



Tour:

NYC STEM

Destination:

Manhattan, New York

Specialization:

Science, Math, Technology, Engineering & Physics

Itinerary:

6-days / 5-nights in NYC

Dates:

Year-round with the exception of Christmas/New Years

NYC STEM				
Day	Morning	Afternoon	Evening	
1	Travel to New York City; transfer & check into hotel	Welcome, Safety & Orientation Meeting	Welcome Dinner	Times Square Exploration
2	American Museum of Natural History + Rose Center for Earth & Space	Columbia University Campus Tour	Dinner	Group Photo
3	Liberty Science Center + 2 Master Classes (Choose from Game Design, Physics & Engineering or Biology & Ecology)		Dinner	Free Time
4	Intrepid Sea, Air & Space & Private Aviation Physics Tour	Virtual Reality World + Master Class	National Museum of Math + Master Class	Empire State Building
5	Wall Street & Financial District Walking Tour	Statue of Liberty + Ellis Island Immigration Museum with Audio Guides	Farewell Dinner	
6	Depart NYC for Home			



As with all sample itineraries, please be advised that this is an 'example' of a schedule and that the activities and hotels shown may be variable dependent upon dates, weather, special requests and other factors. Itineraries will be confirmed prior to travel.



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New York City...

Immerse yourself in New York City for five minutes and you'll see why it's like no other place on earth. It's why countless people have pinned their dreams on the place, thrown caution to the wind and shown up on its doorstep. And it's why visitors keep streaming in from all corners of the globe, grasping at their silver-screen visions – and finding them – but discovering plenty more on the way. New York is a city that's got so many sides and so much to offer that it can be intimidating at times but visit with an open mind and you're likely to fall in love with this city. The buildings are soaring, look-at-me towers; crowds are boisterous and diverse; millions of restaurants and shops cater every conceivable taste; museums and performance venues offer everything from masterworks to avant-garde creations. Around almost any corner is a comingling of energy, congruous and clashing at the same time. The result is messy, beautiful, and very New York!



Did you know?

- ✓ The term “Big Apple” originally referred to horse racing! The city got its most famous nickname from a local newspaper’s horse racing column in the 1920s. Prior to the city’s adoption of the nickname, the phrase “Big Apple” was used to describe a big money prize at horse races held around the city.
- ✓ New Yorkers speak approximately 800 languages. Over 37 percent of New Yorkers were born in another country, so it’s unsurprising that the city’s residents speak a wide range of languages—but by any account, 800 is impressive. 4 in 10 households speak a language other than English.
- ✓ Most of us associate cowboys with the Wild West—not the West Side of Manhattan. But from 1850 to 1941, New York’s 10th Avenue had its own special team of cowboys. Responsible for wrangling people rather than cows, the West Side Cowboys would ride on horseback ahead of the freight trains that ran down the middle of the street, warning people to get out of the way.
- ✓ NYCs population is the highest of any American city and a little over 8 million people live in the City. It means 1 in every 38 people in the United States call the city home. With over 27,000 people per square mile, it's not just the densest major city, it also accounts for more than 40 percent of New York State's entire population.
- ✓ The Bronx takes its name from its first European settler. Jonas Bronck, who moved to America from Sweden in 1639, was the first European to settle in the Bronx. His farm, covering about 500 acres, was referred to as “Bronck’s Land,” and the river was called “Bronck’s River.” Over the years, people started calling the whole area the “Bronx”.



- ✓ France gifted the Statue of Liberty to the United States in 1886 for its centennial celebration. The statue was shipped as 350 pieces in 214 crates and took 4 months to assemble at its current home on Ellis Island.
- ✓ New York City's Federal Reserve Bank has the largest gold storage in the world. The vault is 80 feet below street level and contains \$90 billion in gold.
- ✓ The first pizzeria in the United States opened in NYC in 1895. Since the 1960s, the price of a slice of pizza has been roughly the same price as a subway ride, generating the idea of "Pizza Principle" among economists.
- ✓ Times Square is named after the New York Times. It was originally called Longacre Square until the Times moved there in 1904.
- ✓ New York City became the first capital of the United States in 1789.

Day 1

Dinner

On arrival in the city, we'll be met at the airport, load our coach and transfer to our hotel. After check-in and getting sorted in our rooms, we will have our **Welcome, Safety & Orientation Meeting**. We'll have our **Welcome Dinner in Times Square** this evening. If you arrive early enough, we'd love to help you plan some activities. There's so much to do in NYC!

Rooming: Typical Manhattan hotel rooms have two full/queen beds and sleep 4 pupils per room. Teachers sleep one person per bed with up to 2 staff in each room. All rooming is based on gender. Please do understand that hotel rooms in NYC are expensive and this is why we always try to maximize occupancy. The most cost-effective times of the year to stay in NYC are January through March; the most expensive times are October and December. Summer can be a great time for hotel rates, but please beware of possible increased airfares if flying.



Times Square Exploration – Times Square is a major commercial intersection, tourist destination, entertainment center and neighborhood in the Midtown Manhattan section of NYC at the junction of Broadway and 7th Avenue. Brightly lit by numerous billboards and advertisements, it stretches from West 42nd to West 47th Streets, and is sometimes referred to as "the Crossroads of the World", "the Center of the Universe", "the Heart of the Great White Way", and "the Heart of the World." It is one of the world's busiest pedestrian areas, the hub of the Broadway Theatre District, and a major center of the world's entertainment industry. Times Square is one of the world's most visited tourist attractions, drawing an estimated 50 million visitors annually. Approximately

330,000 people pass through Times Square daily, many of them tourists, while over 460,000 pedestrians walk through Times Square on its busiest days.

Day 2

Breakfast & dinner included; lunch on own

Rise and shine, New York City! After breakfast in our hotel, today we'll visit one of the top science museums in the world. Get ready to be WOWed!



The American Museum of Natural History - is one of the largest natural history museums in the world. Located in Theodore Roosevelt Park across the street from Central Park, the museum complex comprises 26 interconnected buildings housing 45 permanent exhibition halls, in addition to a planetarium and a library. The museum collections contain over 34 million specimens of plants, animals, fossils, minerals, rocks, meteorites, human remains, and human cultural artifacts as well as specialized collections for frozen tissue and genomic and astrophysical data, of which only a small fraction can be displayed at any given time, and occupies more than 2 million square feet (190,000 m²). The

museum has a full-time scientific staff of 225, sponsors over 120 special field expeditions each year, and averages about five million visits annually. The one mission statement of the American Museum of Natural History is: "To discover, interpret, and disseminate—through scientific research and education—knowledge about human cultures, the natural world, and the universe."

This excursion includes the Museum's permanent collection and the Rose Center for Earth and Space. IMAX films and space shows at the Planetarium are available at extra cost. The Rose Center for Earth and Space at the AMNH encompasses the spectacular Hayden Sphere and exhibitions that explore the vast range of sizes in the cosmos, the 13-billion-year history of the universe, the nature of galaxies, stars, and planets, and the dynamic features of planet Earth.

After our wonderful experience, we'll head to Central Park for a walk!

Central Park - Since day one, Central Park has been the city dweller's backyard: a lush and wide-open retreat from the swarming cityscape just beyond its perimeter. Arguably one of the most famous parks in the world, Central Park is a manmade wonder. Not only is it the first public park built in America, but it is also one of the most frequently visited, with over 25 million guests per year. Set in the middle of bustling Manhattan, its grounds serve as a safe haven, not only for athletes, daydreamers, musicians, and strollers, but also for teams of migratory birds each year. One can spend an entire peaceful day roaming its grounds, gazing upon nearly 50 fountains, monuments, and sculptures or admiring its 36 bridges and arches. With recreational facilities abounding, the more energetic won't have a problem finding a spot to skate, pedal, row, dribble, or climb to his or her heart's delight. Although Central Park has 21 official playgrounds, we like to think of it as one gigantic jungle gym in its peak season. 150 years' worth of visitors have enjoyed and recommended Central Park; it is now your turn!



Later in the day we'll set off for Columbia University for a **self-guided** Campus Tour.

Columbia University Campus Tour - Columbia University is a **private Ivy League research university** in New York City. Established in 1754 on the grounds of Trinity Church in Manhattan, Columbia is the oldest institution of higher education in New York and the fifth-oldest institution of higher learning in the United States. It is one of nine colonial colleges founded prior to the Declaration of Independence, seven of which belong to the Ivy League. It has been ranked by numerous major education publications as among the top ten universities in the world.



Columbia scientists and scholars have played an important role in the development of notable scientific fields and breakthroughs including brain-computer interface, the laser and maser, nuclear magnetic resonance, the first nuclear pile, the first nuclear fission reaction in the Americas, Thomas Hunt Morgan's drosophila experiment – considered the origin of modern genetics, the first evidence for plate tectonics and continental drift, and much of the initial research and planning of the Manhattan Project during World War II. The Columbia University Physics Department has been affiliated with 33 Nobel Prize winners as alumni, faculty or research staff, the third most of any American institution behind MIT and Harvard. In addition, 22 Nobel Prize winners in Physiology or Medicine have been affiliated with Columbia, the third most of any American institution.

In 2019, Columbia's undergraduate acceptance rate was 5.1%, making it one of the most selective colleges in the United States, and the second most selective in the Ivy League after Harvard. Columbia is ranked as the 3rd best university in the United States by U.S. News & World Report behind Princeton and Harvard. The university's endowment stood at \$10.9 billion in 2019, among the largest of any academic institution.

As of 2018, Columbia's alumni and affiliates include: five Founding Fathers of the United States—among them an author of the United States Constitution and a co-author of the Declaration of Independence; three U.S. presidents; 29 foreign heads of state; ten Justices of the United States Supreme Court, two of whom currently serve; 96 Nobel laureates; 101 National Academy members; 53 living billionaires; eleven Olympic medalists; 33 Academy Award winners; and 125 Pulitzer Prize recipients.

This evening, we'll have dinner locally and then meet in Times Square for a **Group Photo!**

Day 3

Breakfast & dinner included; lunch on own

Rise and shine Manhattan! After breakfast at our hotel, we'll head to the Metro station, transferring to lower Manhattan and onto the New Jersey PATH system to take us to the Liberty Science Center.



The Liberty Science Center – At LSC, your students will be inspired to learn about the power, promise, and pure fun of science, math, engineering and technology. LSC's hands-on extended laboratory programming offers high-quality, interdisciplinary project-based learning that combines critical thinking, collaboration, and problem-solving skills using real world examples to help support students in making the connection to learning. Students will strengthen the tools and skills necessary for scientific study into math and science connections as well as the world of medical technology and engineering during STEM instructor led facilitated classroom discussions and experiments.

While here, please know that you may have your choice of 2 Master Classes. Here are options:

- ✚ **Intro to Game Design** - Design custom characters with animations and behaviors by completing a crash course in Stencyl. This intuitive toolset is limited only by your creativity. This platform sets a foundation of computational thinking—an essential skill in today's tech-driven world.
- ✚ **Unreal Creations! Designing a Game with Unreal Engine** - Level up your skills in this game design and programming primer course using industry-level tools! Take the first step into professional-level game design as you learn how to set up your first project in Unreal Engine and learn the basics of coding in C++. Some programming experience is recommended for this class.
- ✚ **Advanced 3D Modelling with Autodesk Maya** - In this program exploring advanced 3D modelling, students will learn the techniques and methods used professionally to create 3D models and meshes. Students will leave with access to a digital model that they have created (requires access to a Google Drive account or similar file-storage service).
- ✚ **Virtual Reality and Your Brain** - Ever want to know what it would be like to stand on an I-beam a few hundred feet in the air without safety gear? Using HTC Vive and other tools, students will learn how their brain perceives reality and why VR is such an immersive technology.
- ✚ **Bridge Engineering: Engineering & Design Challenge** - Your group will be engaged in advanced 3D design of bridges with Autodesk Tinkercad. Learn to work in collaborative groups to solve complex problems using 3D printers.
- ✚ **Physics of Car Crashes** - Explore the physics of car crashes and safety devices through the study of varying types of collisions (elastic and inelastic), force, and impact time. This exploration will guide your students to use Vernier sensors to engineer and analyze their own device which will survive the impact of a 'crash'.
- ✚ **Sphero Rovers: Mission to Mars!** - Can you create the next Mars rover design? In this program use your engineering and design skills to create a Sphero driven rover that can carry a payload across our simulated Mars surface. Once you have designed your rover, jump into the driver's seat and code your way through the tricky terrain!
- ✚ **Aviation: From Paper Airplanes to Drones** - This is drone training 101. Learn basic concepts of flight and apply this knowledge through hands-on experiences like using flight experiments and micro pocket drones.
- ✚ **Stabilizing the System** - Learn about homeostasis and feedback mechanisms as you use Vernier sensors to observe and analyze your own heart rate, lung capacity, blood pressure, and more.
- ✚ **Our Water Systems: What's in Our Water?** - Where does the water we use come from, where does it go, and what happens to it along the way? Students explore our water systems through a gallery format, becoming an "expert" on a contributing aspect such as eutrophication, combined sewage overflow, pH levels, and marine life in New York Harbor. Students then test local water from the Hudson River as well as our tap water, comparing the results to EPA guidelines.



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- Unlocking Your DNA** - Discover the world of genetics as you explore the human genome. Use hands-on lab techniques and lab equipment such as micro-pipettes, centrifuges, and gel electrophoresis chambers as you solve a genetic mystery.
- Forensic Anthropology** - Tibia or not tibia, that is the question! Learn to observe and identify the bones and features that make us unique. Tell the story of a human by reading the patterns in various skeletal features. Then, solve an archaeological crime by using clues dug up from Earth to determine whether you're dealing with a funeral or a fraud.

After our thrilling day, we'll head back to Manhattan for dinner and free time.

Day 4

Breakfast & dinner included; lunch on own

Good morning NYC! This morning, we will take a look at some amazing aircraft and start to understand the physics behind them.

Intrepid Sea, Air & Space Museum - The Intrepid Sea, Air & Space Museum is a unique journey through all things military and maritime, with spectacular interactive exhibits. Located at Pier 86, the complex boasts authentically restored vessels, the most impressive being the World War II aircraft carrier the USS Intrepid and the submarine USS Growler. You'll also spy a British Airways Concorde, as well as Sikorsky, Skyhawk, and Vietnam-era Iroquois Huey helicopters. As for space memorabilia, the Space Shuttle Pavilion showcases the Enterprise, the first space shuttle. You can also visit a replica of an Aurora capsule and try out the virtual flight zone, which simulates the exhilaration of flying in a supersonic jet. While here, students will participate in a specialized tour.



Aviation Physics Master Tour – This tour explores the aircraft carrier *Intrepid* and examines the machinery that makes flight at sea possible. In hands-on activities, students work in groups to demonstrate the physics of flight and how those forces interact with one another.

In the afternoon, we will make a pretty interesting stop.... One you probably won't forget!

Virtual Reality World & Master Class - Merging culture with cutting-edge tech, VR World creates an experience that's rooted in bringing people together pioneering a new way to engage with art, film and gaming in mixed reality. VR World was founded in 2017 by a team of dreamers, innovators, and creators in the heart of New York City. Educational experiences are carefully chosen to engage youth across several disciplines including natural history, math, anatomy, physics, art and design, offering a unique environment to explore. VR World's immersive lessons and



curriculum are crafted to engage and inspire students from introduction to conclusion. Students will not only experience but create with this unique content.



National Museum of Mathematics aka “MoMath” – The Coolest thing that ever happened to Math! The National Museum of Mathematics highlights the role of mathematics in illuminating the patterns and structures all around us. Its dynamic exhibits, gallery and programs are designed to stimulate inquiry, spark curiosity, and reveal the wonders of mathematics. Groups will choose one Master Class out of the following 45-minutes sessions to participate in:

Topology - Sometimes called “rubber geometry”, topology is the study of properties of objects that don’t change even when those objects are twisted, stretched, shrunk, and bent. Circles become squares, flat becomes curved, and coffee cups become doughnuts in this amazing branch of math.

Knot Theory - Dating back to prehistoric times, knot theory has been used to record information, create the shelter and transportation methods necessary for survival, and adorn artwork all over the world. In modern life, we encounter knots daily, in more places than just our shoes. Inspired by these everyday knots, mathematical knot theory focuses on knots whose ends are joined together and cannot be undone. Since the 19th century, over six billion knots and links have been classified. Today, knot theory, a branch of topology, is used to help us understand statistical mechanics, quantum computation, pharmaceutical design, and even our own DNA.

Cryptography - By hiding messages in shapes, gibberish, and number codes, cryptography has allowed people, from the time of the ancient Greeks through today, to safely transmit secrets. Court intrigue, star-crossed love, and war have all benefited immensely from this method of communication. These days, cryptographers have traded the cipher disk for the computer screen, but cryptography still influences our life in covert ways. By harnessing statistics, abstract algebra, and other branches of mathematics, cryptography lets us breathe easier when we go to an ATM, create a password for our computer, or send money electronically.

Graph Theory - Graphs can help us study everything from the internet to transportation networks, and from ecological systems to groups of friends. Wherever things are connected or related to each other, graph theory is there. The programs offered in graph theory offer different introductions to the subject, highlighting the intuitive and creative problem solving that makes graph theory so much fun.

Probability - Probability is a way to quantify the likelihood of an event occurring. Students explore this concept through guided interactive experiments and challenges. Some prior exposure to basic probability and familiarity with adding fractions is assumed for these programs.

In the evening, after dinner we’re off to explore the stunning view from the Empire State Building.



The Empire State Building - New York's famous Empire State Building, a New York City and National Historic landmark, soars more than a quarter of a mile into the atmosphere above the heart of Manhattan. Located on the 86th floor, 1,050 feet (320 meters) above the city's bustling streets, the Observatory offers an immersive experience with panoramic views from within a glass enclosed pavilion and from the surrounding open-air promenade. The building, one of New York City's main tourist attractions, offers a variety of activities. Check out the two-story building model and stunning art deco ceiling murals along with the

historical “Dare to Dream” exhibit. There are restaurants, a sushi bar, coffee shops, a drug store, a post office and two banks in addition to the plethora of restaurants and nightlife activities in the surrounding area.

The Observation Deck wraps around the building’s spire, providing 360-degree views of New York and beyond. From up here you’ll get one-of-a-kind views of Central Park, The Hudson River and East River, The Brooklyn Bridge, Times Square, The Statue of Liberty, and much more. Their official Observatory Experience app teaches you about your view from every direction. Then, take advantage of the high-powered binoculars to get a closer look!

Day 5

Breakfast & dinner included; lunch on own

Rise and shine Manhattan! Today we’ll have a chance to learn more about this fabulous city.



Wall Street & the Financial District Walking Tour – As insiders, our guides have many stories to share from the trenches of Wall Street. They put faces and events to the buildings and landmarks to personify and demystify Wall Street. Meandering the narrow, winding streets of lower Manhattan, you’ll hear stories that will entertain, inform and shock. Learn about 400 years of history that led to modern Wall Street from the Dutch trading outpost to the humble beginnings of the NYSE to the current financial markets. The itinerary includes the New York Stock Exchange, Wall Street Federal Hall, House of Morgan, 40 Wall Mercantile Exchange, Cotton Exchange Pearl Street, Deutsche Bank, Lehman Brothers, Goldman Sachs, Charging Bull, Bowling Green, Canon of Heroes, Trinity Church and the Federal Reserve.

Next, we’re in for a real treat....

Statue Cruises: Statue of Liberty & Liberty Island exploration, plus the Ellis Island Immigration Museum – Departing from Battery Park, get a chance to see the Statue of Liberty National Monument and the Ellis Island National Immigration Museum in this absolutely fascinating journey. Enjoy an audio tour and get an in-depth look at America's enduring symbol of freedom: **The Statue of Liberty**. Continue to Ellis Island for access to the **Ellis Island Immigration Museum** and free time to explore. Indoor and outdoor seating is available; concessions and souvenirs are available on board. Be sure to wear comfortable clothing and shoes!



This evening, we’ll have our farewell dinner in Times Square and some free time for last minute activities.

Day 6

Breakfast included but dependent upon departure time

Today we'll end our tour with free time in the morning (dependent upon flight timings) before departure. When it's time to check-out, we'll get packed up and say goodbye to our new friends, taking memories away with us that will last forever.



NYC STEM

Minimum Booking Numbers: 20 students

What's Included:

- Roundtrip flights or motorcoach transfers
- 5-nights' accommodation in Manhattan
- Airport transfers in NYC
- Metro Card use for daily transfers
- Meals in destination – Breakfasts & dinners daily starting with dinner on arrival and ending with breakfast on departure
- American Museum of Natural History & Rose Center for Earth & Space
- Central Park Walk
- Times Square Excursion
- Columbia University Visit & Self-Guided Campus Walk
- Group Photo in Times Square
- Liberty Science Center with 2 specialized Master Classes
- Intrepid Sea, Air & Space Museum + Aviation Physics Tour
- Virtual Reality World + Master Class
- National Museum of Mathematics + Master Class
- Empire State Building – evening view
- Wall Street & the Financial District Walking Tour
- Statue of Liberty with Audio Guide
- Ellis Island's Immigration Museum with Audio Guide
- Personal Tour Ambassador
- Fund-a-Forest: A tree is planted in the name of each guest
- Dollar\$ For Scholars: \$2 donation in the name of each guest
- 24-hour emergency cover

What's Not Included:

- Fully comprehensive insurance (mandatory)
- Transfers to/from home airport
- Lunches and snacks/beverages other than at mealtimes
- Cost of visas, full or collective passports
- Cost of inoculations or medication required for travel
- Sightseeing / Entertainment Options not shown in Itinerary
- Hotel incidental deposits & bills – meals, mini-bar items, recreation, purchases billed to room, etc.
- Any gratuities – drivers, hotel services, Ambassador, local guides

As always, our staff are always available to you to answer any questions you may have regarding programming.
If we may serve you in any way, please do not hesitate to contact us.



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