the new World Trade Center complex. One area was set aside as a memorial park for those who lost their lives that day. The sites where the original buildings stood are now reflecting pools with cascading waterfalls. A memorial museum contains historical artifacts from the old towers.



Nearby, a new 104-story tower has been constructed. Nicknamed the *Freedom Tower*, the structure rises an amazing 1,776 feet (541 m), symbolizing the year of the United States' independence and making it taller than either of the original towers. The glass-paneled tower has a twisted octagonal shape with a reflective surface that mirrors the changes in light around it. At the top is a spire equipped with a light beam that is visible for miles.

Several other high-rise buildings are being constructed at the site as well. By the year 2020, the new World Trade Center complex should be complete. New York's ever-changing skyline will reflect the resilient spirit of a city that continues to adapt and grow.



One of the two reflecting pools at the World Trade Center Memorial. Both feature the largest human-made waterfalls in the United States.

Glossary

behemoth (<i>n.</i>)	someone or something with immense size or power (p. 9)
complex (<i>n.</i>)	a group of buildings close to one another used for a common purpose (p. 11)
dwarfed (<i>v.</i>)	caused something to seem smaller or less important (p. 13)
ingenious (<i>adj.</i>)	having or demonstrating cleverness, skill, or intricacy (p. 12)
innovations (<i>n.</i>)	new ideas, products, or ways of doing something (p. 11)
landmarks (<i>n.</i>)	important historical buildings or sites; objects on land that mark a place (p. 9)
panoramic (<i>adj.</i>)	having a complete view in every direction (p. 10)
perimeter (<i>n.</i>)	the measurement around the outside edge of an area or surface (p. 12)
prominent (<i>adj.</i>)	easily seen, standing out, or important (p. 13)
silhouette (<i>n.</i>)	a solid, dark shape surrounded by light or set against a light background (p. 4)
skeleton (<i>n.</i>)	a framework that supports a structure, such as a building (p. 8)
vertically (<i>adv.</i>)	in a way that is straight up and down (p. 12)

Words to Know

behemoth
complex
dwarfed
ingenious
innovations
landmarks

panoramic
perimeter
prominent
silhouette
skeleton
vertically

Front cover: The Brooklyn Bridge spans the East River from Brooklyn to Lower Manhattan Island.

Title page: A photo taken from a helicopter shows a spectacular bird's-eye view of Lower Manhattan Island.

Page 3: A construction worker perched on a beam (top) bolts the framework of the Empire State Building, 1930. A Port Authority policeman (bottom) monitors traffic from his electric patrol car in the Holland Tunnel, New York City.

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Level Z Leveled Book
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