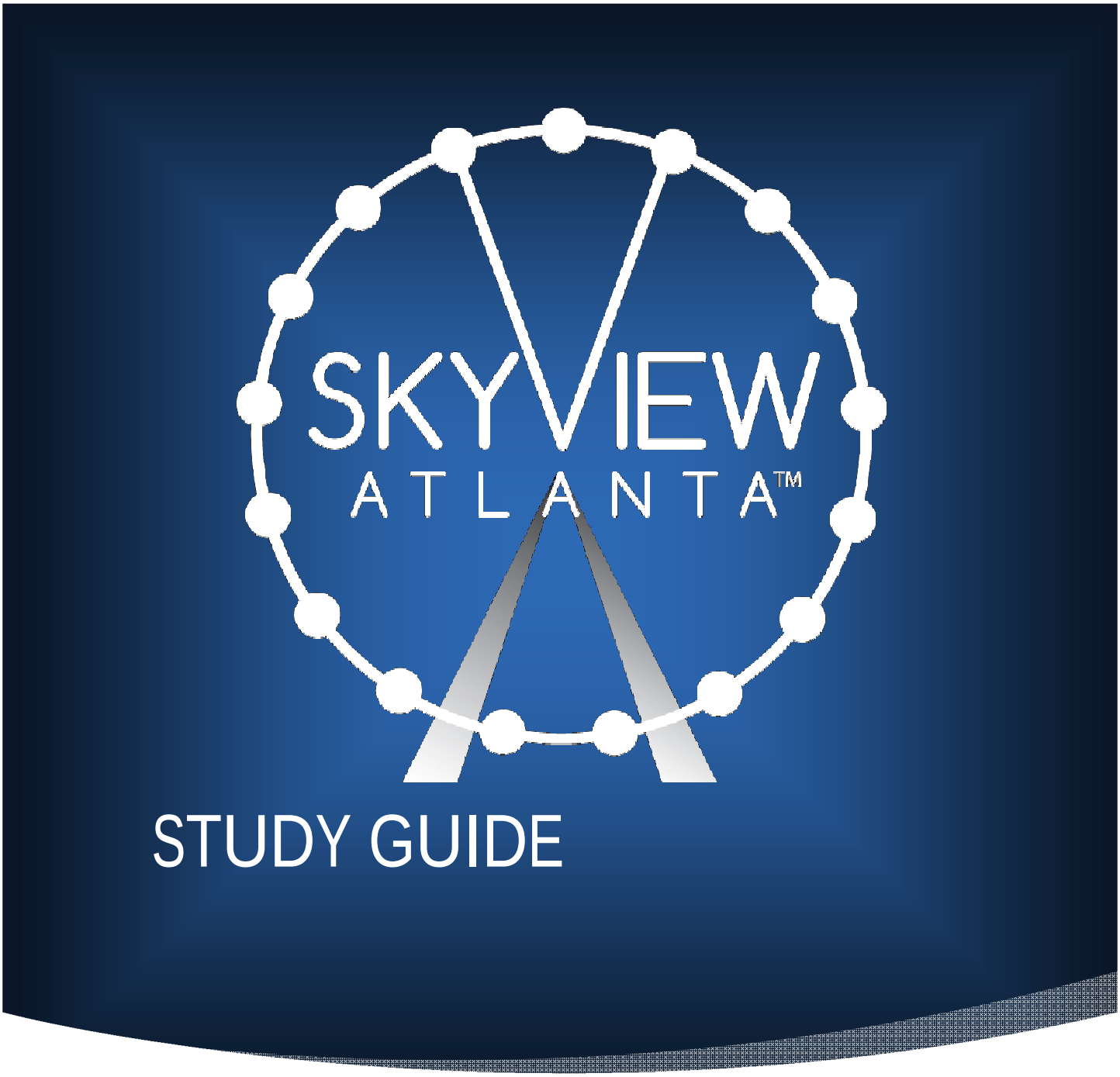


STUDY GUIDE

STEAM Classroom Activities and Project-Based Lesson Plans
For Grades 3-5 and 6-8

SkyView Atlanta
Study Guide

Table of Contents

Content created by TurnKey Education, Inc. for SkyView Partners, LLC.
TurnKey Education, Inc.: www.turnkeyeducation.net

What to Expect on Your Field Trip

At SkyView Atlanta, your class will learn as they fly 200 feet above the ground! Featuring 42 climate-controlled gondolas, SkyView Atlanta's observation wheel soars almost 20 stories above Centennial Olympic Park. This spectacular panoramic view of Atlanta—and beyond—is unforgettable. Keep an eye out for Kennesaw Mountain, home to some of the early settlers of North Georgia, and Mercedes Benz Stadium, home to the Atlanta Falcons and Atlanta United.

Every field trip to SkyView includes a personally guided conversation about how the wheel works. This experience stresses technology, physics, geometry, and design in ways that bring these abstract concepts into real world focus. In addition to lunch options available at the walk-up Chick-fil-A®, all students receive a free, professional photo to remember their whirlwind field trip experience.

The story of SkyView begins in 1893 when George Ferris built the first wheel of this kind for the World's Fair in Chicago. At the time, he owned a company that tested iron and steel for railroads and bridges. He used his knowledge of engineering and design to make a steel structure that would amaze visitors to the exposition and rival the Eiffel Tower, which made its debut four years earlier at the World's Fair in Paris.

The wheel Ferris designed had 36 wooden cars that could each hold up to 60 riders. It was lit up by 3,000 of Thomas Edison's newest invention, the light bulb. As you can imagine, the first Ferris wheel was a huge success.

Now, over 120 years later, SkyView Atlanta continues to educate and entertain. This spinning classroom is the ideal setting for your students to experience science, technology, art, engineering, and math in an engaging way that complements your daily instruction. Come to SkyView and take STEAM learning to new heights!

Using this Study Guide

As a companion to your experience at SkyView Atlanta, this Study Guide has been created to complement your classroom instruction and make the most of your school field trip. It contains original, assessable, STEAM-related classroom lesson plans for two levels – Elementary and Middle School. It is designed to be flexible and used to best meet the needs and capabilities of your class. You know your students better than anyone else!

Following this Introduction, you will find **"Take Flight,"** a section containing six interdisciplinary classroom lesson plans and project-based inquires; three for each level. The lesson plans begin with instruction pages for teachers including a list of the appropriate content areas and skills addressed by the activities in the lesson. Rounding out the lessons are ready-to-copy Student Activity pages that center on key STEAM topics featured during your class visit.

Elementary School, Grades 3-5

In the first lesson, **Build-A-Wheel Workshop**, students work as teams of engineers in an open-ended design challenge to build their own observation wheel, followed by questions about the forces at work that keep these wheels turning and the passengers safe. **Wheels Around America** compares and contrasts

observation wheels located throughout the country, including SkyView in Atlanta, using measurement and geography skills. **Spin Through Time** is a lesson about math, geometry, and local history. Students will examine maps to see what the vicinity where SkyView stands today looked like in 1871, 1892, and 1919.

Middle School, Grades 6-8

In a lesson called **Past and Present**, students calculate and compare the dimensions of the 1895 Phoenix Wheel in Piedmont Park with the SkyView observation wheel of today. They will then design themed gondolas for a hypothetical SkyView flight commemorating the bicentennial of Atlanta in 2037. For **Working on the Wheel,** students use their critical thinking skills to solve a puzzle that matches three students with their desired careers working with observations wheels like SkyView. Logic puzzles are a fun way to practice mathematical skills without using any numbers! The third lesson, **Around the World**, compares data sets on 15 of the world's largest wheels. Students also practice their map and globe skills with absolute location.

In **"An Extra Turn,"** there are **Gondola Games** featuring student puzzles for use as extra credit or to complete on your bus ride. **Wheel of Time** outlines significant moments in the development of the Ferris wheel, from its renowned beginning in Chicago to the modern-day marvels known around the world as observation wheels. **The Man Behind the Wheel** provides a list of recommended biographies of George Washington Gale Ferris, Jr.

We know how important it is to justify field trips and document how instructional time is spent outside of your classroom. To that end, this Study Guide is directly correlated to the Common Core State Standards for English Language Arts and Mathematics, the C3 Framework for Social Studies State Standards, Next Generation Science Standards, and, for middle school, the National Core Arts Standards. These correlations, listed in **"Observations,"** are organized by grade level and content. You can readily see how they fit into your required curriculum, making it easy to connect a field trip to SkyView Atlanta with your classroom instruction. Following the national curricula, you will find the Georgia Standards of Excellence.

When you get back to school, refer to this Study Guide as you continue to explore connections between the themes of your visit and your classroom STEAM instruction. You will learn a lot from a flight over Atlanta!

Grades 3-5

Lesson 1: Build-a-Wheel Workshop

Teacher Instructions

One afternoon in 1892, while dining with some fellow engineers, George Washington Gale Ferris described a giant wheel he wanted to build for the World's Fair the following year in Chicago. He quickly sketched his design, but his friends did not believe him. Ferris built bridges for a living and no one could fathom the tall, bicycle-type wheel he envisioned for people to ride on. They called him the "man with the wheels in his head" because his plan sounded impossible to build at all, much less in the few months left before the fair opened.

Ferris, of course, got the wheels out of his head and the first giant observation wheel became a reality. Your students will work in groups as teams of engineers in an open-ended design challenge to build their own observation wheel, although on a much smaller scale than that first one from 1893 or SkyView Atlanta built in 2013. Their task is to plan, build, and test a rotating model wheel using the materials provided. Each wheel must be able to stand on its own, rotate around a central axis, and include at least six miniature gondolas that won't dump out the "passengers" as they ride around the wheel.

The Design Challenge Form in Part 1 of the Student Activity pages guides each team through the process. Students will need to keep track of the supplies used, ideas rejected, problems faced along the way, and the solutions found for those problems. At the end of the design challenge, each group of engineers will demonstrate their model to the class. In Part 2, students will answer questions about the forces at work that keep these wheels turning and the passengers safe.

Only provide the tools you feel are safe for your students to use. You can limit or add to the recommended supply list on the following page. The students' instructions include a few hints to get them started.

- The triangle is the strongest shape.
- Leave a space for the axle in the center of each wheel where the spokes meet.
- Crossbars are needed to connect two circles into a wheel.
- Gondolas should stay upright as the wheel rotates.
- There is no single correct design.

Students will need time at the start of the project to experiment—and fail—with their designs and materials before they settle on the best plan for their team. For classes who need more guidance, one of the easiest models is made mostly from the popsicle sticks. Students can form triangles into two hexagons for the wheels, a divided rectangle for a base, and a triangle with extended sides to support an axle. This plan requires about 50 sticks per wheel, plus a skewer, wire, or unfolded paper clip as an axle.

Recommended supplies and tools:

For the wheel and base:

- Craft/popsicle sticks
- Pipe cleaners
- Straws
- Adhesives: glue gun, white school glue, tape
- Small and large paper clips
- Hair/bobby pins
- Paper plates
- Bamboo skewers
- String
- Wire
- Scissors
- Wire cutters
- Needle-nose pliers
- Rulers and tape measurers

For the gondolas and "passengers" (in addition to the supplies already listed):

- Mini muffin/cupcake liners
- Egg cartons cut apart for individual cups
- Small (1-2 ounces) paper or plastic cups
- Pennies, marbles, small erasers, or miniature figurines to serve as passengers

---

Answer Key

Part 1: Assess for completion of the total of 30 points based on the design challenge form.

- Materials: 5 points
- Sketch: 5 points
- Rejected idea: 5 points
- Problem and solution: 5 points
- Design criteria: 6 points
- What to do differently: 4 points

Part 2:

1. Wheel and axle
2. Gravity
3. Students turn it themselves, by hand.
4. The wheel will be unbalanced and won't spin properly.
5. Answers will vary based on wheel designs, but make sure the passengers remain "seated."
6. Answers may vary but should recognize that the gondolas opposing each other need to be loaded first to keep the wheel balanced.

Name Class Date

Build-a-Wheel Workshop

Student Activity

One afternoon in 1892, while dining with some fellow engineers, George Washington Gale Ferris described a giant wheel he wanted to build for the World's Fair the following year in Chicago. He quickly sketched his design, but his friends did not believe him. Ferris built bridges for a living and no one could fathom the tall, bicycle-type wheel he envisioned for people to ride on. They called him the "man with the wheels in his head" because his plan sounded impossible to build at all, much less in the few months left before the fair opened.

Ferris, of course, got the wheels out of his head and the first giant observation wheel became a reality. Your team of engineers will design and build your own observation wheel, although on a much smaller scale than that first one from 1893 or SkyView Atlanta built in 2013. Your challenge is to plan, build, and test a rotating model observation wheel using the materials provided by your teacher. Your wheel must be able to stand on its own, rotate around a central axis, and include at least six miniature gondolas that won't dump out your "passengers" as they ride around the wheel.

The form on the next page will guide your design process. Keep track of the supplies you use, ideas that were rejected, problems your team faced along the way, and the solutions you found. Once your wheel is built, you will demonstrate it to the class. Finally, you will answer questions about the forces at work that keep these wheels turning and the passengers safe.

Here are a few hints to help your team get started.

- The triangle is the strongest shape.
- Leave a space for the axle in the center of each wheel where the spokes meet.
- Crossbars are needed to connect two circles into a wheel.
- Gondolas should stay upright as the wheel rotates.
- There is no single correct design.

Terms to Know: *axis, axle, crossbar, fathom, gondola, pivot, spokes, torque*

Part 1

Once your group decides on a plan for your model observation wheel, complete the form on the next page.

Name Class Date

Design Challenge: Build a rotating miniature observation wheel with gondolas	
Materials (5 points):	Sketch (5 points):
One idea we did not use and the reason we rejected it (5 points):	
One problem we encountered with our design and the solution we found (5 points):	
Design criteria: check yes or no (2 points each) • Our wheel stands on its own: □ yes □ no • Our wheel rotates: □ yes □ no • Passengers remain safely in their gondola as our wheel turns: □ yes □ no	
Something we would do differently if we redesigned our wheel (4 points):	

Name Class Date

Part 2

1. Which simple machine did you build as part of this design challenge?

2. What is the name of the force that continually pulls the gondolas and passengers towards the Earth?

3. Torque is the force applied to an object to make it pivot around a central axis. Four large engines provide the torque to rotate SkyView. What is the source of the torque applied to your model wheel?

4. What happens if only the gondolas on one side of the wheel are filled with passengers? Try it out on your model wheel!

5. (a.) How much time does it take for your wheel to complete one revolution at its safest top speed? (All riders must stay in their seats!) (b.) How many times can your passengers go completely around during a ride that lasts no more than five minutes?

6. What is the best way to load passengers on an observation wheel if you are starting with empty gondolas?

Grades 3-5

Lesson 2: Wheels Around America

Teacher Instructions

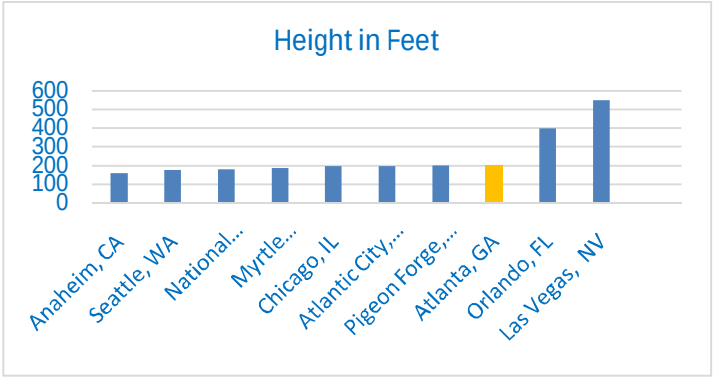
SkyView is the largest, transportable, observation wheel in the United States. It arrived in Atlanta in 2013, divided into sections and packed into semi-trailer trucks. Piece by piece, the wheel was reconstructed at the site your class will visit on your field trip.

Because it is transportable, the wheel is held in place by weight instead of by anchors or pillars sunk into the Earth. Six water tanks that hold over 13,000 gallons of water each and 48 steel plates that weigh 2,500 pounds each keep SkyView secure to the ground. Multiplied and added together, that means the total weight of the base is nearly 230,000 pounds! The weight of water tanks and plates serve as ballast to help counteract the effects of extreme winds.

How does SkyView compare to some of the other wheels around the country? The chart in Part 1 lists ten cities in the United States with observation wheels, including Atlanta. All the wheels on the list opened within a few years of SkyView. Your students will compare the heights of these wheels and will need separate paper to make a bar graph. Part 2 of the activity reviews your students' geography skills using these same ten cities. They will need to reference a map of the United States that includes cities.

Answer Key

Part 1

1. c. By height from shortest to tallest
2. Seattle = 180 ft
3. Myrtle Beach = 190 ft
4. Chicago = 200 ft
5. Anaheim = 200 ft
6. Atlantic City = 200 ft
7. Las Vegas = 600 ft
8. 6/10 = 3/5
9. 

10. 200 ft (Atlanta) > 175 ft (Seattle)
11. 200 ft (Atlanta) < 550 ft (Las Vegas)
12. 200 ft (Atlanta) = 200 ft (Pigeon Forge)

Part 2

1. California
2. Florida
3. Georgia
4. Illinois
5. Maryland
6. New Jersey
7. Nevada
8. South Carolina
9. Tennessee
10. Washington
11. Pigeon Forge, TN
12. Seattle, WA
13. Seattle, WA, and Anaheim, CA
14. National Harbor, MD; Myrtle Beach, SC; Chicago, IL; Atlantic City, NJ; Pigeon Forge, TN; Atlanta, GA; Orlando, FL
15. Answers will vary depending on students' individual experiences.

Name Class Date

Wheels Around America

Student Activity

SkyView is the largest, transportable, observation wheel in the United States. It arrived in Atlanta in 2013, divided into sections and packed into semi-trailer trucks. Piece by piece, the wheel was reconstructed at the site your class will visit on your field trip.

Because it is transportable, the wheel is held in place by weight instead of by anchors or pillars sunk into the Earth. Six water tanks that hold over 13,000 gallons of water each and 48 steel plates that weigh 2,500 pounds each keep SkyView secure to the ground. Multiplied and added together, that means the total weight of the base is nearly 230,000 pounds! The weight of water tanks and plates serve as ballast to help counteract the effects of extreme winds.

How does SkyView compare to some of the other wheels around the country? The chart in Part 1 lists ten cities in the United States with observation wheels, including Atlanta. All the wheels on the list opened within a few years of SkyView. You will compare the heights of these wheels and you will need separate paper to make a bar graph. Part 2 of the activity reviews your geography skills using these same ten cities. You will need a map of the United States that includes cities.

***Terms to Know**: abbreviation, ballast, gondola, observation, transportable*

The first giant observation wheel in the United States was the original Ferris wheel in 1893 (left). It rose 264 feet over Chicago—that's even higher than SkyView! (Library of Congress Prints and Photographs Division)

Name _____ Class _____ Date _____

Part 1

This chart lists ten observation wheels in the United States, including SkyView in Atlanta. These wheels opened within a few years of SkyView, which launched in 2013. Use the information in the chart to answer the questions that follow.

City	State	Name of Wheel	Height in Feet
Anaheim	CA	Mickey's Fun Wheel	160
Seattle	WA	Seattle Great Wheel	175
National Harbor	MD	Capital Wheel	180
Myrtle Beach	SC	SkyWheel Myrtle Beach	187
Chicago	IL	Navy Pier	196
Atlantic City	NJ	Steel Pier Ferris Wheel	197
Pigeon Forge	TN	Great Smokey Mountain Wheel	200
Atlanta	GA	SkyView	200
Orlando	FL	Orlando Eye	400
Las Vegas	NV	High Roller	550

1. In which order are the wheels listed in the chart?
   a. Alphabetically by their cities
   b. Alphabetically by their states
   c. By height from shortest to tallest
   d. By height from tallest to shortest

Round the height to the nearest ten for the wheels in these locations:

2. Seattle, WA _____

3. Myrtle Beach, SC _____

4. Chicago, IL _____

Round the height to the nearest hundred for the wheels in these locations:

5. Anaheim, CA _____

6. Atlantic City, NJ _____

7. Las Vegas, NV _____

Name _____ Class _____ Date _____

8. Six of the 10 observation wheels have 42 gondolas. Write a fraction that shows how many of the wheels on the list have 42 gondolas. Don't forget to reduce to find an equivalent fraction!

_____

9. On separate paper, make a bar graph to compare the heights on the wheels in the 10 cities in the chart. Highlight the column for SkyView on your graph.

Write a number sentence with < (less than), > (greater than), or = (equal to) to compare the height of SkyView in Atlanta to the heights of the observation wheels in these three cities:

10. Seattle, WA _____

11. Las Vegas, NV _____

12. Pigeon Forge, TN _____

Name _____ Class _____ Date _____

Part 2

Use the list of cities in the chart from Part 2 to review your United States geography skills. You will need a U.S. map with cities marked on it.

How well do you know the short form for these states? Write out the full name of the state for each abbreviation:

1. CA _____
2. FL _____
3. GA _____
4. IL _____
5. MD _____
6. NJ _____
7. NV _____
8. SC _____
9. TN _____
10. WA _____

Locate each city on the map of the United States to answer these questions. Include both the city and the state with your answers.

11. Which city is closest to Atlanta? _____

12. Which city is the farthest from Atlanta? _____

13. Which cities are on the coast of the Pacific Ocean?

_____

14. Which cities are east of the Mississippi River?

_____

15. Have you ridden an observation wheel or a Ferris wheel in a state that is not on this list? If so, where?

_____

Grades 3-5

Lesson 3: Spin Through Time

Teacher Instructions

At 200 feet above the ground, the views from SkyView are amazing. During the flight, your class will spot places of natural and historical importance, from Kennesaw Mountain northwest of Atlanta to Centennial Olympic Park directly below. How many of these locations will your students recognize? In the first part of this lesson, they will solve computation problems and study the geometry of the giant wheel that carries them almost as high as a 20-story building. Math has never been so breathtaking!

What if your gondola turned into a time machine and your students could see the same view from different periods in the history of Atlanta? What would the scenes look like? When would the Atlanta we know today start to look familiar? Cities in the U.S. grew quickly at the turn of the twentieth century, including Atlanta. New businesses and industries provided jobs for rural workers leaving their farms and immigrants leaving their homelands. Atlanta's growth was especially remarkable because the city was destroyed during the Civil War. Retreating Confederate soldiers ruined anything the Union might have found useful and Sherman's troops burned what was left in November of 1864.

Part 2 features four maps of Atlanta, including one drawn less than a decade after the end of the Civil War depicting the area already in a state of rebuilding. Working in groups of four, students will examine these maps to see what the vicinity where SkyView stands today looked like in 1871, 1892, and 1919. These historic maps are available in their entirety online from the Library of Congress:

- 1871: www.loc.gov/resource/g3924a.pm001210/
- 1892: www.loc.gov/resource/g3924a.pm001220/
- 1919: www.loc.gov/resource/g3924a.pm001230/

Answer Key

Part 1

1. 600 seconds
2. 6 flights
3. 251; 200+50+1; two hundred fifty-one
4. Check diagram for height
5. Check diagram for diameter
6. 34 ft
7. Check diagram for radius
8. 83 ft
9. 21
10. Acute

Part 2

1. Lucky
2. Check 1892 map for Spring Street, running perpendicular to Walton, Luckie, and James
3. Williams
4. Marietta, Forsyth, Ellis, or Walton/Wolton Streets
5. 1871, 1892
6. It is more crowded. There are commercial buildings where there used to be homes, with new kinds of businesses going into taller buildings.
7. Tabernacle
8. Centennial Olympic Park
9. Homes and open spaces/fields
10. SkyView is north of Spring Street and west of Luckie, at the point where Luckie veers northwest

	1871	1892	1919
U.S. President	Ulysses S. Grant	Benjamin Harrison	Woodrow Wilson
U.S. Vice President	Schuyler Colfax	Levi P. Morton	Thomas R. Marshall
# of States in the U.S.A.	37	44	48
Most recent amendment	15th	15th	18th

Name Class Date

Spin Through Time

Student Activity

At 200 feet above the ground, the views from SkyView are amazing. During your flight, you will spot places of natural and historical importance, from Kennesaw Mountain northwest of Atlanta to Centennial Olympic Park right below you. How many places do you recognize? In the first part of this lesson, they will solve computation problems and study the geometry of the giant wheel that carries them almost as high as a 20-story building. Math has never been so breathtaking!

What if your gondola turned into a time machine and you could see the same view from different periods in the history of Atlanta? What would the scenes look like? When would the Atlanta we know today start to look familiar?

Cities in the U.S. grew quickly at the turn of the twentieth century, including Atlanta. New businesses and industries provided jobs for rural workers leaving their farms and immigrants leaving their homelands. Atlanta's growth was especially remarkable because the city was destroyed during the Civil War. Retreating Confederate soldiers ruined anything the Union might have found useful and Sherman's troops burned what was left in November of 1864.

Part 2 features four maps of Atlanta, including one drawn less than a decade after the end of the Civil War depicting the area already in a state of rebuilding. You will examine these maps to see what the vicinity where SkyView stands today looked like in 1871, 1892, and 1919.

***Terms to Know**: capacity, decade, diameter, gondola, immigrants, industries, maximum, radius, residential, rural, vicinity*

Name Class Date

Part 1

Solve these math problems using facts about SkyView.

1. One flight on SkyView takes an average of 10 minutes, including loading and unloading passengers. What is the length of a flight in seconds?

2. How many flights can be made in one hour?

3. SkyView has 42 gondolas. One of the gondolas holds five people while the other 41 gondolas hold six people. What is the maximum number of passengers that can be on SkyView at one time? Write your answer in standard form, expanded form, and word form.

4. SkyView is 200 feet tall. The height of an observation wheel is the distance from the ground to the highest point on the wheel. Draw and label the height on the diagram of SkyView on the next page.

5. The diameter of SkyView is 166 feet. The diameter of a circle is the length of a straight line drawn from a point on the edge of the circle, through the center, to a point opposite the first on the edge of the circle. Draw and label a diameter on the diagram of SkyView on the next page.

6. Find the difference between the height and the diameter of SkyView.

7. A radius is half the length of the diameter. It is a ray—a straight line drawn from the center of the circle to a point on the outer edge. What is the length of the radius for SkyView?

Name Class Date

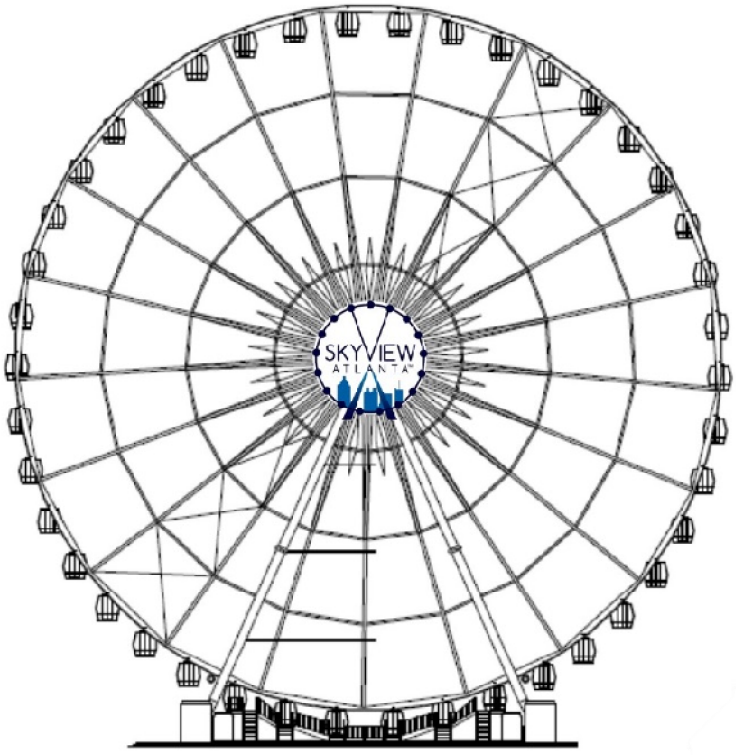
8. Draw a radius on the diagram of SkyView.

9. A sector of a circle is the wedge shape formed by two rays. (It looks like a piece of pie or slice of pizza!) How many sectors does SkyView have?

_____

10. Look at the angle of a sector at the center of the wheel in the diagram. Are the central angles acute, obtuse, or right angles?

_____



Name Class Date

Part 2

Many streets in downtown Atlanta have changed names over the years. Cain Street became Andrew Young International Boulevard. Ted Turner Drive was once called Spring Street. Harris Street is now named for John Portman, a famous local architect. How else has the area around SkyView changed? Your group will compare maps of Atlanta from 1871, 1892, 1919, and today to find out. Read the questions first to help you know what to look for as you examine each map.

1. Highlight Luckie Street on each of the four maps. How is it spelled on the map from 1919?

2. Spring Street/Ted Turner Drive appears on all four of the maps, but it is not named on the map from 1892, which is when we first see it extended south of Cain Street. Locate and label Spring Street on the 1892 map.

3. Find James Street on the maps from 1871 and 1892. What is it called today?

4. In addition to Luckie Street, identify a street whose name has not changed since 1871.

5. Which maps show this area of Atlanta as mostly residential?

6. How does the map from 1919 reflect the growth of cities made possible by new technology and new industries?

7. Which building located behind SkyView today also appears on the map from 1919?

Name Class Date

8. What is the name of the road that intersects Marietta and marks the ends of Luckie Street and Walton Streets today? It does not appear under any name on the earlier maps.

9. Find the Fountain of Rings in Centennial Olympic Park on the modern map. What was located here in 1871, 1892, and 1919?

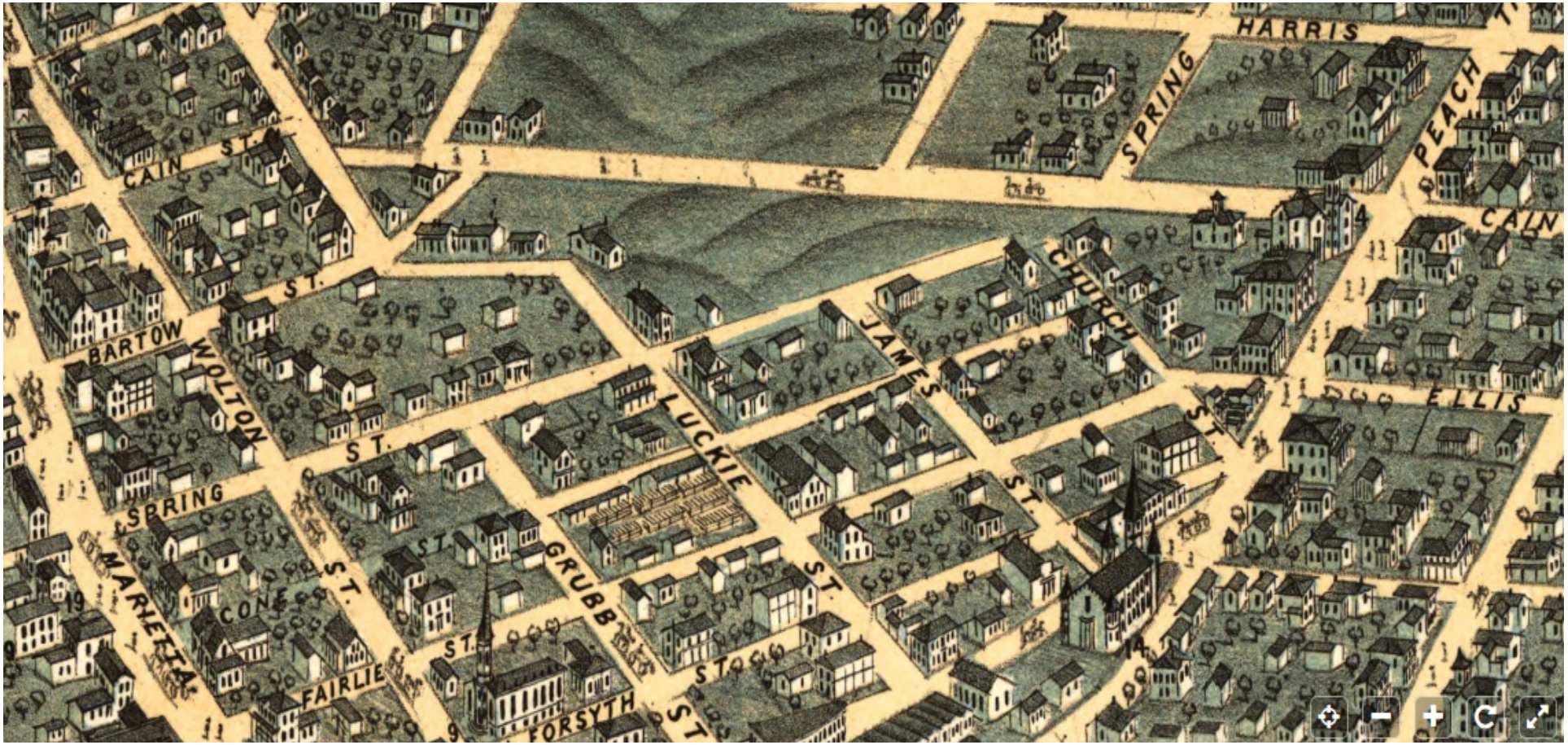
10. Mark the location on Luckie Street where SkyView stands today on the maps from 1871, 1892, and 1919.

To complete your historic comparison of 1871, 1892, 1919, and today, use your Social Studies book or an almanac to fill in this chart.

	1871	1892	1919	Today
U.S. President				
U.S. Vice President				
Number of States in the U.S.A.				
Most recently ratified amendment to the Constitution				

Name Class Date

Atlanta in 1871



Name Class Date

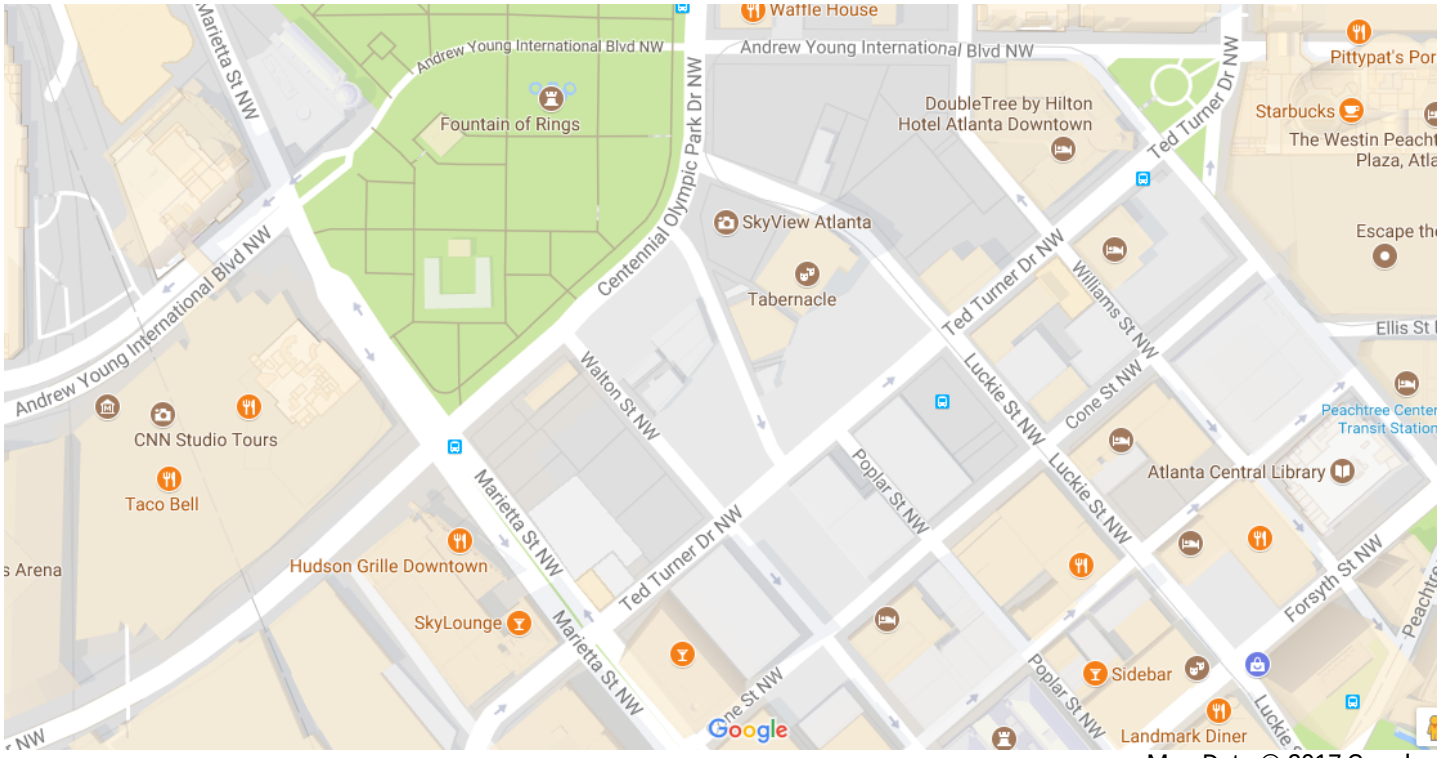
Atlanta in 1892

Name Class Date

Atlanta in 1919

Name Class Date

Atlanta Today



Map Data © 2017 Google

Observations: Curriculum Standards

Grades 3-5

We know how important it is for you to justify field trips and document how instructional time is spent outside of your classroom. Both the activities in this Study Guide and the experiences your students have during their field trip to SkyView Atlanta are correlated to the Common Core State Standards for English Language Arts and Mathematics along with the C3 Framework for Social Studies State Standards and the Next Generation Science Standards.

The connections are arranged by content area and grade level. Following the national curricula, you will find the Georgia Standards of Excellence to assist with your planning needs.

NATIONAL CURRICULUM CORRELATIONS

Next Generation Science Standards

Grade 3: 3-PS2-1, 3-PS2-2
Grade 5: 5-PS2-1
Grades 3-5: 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3

C3 Framework for Social Studies State Standards

By the end of Grade 5: D2.Geo.2.3-5, D2.Geo.5.3-5, D2.Geo.6.3-5, D2.Geo.11.3-5

Common Core State Standards for Mathematics

Grade 3: CCSS.Math.Content.3.OA.D.8, CCSS.Math.Content.3.NBT.A.1, CCSS.Math.Content.3.NF.A.1, CCSS.Math.Content.3.MD.A.1, CCSS.Math.Content.3.MD.A.3
Grade 4: CCSS.Math.Content.4.OA.A.3, CCSS.Math.Content.4.NBT.A.2, CCSS.Math.Content.4.NBT.A.3, CCSS.Math.Content.4.NF.A.1, CCSS.Math.Content.4.MD.A.1, CCSS.Math.Content.4.MD.A.2, CCSS.Math.Content.4.MD.C.5, CCSS.Math.Content.4.G.A.1
Grade 5: CCSS.Math.Content.5.NBT.B.5, CCSS.Math.Content.5.MD.A.1
Standards of Mathematical Practice: 1, 2, 4, 6

Common Core State Standards for English Language Arts

Grade 3: CCSS.ELA-Literacy.RI.3.3, CCSS.ELA-Literacy.RI.3.4, CCSS.ELA-Literacy.RI.3.7, CCSS.ELA-Literacy.SL.3.4
Grade 4: CCSS.ELA-Literacy.RI.4.3, CCSS.ELA-Literacy.RI.4.4, CCSS.ELA-Literacy.RI.4.7, CCSS.ELA-Literacy.SL.4.4
Grade 5: CCSS.ELA-Literacy.RI.5.3, CCSS.ELA-Literacy.RI.5.4, CCSS.ELA-Literacy.RI.5.7, CCSS.ELA-Literacy.SL.5.4

GEORGIA STANDARDS OF EXCELLENCE

Science
Grade 4: S4P3a, S4P3b, S4P3c

Social Studies
Grade 3: SS3G1
Grade 4: SS4G1
Grade 5: SS5H1, SS5G2
Map and Globe Skills: 7, 8, 19, 11
Information Processing Skills: 1, 7, 9, 11

Mathematics
Grade 3: MGSE3.OA.8, MGSE3.NBT.1, MGSE3.NF.1, MGSE3.MD.1, MGSE3.MD.3
Grade 4: MGSE4.OA.3, MGSE4.NBT.2, MGSE4.NBT.3, MGSE4.NF.1, MGSE4.MD.1, MGSE4.MD.2, MGSE4.MD.5, MGSE4.G.1
Grade 5: MGSE5.NBT.5, MGSE5.MD.1
Standards of Mathematical Practice: 1, 2, 4, 6

English Language Arts
Grade 3: ELAGSE3RI3, ELAGSE3RI4, ELAGSE3RI7, ELAGSE3SL4
Grade 4: ELAGSE4RI3, ELAGSE4RI4, ELAGSE4RI7, ELAGSE4SL4
Grade 5: ELAGSE5RI3, ELAGSE5RI4, ELAGSE5RI7, ELAGSE5SL4

Grades 6-8

Lesson 1: Past and Present

Teacher Instructions

Over a hundred years before SkyView began rotating passengers 200 feet over Atlanta, another wheel did the same thing. In 1895, Atlanta was host to the Phoenix Wheel. This version of the Ferris wheel was made by the Phoenix Steel Company in Pennsylvania. They only made four wheels and one of them was the star attraction in Piedmont Park at the 1895 Cotton States Exposition held in Atlanta. The purpose of the fair was to promote industry and culture in the southern states.

The Cotton States Exposition was a chance for Georgia to show the world that, according to Henry Grady, "The new South presents a perfect democracy, the oligarchs leading in the popular movement—a social system compact and closely knitted, less splendid on the surface, but stronger at the core." Less than 30 years after the Civil War ended, Atlanta was rebuilding and rebranding itself as the center of a "New South" based on commerce and industry, as described by Grady, the editor of the Atlanta *Constitution*.

How do the Phoenix Wheel of 1896 and SkyView of today compare? Your students will use data provided on both wheels to calculate and answer questions about their dimensions. In the second part of this activity, students have a chance to memorialize other aspects of Atlanta's past and present by designing a gondola to reflect a theme of their choice from current or historical life in the city's metropolitan area.

Answer Key

Part 1

1. 118 years
2. (a.) 1:1, (b) 1:1.3
3. Answers will vary and might mention that the space between the ground and the bottom of the wheel must have been greater for the Phoenix Wheel.
4. SkyView
5. No. The Phoenix Wheel held 12-14 people per gondola, while SkyView holds 5-6 each. However, there are many more gondolas on SkyView than there were on the Phoenix Wheel.
6. r = 62.5 ft, c = 392.7 ft
7. r = 83 ft, c = 521.5 ft
8. They have the same ratio as the diameters of the wheels (1:1.3) because they are equivalent ratios.
9. (a.) 12.4 ft, (b.) 24.8 ft
10. (a.) 4.74 feet per second, (b.) 3.23 mph
11. 3 hours

12. The velocity on one of the inner circles would be less because the distance—the circumference—traveled in the same amount of time is less.
13. 17.14°; the central angle for SkyView is less than the Phoenix Wheel because SkyView has more sectors that need to share the 360° of the circle. The Phoenix Wheel has 12 sectors, each with a central angle of 30°.
14. A line drawn straight across through the center of the circle
15. Half the diameter
16. Linear distance around the outer edge of the circle
17. One of the pie-wedges in the circle
18. The angle of one of the sectors
19. Linear distance on the outer edge of the circle between the points made by the two rays of a sector
20. Students should realize that the wheel could not rotate evenly if the weight is not distributed around the circle.

Part 2: Assess for completion out of 25 possible points

- Topic (1 point)
- Reason for that choice (2 points)
- Paragraph on the significance of the choice to the city of Atlanta (5 points)
- Identify a color scheme of two to four colors that will be used predominantly throughout the design (3 points)
- Select four photos or images to use in the design (4 points)
- Sketch of how the exterior of the themed gondola will appear (5 points)
- Sketch of the interior of the themed gondola (5 points)

Name Class Date

Past and Present

Student Activity

Over a hundred years before SkyView began rotating passengers 200 feet over Atlanta, another wheel did the same thing. In 1895, Atlanta had the Phoenix Wheel. This version of the Ferris wheel was made by the Phoenix Steel Company in Pennsylvania. They only made four wheels and one of them was the star attraction in Piedmont Park at the 1895 Cotton States Exposition held in Atlanta. The purpose of the fair was to promote industry and culture in the southern states.

The Cotton States Exposition was a chance for Georgia to show the world that, according to Henry Grady, "The new South presents a perfect democracy, the oligarchs leading in the popular movement—a social system compact and closely knitted, less splendid on the surface, but stronger at the core." Less than 30 years after the Civil War ended, Atlanta was rebuilding and rebranding itself as the center of a "New South" based on commerce and industry, as described by Grady, the editor of the Atlanta *Constitution*.

How do the Phoenix Wheel of 1896 and SkyView of today compare? You will use data provided on both wheels to calculate and answer questions about their dimensions. In the second part of this activity, you have a chance to memorialize other aspects of Atlanta's past and present by designing a gondola to reflect a theme of your choice from current or historical life in the city's metropolitan area.

A view of the Cotton States Exposition from the Phoenix Wheel, looking northeast, at Piedmont Park in 1895. (Library of Congress Prints and Photographs Division)

Name Class Date

Terms to Know: *arc, bicentennial, capacity, circumference, commerce, diameter, exposition, gondola, hemisphere, metropolitan, oligarchs, radius, sector, velocity*

Part 1

Use this chart to answer questions that follow.

Name	Phoenix Wheel	SkyView
Location in Atlanta	Piedmont Park	Centennial Olympic Park
Year open	1895	2013
Height of the wheel	200 ft	200 ft
Diameter of the wheel	125 ft	166 ft
Number of circle sectors	12	21
Number of gondolas	12	42
Riders per gondola	12-14 people	5-6 people

1. How many years passed between when Atlanta's first big wheel, the Phoenix Wheel, was here and when Skyview opened?

2. (a.) What is the ratio of the heights of the two wheels? (b.) What is the ratio of the diameters?

3. What reason might explain why the wheels have the same height but different diameters?

4. Which wheel has two gondolas per circle sector?

5. Does the wheel with larger gondolas have a greater total capacity? Explain.

6. What was the radius and circumference of the Phoenix Wheel?

Name Class Date

7. What is the radius and circumference of SkyView?

8. How do the ratios of the wheels' radii and circumferences represent a proportional relationship?

9. (a.) How long is the arc between two gondolas on SkyView? In other words, how far apart are the gondolas spaced around the wheel? (b.) How long is the arc for each sector?

10. It takes SkyView approximately one minute and 50 seconds to complete one revolution. (a.) If it remained constant, what would be the velocity of a person on board as the wheel makes one revolution, in feet per second? (b.) In miles per hour?

11. If your school is 10 miles from SkyView, how long would it take to drive there for your field trip at the velocity you calculated above in #10? Round your answer to the nearest whole hour.

12. If the gondolas were hung around one of the circle frames closer to the center of the wheel, would a passenger's velocity be less or greater than it is at the current diameter? Why?

13. What is the center angle for the sectors of SkyView? Is it greater or less than the sectors' central angle on the Phoenix Wheel? Why?

Name Class Date

On the SkyView diagram below, identify and label the following parts. If they are not included on the diagram, draw them in.

14. diameter

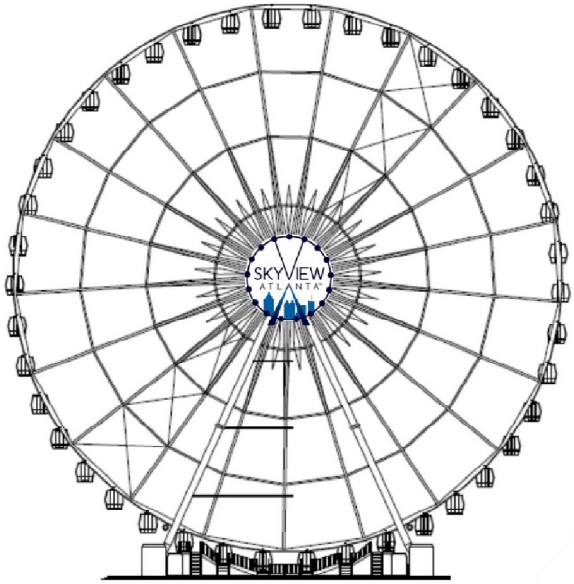
15. radius

16. circumference

17. a sector

18. a central angle

19. an arc for one sector



20. If there were not enough passengers to fill each gondola, would do you think would happen if only the gondolas on one hemisphere of the circle were filled? Why?

_____

_____

_____

Part 2

While the Phoenix Wheel offered views of Atlanta from the same height as SkyView, it is not the same scene you will observe during your field trip. During your flight, you will spot places of natural and historical significance from Kennesaw Mountain northwest of Atlanta to Centennial Olympic Park right below you.

The history of Atlanta goes back to 1837, when the city was founded where the railroad lines met and called "Terminus." For its upcoming bicentennial, your class has been chosen to design themed gondolas for a commemorative SkyView flight in 2037. Select a theme from the list on the next page or use your own idea. Your topic should reflect some aspect of current or historical life in the metro-Atlanta area.

Theme Suggestions:

Atlanta Braves
Atlanta Hawks
Atlanta United
Atlanta Falcons
Atlanta Dream
Atlanta Symphony Orchestra
Atlanta Ballet
Spelman College
Clark Atlanta University
Morehouse College
Georgia Tech
Georgia State
Emory University
Oglethorpe University
1996 Olympics
Native Americans - Cherokee, Creek
American Civil War
Civil Rights Movement
1895 Cotton States Exposition
Great Atlanta Fire of 1917
Orly Air Crash of 1962
Booker T Washington's Atlanta Compromise Speech
John Lewis
Margaret Mitchell
Jimmy Carter
Maynard Jackson
Lugenia Burns Hope
Martin Luther King, Jr.
Alonzo Herndon
Benjamin Mays
Andrew Young
Julian Bond
Joel Chandler Harris
Centennial Olympic Park
Piedmont Park
Grant Park
Inman Park
Zoo Atlanta
Cyclorama
Beltline
Georgia Aquarium
CNN
Coca-Cola
Chick-fil-A
The Varsity
Hip hop
Children's Healthcare of Atlanta
Sweet Auburn
Chattahoochee River
Stone Mountain
Kennesaw Mountain
Oakland Cemetery
Fox Theatre
Atlanta Botanical Garden
Ebenezer Baptist Church
Atlanta History Center
High Museum of Art
College Football Hall of Fame
Center for Civil and Human Rights
Center for Puppetry Arts
Krog Street Tunnel
Fernbank Museum of Natural History

On separate paper, provide the following information for your design:

- Topic (1 point)
- Reason for your choice (2 points)
- Paragraph on the significance of your choice to the city of Atlanta (5 points)
- Identify a color scheme of two to four signature colors that will be used predominantly throughout your design (3 points)
- Select four photos or images that you will use in your design (4 points)
- Sketch of how the exterior of your themed gondola will appear (5 points)
- Sketch of the interior of your themed gondola (5 points)

Grades 6-8

Lesson 2: Working on the Wheel

Teacher Instructions

In this lesson, your class will read a short story and solve a logic puzzle that matches three students to careers they would like to have someday, working with observation wheels like SkyView. Logic puzzles are a fun way to practice mathematical skills without using any numbers! Your students will be making deductions and establishing equalities like those in algebra: if A = B and B = C, then A = C.

To solve the puzzle, read each clue carefully. Use the answer grid to help you keep track of what you do and do not know. Because each student in the puzzle can only have one preferred career choice and one geographic location, you will need critical thinking skills and the process of elimination to solve the mystery.

When you can match a student to her career or location, put a checkmark in the box formed at the intersection of the person's row and the location's or career's column. If a clue tells you that something is not true or that a person does not like something, then place an X in the box for that person and that topic. For example, the first clue says that Ella does not want to live in the United States. Therefore, Atlanta is not going to be Ella's location. This first clue has been marked on the grid for you.

Keep reading the clues and marking an X on the grid for what is not true and a checkmark for what you know is true. When you finish the clues and still have not completed the logic puzzle, read through them again. Once you make some basic deductions, you will discover new relationships and come closer to solving the puzzle. Be diligent! If you get stuck, check your grid to see if any connections have revealed themselves.

Answer Key

Gracie – Atlanta – wheel operator
Ella – Singapore – web developer
Naomi – London – interior designer

Name Class Date

Working on the Wheel

Student Activity

In this lesson, you will read a short story and solve a logic puzzle that matches three students to careers they would like to have someday, working with observation wheels like SkyView. Logic puzzles are a fun way to practice mathematical skills without using any numbers! You will be making deductions and establishing equalities like those in algebra: if A = B and B = C, then A = C.

To solve the puzzle, read each clue carefully. Use the answer grid to help you keep track of what you do and do not know. Because each student in the puzzle can only have one preferred career choice and one geographic location, you will need critical thinking skills and the process of elimination to solve the mystery.

When you can match a student to her career or location, put a checkmark in the box formed at the intersection of the person's row and the location's or career's column. If a clue tells you that something is not true or that a person does not like something, then place an X in the box for that person and that topic. For example, the first clue says that Ella does not want to live in the United States. Therefore, Atlanta is not going to be Ella's location. This first clue has been marked on the grid for you.

Keep reading the clues and marking an X on the grid for what is not true and a checkmark for what you know is true. When you finish the clues and still have not completed the logic puzzle, read through them again. Once you make some basic deductions, you will discover new relationships and come closer to solving the puzzle. Be diligent! If you get stuck, check your grid to see if any connections have revealed themselves.

***Terms to Know**: deduction, elimination, grid, interior designer, logic*

The Story

On the bus ride home after their class field trip to SkyView, three friends discussed careers they would love to have some day that involves working with observation wheels. Their teacher overheard their conversation and could not wait to tell the other teachers back at school how much the students enjoyed the field trip. By the time they returned to school, the forgetful teacher could only remember parts of the friends' conversation. Help the teacher fill in the gaps by reading the clues and matching the students to their future careers and the cities around the world where they would love to live and work.

Students	**Locations**	**Careers**
Ella	London, UK	Wheel operator
Gracie	Atlanta, GA	Website developer
Naomi	Singapore	Interior designer

Name Class Date

The Clues

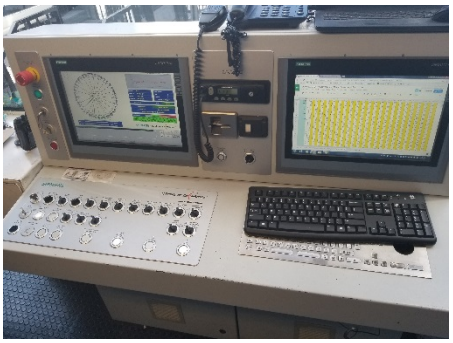
1. Ella hopes to see the world and wants a career that takes her out of the United States.
2. Naomi has always wanted to live in England.
3. The student who would like to live in Singapore also enjoys designing websites.
4. The student who wants to live in Atlanta is interested in the mechanical engineering that causes the wheel to rotate.

		Career			**Location**		
		Wheel operator	Interior designer	Web developer	Atlanta	Singapore	London
Student	Ella				x		
	Gracie						
	Naomi						
Location	Atlanta						
	Singapore						
	London						

Write the solution to the puzzle here.

Student	**Location**	**Career**

SkyView operates with four motors. One motor is selected as the master motor and the remaining three match the speed and torque feedback from the master. The wheel operator monitors the status of each motor via the operator control panel.



Grades 6-8

Lesson 3: Around the World

Teacher Instructions

SkyView is the largest, transportable, observation wheel in the United States. It arrived in Atlanta in 2013, divided into sections and packed into semi-trailer trucks. Piece by piece, the wheel was reconstructed at the site your class will visit on your field trip.

Because it is transportable, the wheel is held in place by weight instead of by anchors or pillars sunk into the Earth. Six water tanks that hold over 13,000 gallons of water each and 48 steel plates that weigh 2,500 pounds each keep SkyView secure to the ground. The total weight of the base is nearly 230,000 pounds! The water tanks and plates serve as ballast to help counteract the effects of extreme winds.

How does SkyView compare to some of the other wheels around the world? Do wheels of the same height have the same diameters? Do wheels with large diameters always have a corresponding height? Are observation wheels getting taller by the year? These are the questions your students will explore with the activities below.

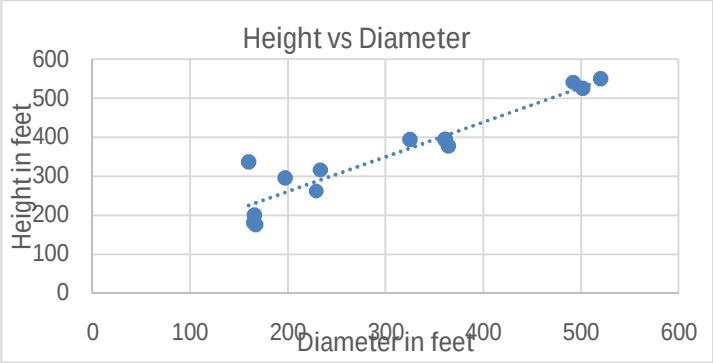
A chart in Part 1 lists 15 of the world's largest wheels that have opened in recent years. Your students will compare data sets to see which factor seems to have a greater effect on the heights of these giant observation wheels: their diameters or the years in which they were built. Students need graph paper and a calculator or access to a spreadsheet program on the computer.

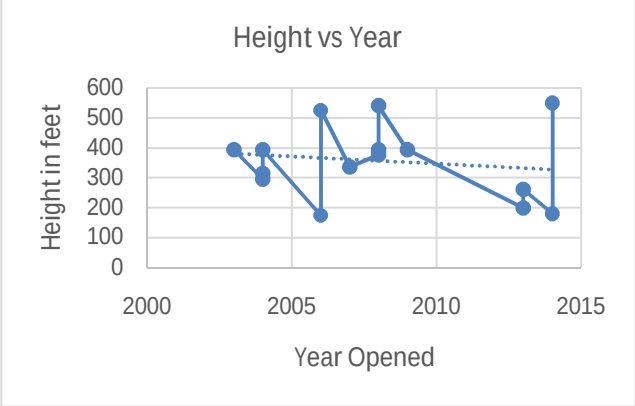
Observation wheels and Ferris wheels come in one shape, but many sizes. Where else will you find wheels with views from heights similar to that of SkyView? Your student will practice their map and globe skills with absolute location in Part 2. They will need a world map showing lines of latitude and longitude.

Answer Key

Part 1

1. Star of Puebla
2. 2, Asia and North America
3. China, Taiwan, U.S.A.
4. Range = 360 ft, mean = 306.87 ft, median = 325 ft, mode = 361 ft
5. Range = 375 ft, mean = 355.53 ft, median = 377 ft, mode = 394 ft
6. Range = 11 years, mean = 2008, median = 2008, mode = 2004 and 2008

7. 

8. Yes, it is a positive relationship because, overall, as the diameters of the wheels in the chart increase so do their heights.
9. One wheel, the Kaohsiung Eye in Taiwan, has a diameter of 160 feet but a height of 336 feet.
10. 

11. The line is practically flat, which indicates no relationship. If anything, it trends down which suggests a negative association.
12. (a.) false, (b.) true

Part 2

Latitude	Longitude	Hemispheres	City	Country
33° 44' N	84° 23' W	N, W	Atlanta	USA
35° 47' N	83° 33' W	N, W	Pigeon Forge	USA
35° 40' N	139° 50' E	N, E	Tokyo	Japan
13° 45' N	100° 30' E	N, E	Bangkok	Thailand
37° 55' N	58° 15' E	N, E	Ashgabat	Turkmenistan
53° 54' N	27° 33' E	N, E	Minsk	Belarus
41° 42' N	44° 49' E	N, E	Tbilisi	Georgia
14° 35' N	120° 59' E	N, E	Manila	Philippines
19° 2' N	98° 12' W	N, W	Puebla	Mexico
44° 25' N	12° 12' E	N, E	Ravenna	Italy

Name Class Date

Around the World

Student Activity

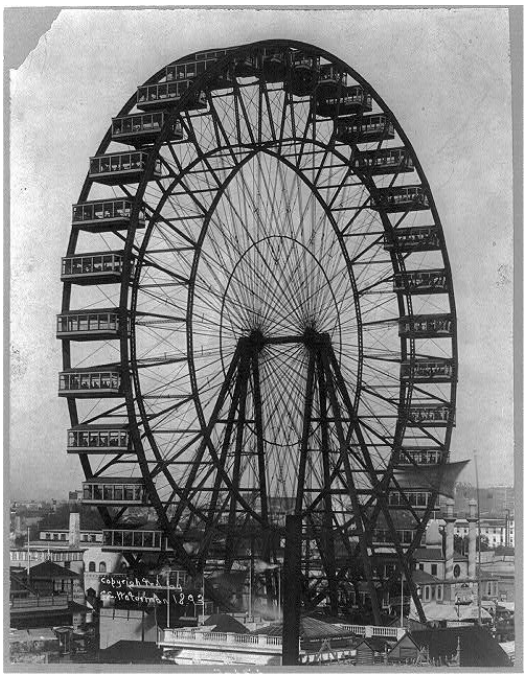
SkyView is the largest, transportable, observation wheel in the United States. It arrived in Atlanta in 2013, divided into sections and packed into semi-trailer trucks. Piece by piece, the wheel was reconstructed at the site you will visit on your class field trip.

Because it is transportable, the wheel is held in place by weight instead of by anchors or pillars sunk into the Earth. Six water tanks that hold over 13,000 gallons of water each and 48 steel plates that weigh 2,500 pounds each keep SkyView secured to the ground. The total weight of the base is nearly 230,000 pounds! The water tanks and plates serve as ballast to help counteract the effects of extreme winds.

How does SkyView compare to some of the other wheels around the world? Do wheels of the same height have the same diameters? Do wheels with large diameters always have a corresponding height? Are observation wheels getting taller by the year? These are the questions you will explore with the activities below.

A chart in Part 1 lists 15 of the world's largest wheels that have opened in recent years. You will compare data sets to see which factor seems to have a greater effect on the heights of these giant observation wheels: their diameters or the years in which they were built. You will need graph paper and a calculator or access to a spreadsheet program on the computer.

Observation wheels and Ferris wheels come in one shape, but many sizes. Where else will you find wheels with views from heights similar to that of SkyView? Practice your map and globe skills with absolute location in Part 2. You will need a world map showing lines of latitude and longitude.



The first giant observation wheel in the United States was the original Ferris wheel in 1893 (left). It rose 264 feet over Chicago—that's even higher than SkyView! (Library of Congress Prints and Photographs Division)

Name Class Date

***Terms to Know**: ballast, correlation, linear, median, mean, mode, range*

Part 1

Use this data to answer the questions that follow the chart.

Wheel	Country	Diameter in feet	Height in feet	Year opened
1. Zhengzhou Ferris Wheel	China	361	394	2003
2. Amuran	Japan	197	295	2004
3. Miramar Ferris Wheel	Taiwan	233	316	2004
4. Changsha Ferris Wheel	China	325	394	2004
5. Niagara Sky Wheel	Canada	167	175	2006
6. Star of Nanchang	China	502	525	2006
7. Kaohsiung Eye	Taiwan	160	336	2007
8. Tianjin Eye	China	361	394	2008
9. Star of Lake Tai	China	364	377	2008
10. Singapore Flyer	Singapore	492	541	2008
11. Suzhou Ferris Wheel	China	361	394	2009
12. SkyView	USA	166	200	2013
13. Star of Puebla	Mexico	229	262	2013
14. Capital Wheel	USA	165	180	2014
15. High Roller	USA	520	550	2014

1. Which wheel opened the same year that SkyView came to Atlanta?

2. How many continents are represented on the list? What are they?

3. List the countries that appear in the chart more than once.

4. What are the range, mean, median, and mode for the diameters of the wheels?

Name Class Date

5. What are the range, mean, median, and mode for the heights of the wheels?

6. What are the range, mean, median, and mode for the years in which the wheels opened? (round your answers to the nearest whole year)

7. On graph paper or on the computer, create a scatter plot for these 15 wheels with height on the y-axis and diameter on the x-axis. Draw a line of best fit to look for a correlation between the two variables.

8. Does your line of best fit suggest a linear association between the diameter of a wheel and its height? If so, is it positive or negative? Explain.

9. Identify an outlier on your height vs. diameter scatter plot.

10. On graph paper or on the computer, create a scatter plot for these 15 wheels with height on the y-axis and the opening year on the x-axis. Draw a line of best fit to look for a correlation between the two variables.

11. Does your line of best fit suggest a linear association between the diameter of a wheel and the year it opened? If so, is it positive or negative? Explain.

Name Class Date

12. True or false?

(a.) The evidence suggests that wheels that were built more recently tend to be larger than wheels built in years earlier. _____

(b.) There is a stronger correlation between a wheel's diameter and it height than there is with the height and the year it opened. _____

Part 2

Use the latitude and longitude to identify each location where you will find a wheel similar to Skyview in size. The first one is filled in for you.

Latitude	Longitude	Hemispheres	City	Country
33° 44' N	84° 23' W	Northern, western	Atlanta	USA
35° 47' N	83° 33' W			
35° 40' N	139° 50' E			
13° 45' N	100° 30' E			
37° 55' N	58° 15' E			
53° 54' N	27° 33' E			
41° 42' N	44° 49' E			
14° 35' N	120° 59' E			
19° 2' N	98° 12' W			
44° 25' N	12° 12' E			

Observations: Curriculum Standards

Grades 6-8

We know how important it is for you to justify field trips and document how instructional time is spent outside of your classroom. Both the activities in this Study Guide and the experiences your students have during their field trip to SkyView Atlanta are correlated to the Common Core State Standards for English Language Arts and Mathematics along with the C3 Framework for Social Studies State Standards, Next Generation Science Standards, and National Core Arts Standards.

The connections are arranged by content area and grade level. Following the national curricula, you will find the Georgia Standards of Excellence to assist with your planning needs.

NATIONAL CURRICULUM CORRELATIONS

Next Generation Science Standards: MS-PS2-2

C3 Framework for Social Studies State Standards: D2.Geo.2.6-8, D2.His.1.6-8, D2.His.3.6-8

Common Core State Standards for Mathematics

Grade 6: CCSS.Math.Content.6.RP.A.1, CCSS.Math.Content.6.RP.A.2, CCSS.Math.Content.6.RP.A.3, CCSS.Math.Content.6.NS.B.3, CCSS.Math.Content.6.EE.B.5, CCSS.Math.Content.6.EE.B.9, CCSS.Math.Content.6.SP.A.2, CCSS.Math.Content.6.SP.A.3, CCSS.Math.Content.6.SP.A.4, CCSS.Math.Content.6.SP.A.5

Grade 7: CCSS.Math.Content.7.RP.A.1, CCSS.Math.Content.7.RP.A.2, CCSS.Math.Content.7.RP.A.3, CCSS.Math.Content.7.NS.A.3, CCSS.Math.Content.7.G.B.4, CCSS.Math.Content.7.G.B.5, CCSS.Math.Content.7.SP.B.4

Grade 8: CCSS.Math.Content.8.SP.A.1, CCSS.Math.Content.8.SP.A.2, CCSS.Math.Content.8.SP.A.4

Standards of Mathematical Practice: 1, 2, 4, 6

Common Core State Standards for English Language Arts

Grade 6: CCSS.ELA-Literacy.RI.6.4, CCSS.ELA-Literacy.RI.6.7

Grade 7: CCSS.ELA-Literacy.RI.7.4, CCSS.ELA-Literacy.RI.7.7

Grade 8: CCSS.ELA-Literacy.RI.8.4, CCSS.ELA-Literacy.RI.8.7

Grades 6-8: CCSS.ELA-Literacy.RH.6-8.4, CCSS.ELA-Literacy.RH.6-8.7, CCSS.ELA-Literacy.RST.6-8.4, CCSS.ELA-Literacy.RST.6-8.4

National Core Arts Standards

Grade 6: VA:Cr1.2.6a, VA:Cn10.1.6a

Grade 7: VA:Cr1.2.7a, VA:Cn10.1.7a

Grade 8: VA:Cr1.2.8a

GEORGIA STANDARDS OF EXCELLENCE

Science
Grade 8: S8P3

Social Studies
Grade 6: SS6G7
Grade 7: SS7G9
Grade 8: SS8H7, SS8H12
Map and Globe Skills: 9, 11
Information Processing Skills: 1, 7, 9, 12

Mathematics
Grade 6: MGSE6.RP.2, MGSE6.RP.3, MGSE6.NS.3, MGSE6.EE.5, MGSE6.EE.9, MGSE6.SP.1, MGSE6.SP.2, MGSE6.SP.3, MGSE6.SP.4, MGSE6.SP.5
Grade 7: MGSE7.RP.1, MGSE7.RP.2, MGSE7.RP.3, MGSE7.NS.3, MGSE7.G.4, MGSE7.G.5, MGSE7.SP.4
Grade 8: MGSE8.SP.1, MGSE8.SP.2, MGSE8.SP.4
Standards of Mathematical Practice: 1, 2, 4, 6

English Language Arts
Grade 6: ELAGSE6RI4, ELAGSE6RI7
Grade 7: ELAGSE7RI4, ELAGSE7RI7
Grade 8: ELAGSE8RI4, ELAGSE8RI7
Grades 6-8: L6-8RH4, L6-8RST4, L6-8RH7, L6-8RST7

Visual Arts
Grade 6: VA6.CR.4b, VA6.CN.1c, VA6.CN.3c
Grade 7: VA7.CR.4b, VA7.CN.1c, VA7.CN.3c
Grade 8: VA8.CR.4b, VA8.CN.1c, VA8.CN.3c

Wheel of Time: Notable Dates

Below is a timeline of key moments in the development of the observation wheel from its beginning in the 19th century as the Ferris wheel to the modern day SkyView in Atlanta.

This information can be used in your classroom:

- To develop group study aids such as trivia contests and game or quiz shows
- As writing prompts and research project topics across the curriculum

---

1859 George Washington Gale Ferris, Jr., is born in Illinois.

1881 Ferris graduates from Rensselaer Polytechnic Institute in New York with a civil engineering degree.

1890 Architect Daniel Burnham challenges engineers to create a magnificent attraction for the 1893 Chicago's World's Fair to rival the Eiffel Tower from the World's Fair in Paris four years earlier.

1893 George Ferris builds his 264-foot tall wheel for the World's Fair in Chicago, IL.

1894 After the World's Fair ends, the wheel built by Ferris is relocated to another area of Chicago.

1895 The **Great Wheel** (308 ft) is built for an exhibition in London, England.

1896 George Ferris dies in Pennsylvania.

1900 Paris, France, gets its own wheel, the **Grande Roue**, for a world's fair. It is 328-feet tall.

1904 The Ferris wheel is taken apart in Chicago and rebuilt in St. Louis, MO, for the World's Fair.

1906 Ferris' original wheel is dismantled and destroyed for scrap metal in St. Louis.

1920 In Vienna, Austria, the **Wiener Riesenrad**, is built 212 feet high. It will become the longest-running Ferris wheel in the world.

1989 The era of giant wheels begins when the **Cosmo Clock 21** wheel is built 353 feet high in Japan.

2000 The first observation wheel to break 400 feet, the **London Eye** (443 ft), is built in England.

2006 The **Star of Nanchang**, in Japan, is the first wheel built over 500 feet high (525 ft).

2013 **SkyView Atlanta** opens in the Centennial Olympic Park District.

Name Class Date

Word Search: Around the World

The fourteen cities in this list have some of the tallest observation wheels in the world. How many have you ridden? We know one of them!

ATLANTA
CHICAGO
DALLAS
DUBAI
LONDON
MELBOURNE
NANCHANG
ORLANDO
OSAKA
PARIS
SINGAPORE
TIANJIN
TOKYO
YOKOHAMA

A	E	H	M	Q	T	O	W	Z	D	H	L	P	S	A
Y	T	L	T	X	A	S	E	I	M	Q	J	I	A	T
V	L	O	U	G	N	A	H	C	N	A	N	M	E	N
S	H	N	K	Y	C	K	G	K	O	G	N	E	I	A
P	D	D	R	Y	S	A	W	B	A	P	O	L	M	L
L	Z	O	T	F	O	K	Y	P	G	G	V	B	Q	T
I	W	N	N	I	J	L	O	L	A	T	Z	O	U	A
D	S	T	J	E	A	R	O	C	P	X	D	U	Y	B
D	O	P	F	A	E	N	I	T	H	C	H	R	B	F
A	U	Y	B	Z	D	H	J	O	R	L	A	N	D	O
L	K	B	X	V	C	Y	U	I	Q	M	L	E	F	J
L	G	U	A	I	E	A	W	S	N	O	K	G	C	N
A	C	R	V	I	R	N	J	F	B	X	U	R	O	K
S	I	R	A	P	G	C	Y	O	K	O	H	A	M	A

Name Class Date

Cryptogram: The First Ferris Wheel

All observation wheels— SkyView included - began as an idea dreamed up by George Ferris for the 1893 World's Columbian Exposition in Chicago. Ferris, an engineer, liked to tell the story of how the design came to him while dining at a restaurant in Chicago. Complete the quote below about his moment of inspiration. Use the key to fill in the missing letters. One vowel and consonant have been done for you.

"Before the dinner was over…

KEY

A	B	C	D	E	F	G	H	I	J	K	L	M
10	19	15	9	18	24	5	25	4	1	14	21	22

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
6	12	11	20	26	3	7	16	13	2	17	23	8

		H										H				O		
4		25	10	9		3	14	18	7	15	25	18	9		12	16	7	

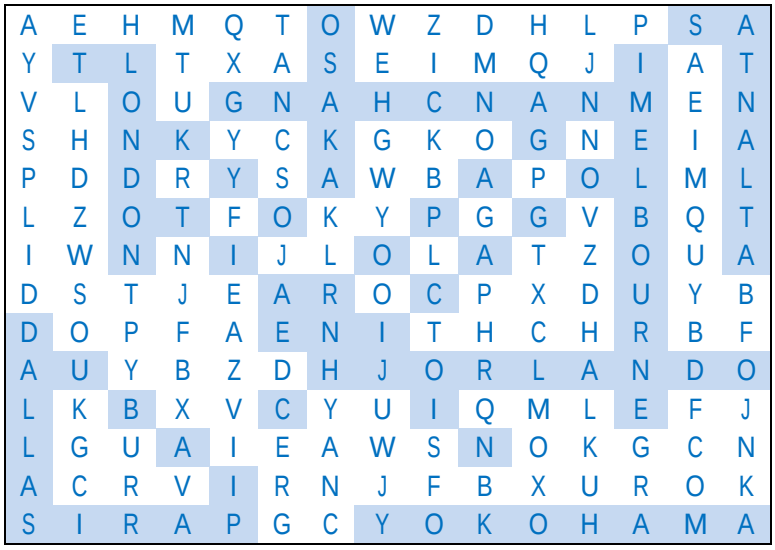
			O					H								
10	21	22	12	3	7		7	25	18		18	6	7	4	26	18

9	18	7	10	4	21	,	10	6	9		22	23		11	21	10	6

6	18	13	18	26		13	10	26	4	18	9		10	6		4	7	18	22

		O				H								O		
24	26	12	22		7	25	10	7		9	10	23		12	6	."

Word Search Answer Key



A	E	H	M	Q	T	O	W	Z	D	H	L	P	S	A
Y	T	L	T	X	A	S	E	I	M	Q	J	I	A	T
V	L	O	U	G	N	A	H	C	N	A	N	M	E	N
S	H	N	K	Y	C	K	G	K	O	G	N	E	I	A
P	D	D	R	Y	S	A	W	B	A	P	O	L	M	L
L	Z	O	T	F	O	K	Y	P	G	G	V	B	Q	T
I	W	N	N	I	J	L	O	L	A	T	Z	O	U	A
D	S	T	J	E	A	R	O	C	P	X	D	U	Y	B
D	O	P	F	A	E	N	I	T	H	C	H	R	B	F
A	U	Y	B	Z	D	H	J	O	R	L	A	N	D	O
L	K	B	X	V	C	Y	U	I	Q	M	L	E	F	J
L	G	U	A	I	E	A	W	S	N	O	K	G	C	N
A	C	R	V	I	R	N	J	F	B	X	U	R	O	K
S	I	R	A	P	G	C	Y	O	K	O	H	A	M	A

ATLANTA 15, 7, N
CHICAGO 6, 11, NE
DALLAS 1, 9, S
DUBAI 1, 9, SE
LONDON 3, 2, S
MELBOURNE 13, 3, S
NANCHANG 12, 3, W
ORLANDO 9, 10, E
OSAKA 7, 1, S
PARIS 5, 14, W
SINGAPORE 14, 1, SW
TIANJIN 4, 6, SE
TOKYO 2, 2, SE
YOKOHAMA 8, 14, E

Cryptogram Answer Key

...I had sketched out almost the entire detail, and my plan never varied an item from that day on.

The Man Behind the Wheel

Check this out – of your school library! Before or after your class trip to SkyView, use this list as a starting point to create your own "Whirlwind Book Collection." Learn more about the interesting life of George Washington Gale Ferris, Jr., the American engineer best known for inventing the Ferris wheel.

- Davis, Kathryn Gibbs. *Mr. Ferris and his Wheel*. HMH Books for Young Readers, 2014.
- Glatzer, Jenna. *George Ferris' Grand Idea: The Ferris Wheel (The Story Behind the Name)*. Picture Window Books, 2015.
- Kraft, Betsy Harvey. *The Fantastic Ferris Wheel: The Story of Inventor George Ferris*. Henry Holt and Co., 2015.
- Kulling, Monica. *Sky High: George Ferris's Big Wheel (Step into Reading).* Random House Books for Young Readers, 2016.
- Latta, Sara L. *Who Invented the Ferris Wheel? George Ferris (I Like Inventors!)*. Enslow Elementary, 2012.
- Lowell, Barbara. *George Ferris, What a Wheel! (Penguin Core Concepts)*. Grosset & Dunlap, 2014.
- Sneed, Dani. *Ferris Wheel!: George Ferris and His Amazing Invention (Genius at Work! Great Inventor Biographies).* Enslow Elementary, 2008.
- Sneed, Dani. *The Man Who Invented the Ferris Wheel: The Genius of George Ferris (Genius Inventors and Their Great Ideas)*. Enslow Elementary, 2013.