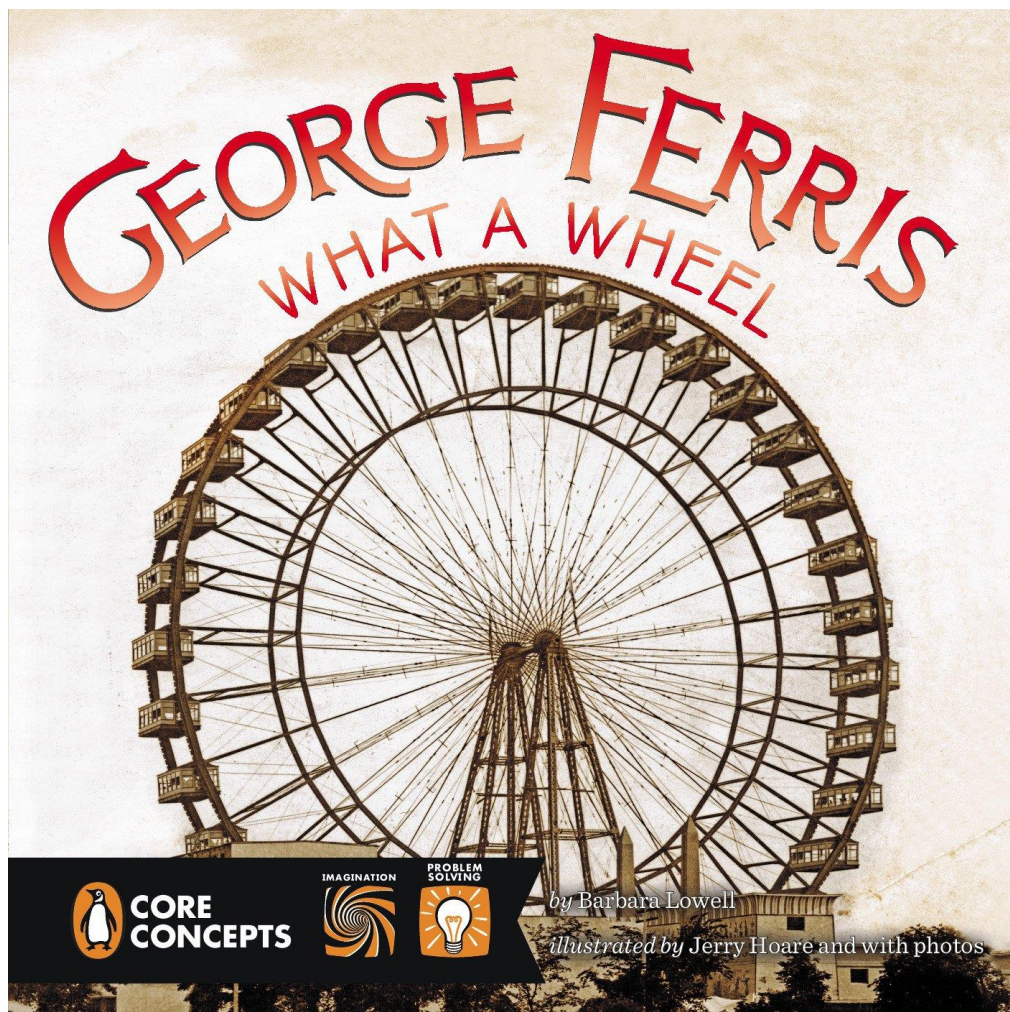


George Ferris

What a Wheel

A teacher's guide created by Marcie Colleen
based upon the picture book
written by Barbara Lowell and illustrated by Jerry Hoare and with photos



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Jerry achieved his B.A from Liverpool and his M.A. from Birmingham, since graduating he has worked as a freelance illustrator. Although varied in style, Jerry's work is all underlined by the same rustic charm. Mixing digital media with traditional aesthetics Jerry's work has been widely commissioned. His client list includes Coca Cola, Nescafe, The NHS, The Wellcome Foundation, Rangemoor, The BBC, Hodder and Stoughton, Bloomsbury, Penguin Books, The Radio Times, The Sunday Time and National Geographic. Visit him at <http://www.jerry-hoare.com/>.

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How to Use This Guide

This classroom guide for *George Ferris What a Wheel* is designed for students in first through fourth grade. It is assumed that teachers will adapt each activity to fit the needs and abilities of their own students.

It offers activities to help teachers integrate *George Ferris What a Wheel* into English language arts (ELA), mathematics, science, and social studies curricula.

All activities were created in conjunction with relevant content standards in ELA, math, science, social studies, art, and drama.

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English Language Arts

Reading Comprehension

Before reading *George Ferris What a Wheel*,

Look closely at the Front Cover ~

- Describe what you see.
- Have you ever ridden a Ferris wheel? Where? What was the experience like?
- Where do you think the Ferris wheel got its name? (hint: There is a big clue on the cover!)
- Do you think the Ferris wheel in the front cover illustration is one from a long time ago, or today? Why?
- How is this Ferris wheel different from the Ferris wheels you have seen?

The Back Cover~

- Read the blurb on the back cover:

Have you ever ridden a Ferris wheel? You can see for miles! But when the inventor of the Ferris wheel, George Ferris, first pitched the idea, everyone thought he was crazy. A 250-foot bicycle wheel that goes around and around and carries people in train cars? Can't be done, they said. But George proved them wrong.

- What information do you learn from this paragraph?
- What questions do you have after reading this paragraph?
- Does this paragraph make you want to read the book? Why or why not?

Now read or listen to the book.

Help students summarize in their own words what the book was about.

- According to the first page, what was George's profession?
- Describe George as an engineer. What kind of worker do you think he was?
- Describe George as a child. What kind of child do you think he was? What was he doing when he was just watching the waterwheel go around and around?
- How do you think these parts of George's personality led him to invent the Ferris wheel?
- List some of the attractions that would be part of the 1893 Chicago World's Fair.
- What inspired George's Ferris wheel?
- Imagine you were one of the fair officials in 1892. What would you think of George's wheel? Does it look safe? What are your concerns?
- Where does George get the money to start the Ferris Wheel Company and build his wheel?

- With new plans, George presents his design to the fair officials again. When they say yes, how many months do they give George to complete the wheel? Do you think he can do it?
- List the materials that George gathers for the wheel's construction.
- What are some of their struggles the workers face once they start digging? Besides the freezing temperatures, what solutions do they come up with for the struggles?
- Why do you think the workers dig so deep?
- The Ferris wheel was not ready in time for the fair's opening day on May 1, 1893. How much longer did it take?
- Why do you think the test run was still impressive even without the cars attached?
- Who took the first ride on the Ferris wheel once the cars were attached?
- Who were the passengers on the final test, once all of the cars were attached?

Let's talk about the people who made *George Ferris What a Wheel*.

- Who is the author?
- Who is the illustrator?
- What kind of work did each person do to make the book?

Now, let's look closely at the illustrations.

- Jerry Hoare uses a combination of illustration and old photographs to create *George Ferris What a Wheel*. How many photographs can you find?
- Why do you think the publisher chose to have some of the pages illustrated, while some use old photographs?

In the style of Jerry Hoare

- Choose an event from your childhood. It can be a trip, a family gathering, a holiday, birthday, or a school event. Find one or two photographs of this event. On a piece of paper or poster board, affix the photographs and then illustrate the surrounding space to tell more of the story.
- Display the finished pieces in the classroom.

Reading Nonfiction

While reading *George Ferris What a Wheel* aloud to the class, have students take notes in two columns:

- *Things We Learned*
- *Questions We Have*

Pause before each page turn to add notes to the columns. These columns can either be individual or hung on the board and worked on as a class.

Things We Learned (Facts)	Questions We Have	Answers We Found

- Once the story is read, discuss the *Questions We Have* column.
 - Were any of these questions answered as the story went along?
 - If so, ask students to find the answer within the text.
 - Record the answer next to the question in a third column labelled *Answers We Found*.

- For all remaining questions in the *Questions We Have* column, that have yet to be answered, students will need to take the steps to find answers, either through Internet or book research.
 - Discuss how to find answers to questions through research.
 - Assign students to specific questions to help them focus.
 - Record all answers in the *Answers We Found* column.

- After the answers have been shared with the class, engage in a discussion on research practices.
 - What was the most difficult about finding answers?
 - Was it easier to find answers on the Internet or in a book?
 - What tips would you give someone who is about to do research?

Extension: Design and illustrate posters representing each Fact, Question, and researched Answer based on *George Ferris What a Wheel* and display them within the classroom.

Writing Activities

A Ride on Ferris’s Wheel ~ creative story

Imagine that you are attending the 1893 Chicago World's Fair to ride the Ferris wheel. Write about your experience.

- Who are you? Where do you live? What is it about the Ferris wheel that makes you want to ride it?
- Where did you get the fifty cents to pay for your ride? Did you have to save up for it? Did you do chores? Was it a birthday gift?
- What was it like when you saw the wheel for the first time? What was it like waiting in a long line for your turn?
- Once aboard, how did you feel? Were you nervous? How far could you see? Who are some of the other people in your car?
- What was the best part? Would you ride the wheel again? If so, is there anything you would do differently?

Research about the 1893 Chicago World's Fair including photographs can aid students in placing themselves in the time period.

Have students share their stories of riding the wheel with the class.

George's Big Idea Persuasive Essay

Before George Ferris could build his wheel, he had to persuade the fair organizers that it was a good idea.

Ask your students if they know what "persuade" means? If not, can they make any guesses?

Discuss:

- What it means to persuade
- Times you might want to persuade someone (i.e., persuade your parents to let you stay up late, persuade your teacher to not give a test)

Writing to persuade tells the reader what you believe, gives the reader at least three reasons why you believe it, and has a good ending sentence. You want to try and convince the reader to agree with you.

Can you even imagine how much persuading George Ferris had to do in order to convince the fair organizers to let him build his wheel for the 1893 Chicago World's Fair?

Have students pretend that they are a supporter of George Ferris and write a persuasive essay to the fair organizers called "George's Big Idea" using the following TREE structure:

T = Topic sentences	The topic sentence tells the reader what you think or believe. Example: <i>I believe that George Ferris's wheel is safe and he should be given the opportunity to build it for the 1893 Chicago World's Fair.</i>
R = Reasons	The reasons tell the fair organizers why you believe what you believe. Write at least 2-4 sentences supporting 3 reasons. Use evidence directly from the text.
E = Ending	Wrap it up with a conclusive sentence.
E = Examine	Look closely. Do you have all of your parts?

Share your essays with the class. Which is the most persuasive? Why do you think so?

Speaking and Listening Extension: Create a TV commercial to encourage people to read *George Ferris What a Wheel*. Be sure to incorporate the TREE structure!

Language Activities

New Vocabulary: Brainstorming

What is brainstorming?

- To demonstrate, show the class a paper plate.
 - Then, give the class two minutes (use a timer) to list as many things as possible that the paper plate can be used for.
 - Record their ideas on the board.
 - Once the two minutes is up, review the list on the board.
 - Explain that what they were just engaged in was brainstorming.

Look up 'brainstorming' in the dictionary. (Depending on the level of your students, a student volunteer can do this or the teacher can.)

- Read the definition.
- Explain that a brainstorm is when you take all of the ideas in your head and let them out, kind of like how a cloud lets out all of the rain during a storm.

Explain the “rules of brainstorming.”

- Nothing is a bad idea. Do not criticize any ideas while brainstorming.
- Hitching is welcome. Listen to others’ ideas and let their ideas spark new ideas in you. This way, in group brainstorming, often ideas build upon each other.
- Be off-the-wall. Outrageous and humorous ideas are welcomed.

Now knowing what we know about brainstorming, let’s try some brainstorming activities.

- Categories Game. Have students sit in a circle and take turns brainstorming items in the announced category. For example, "animals." Go around the circle and have each child name an animal. They cannot repeat a response that another child gave. Go around the circle more than once if kids seem to have more ideas in that category. Other potential categories include fruits, vegetables, colors, items of a specific color, creatures that swim, musical instruments and things with wheels.
- Hypotheticals. Move brainstorming into the abstract by having students brainstorm answers to hypothetical questions. For example, ask them what a dog might be thinking while he sits at home or what might happen if people could fly. Record all of the answers so they can be read back to the kids when the brainstorming is finished. Rather than going around a circle and putting pressure on kids to think of something new, have students raise their hands to share answers. If a child is quiet, call on him/her early in a round before too many obvious answers have been said.
- Silly Answers. Teach students that they should share anything they can think of in a brainstorm, even if it does not seem like the best answer, by having them share the silliest answers they can think of to some questions. For example, brainstorm the silliest way to get from one end of the room to another. Turn it into a physical activity by having them demonstrate their silly methods, too. When students start running out of ideas, ask: "Who can think of something even sillier?" to prompt more responses.

After better understanding brainstorming, discuss:

- The value of brainstorming.
- Why brainstorming is so important to inventors and creators.
- How students could use brainstorming in their everyday life.

Math

How Big is 250 Feet?

George Ferris's wheel was 250 feet tall.

A large number, such as 250 feet, can be difficult for children to comprehend. Therefore, it is best to create something concrete that will help them better visualize and understand.

Have students practice using a measuring tape or ruler to determine the length of many items around the classroom (round to the nearest foot.)

Then, using simple division, find out how many of those items it takes to make 250 feet.

Use the chart below to record the data.

Item	250 feet	÷ Length of item in feet	How many of item to reach to the top of the Ferris wheel
You	250		
Your desk	250		
The door	250		

Math Without Numbers

Inventors and engineers use math skills every day, even when they don't use numbers. These skills are important to anyone who is thinking critically and solving problems.

Help your students practice with the following activities:

Classifying and grouping games: Mixing many kinds of blocks and ask students to classify them by size, color, or shape. Older children can classify and group themselves based on birthday months, height, color of clothing, etc.

Estimation: Using several sized containers and dried beans, students are to guess which containers will hold the most beans and which containers will hold the least beans. Have students put the containers in order according to their capacity. Once the class has agreed on the order, fill each container with beans, one at a time. Count how many beans are in each container. Were they right about the order?

Patterning: Build a simple pattern using M&Ms, buttons or pieces of paper. Start with an alternating pattern (called an AB pattern): one red candy, one green candy, one red, one green, and so forth. Be sure to repeat the pattern at least once. Next, students should continue the pattern by building a sequence that's exactly like the initial pattern. "How did you know to start with a red?" or "Why did you use a green here?" Some more difficult patterns to practice are: AAB, ABB, AABB, and ABC.

BONUS:

- How do you think classifying and grouping, estimating, and patterning assist inventors and engineers like George Ferris?
- How would you use these skills in your daily activities?

Science

The Scientific Method

The Scientific Method is an eight step series that engineers, scientists and inventors use to problem solve.

Step 1: Ask a Question

Step 2: Do Research

Step 3: Guess an Answer (also called a Hypothesis)

Step 4: Test Your Guess/Hypothesis

Step 5: Did it Work? Could it Be Better? Try Again

Step 6: Draw a Conclusion

Step 7: Write a Written Report of Your Results

Step 8: Retest

After introducing the eight steps to the class, lead them through a discussion.

- Describe how these eight steps help with problem solving.
- What do you think would happen if you skipped a step?
- Why do you think step 8 is important?
- Can you find evidence that George Ferris used many of these steps in *George Ferris What a Wheel?* How so? Use textual examples.
- Create an eight page Scientific Notebook for the Ferris wheel. Each page will include a separate step in the process. Imagine you are George Ferris and fill each page with your notes, drawings, and ideas about the wheel as you move through the process. Refer to *George Ferris What a Wheel* for ideas, as well as your own creative imagination.

Build a Bridge Challenge

Before George Ferris was the famous inventor of the Ferris wheel, he was an engineer who built bridges.

This challenge allows students to test out the Scientific Method for themselves as they problem solve a way to build a bridge that really works! Of course, a little imagination is going to go a long way here, too!

- Set up two tables or desks in the classroom that have a fairly large gap in between them (approximately 3-4 feet is ideal.)
- Explain to students that they will be working in groups of 2-3 to build a bridge to connect the two pieces of furniture.
- Provide the students with several craft items (rulers, paper, cardboard tubing, empty boxes, tape, glue, etc.) Check the recycling for other ideas of materials.
- Each group's bridge must:
 - Connect the two pieces of furniture.
 - Be a construction, not merely a long piece of cardboard laid across the gap.
 - Be strong enough to hold four Matchbox cars as they cross from one side to the other.
- The groups must create an eight page Scientific Notebook for their bridge and carefully document their use of the Scientific Method throughout the process of building their bridge.

Once all bridges have been built side by side connecting the two pieces of furniture, test them out one by one as a class. Did they work? Retest? If they didn't work, head back to the drawing board like a real inventor.

Often up awards to increase the competition.

- Strongest Bridge
- Most Attractive Bridge
- Most Materials Bridge
- Least Materials Bridge

Social Studies

1893—What a Year

A lot can happen in a year and it did in 1893.

Not only was 1893 the year of the Chicago World's Fair and the debut of George Ferris's iconic wheel, it also marked many other notable achievements. *The following, including a more detailed list can be found at: <http://en.wikipedia.org/wiki/1893>.*

1893 was a year of innovation:

- Thomas Edison finished construction of the first motion picture studio in West Orange, New Jersey.
- The diesel engine was patented by Rudolf Diesel.
- The first gasoline-powered motorcar in America was driven on public roads.

1893 was a year of political change:

- Gandhi committed his first act of civil disobedience in India.
- New Zealand became the first country to grant women the right to vote.
- Colorado women were granted the right to vote.

1893 was a year of firsts:

- The first recorded college basketball game occurred in Beaver Falls, Pennsylvania between the Geneva College Covenanters and the New Brighton YMCA.
- Carl Anton Larsen became the first man to ski in Antarctica.

1893 was a year of quirk and mystery:

- U.S. President Grover Cleveland was operated on in secret aboard a private yacht.
- The United States Supreme Court legally declared the tomato to be a vegetable.

Many more events from 1893 can be found online. Try the following links:

<http://www.historyorb.com/events/date/1893>

<http://www.biography.com/people/groups/born-1893>

<http://www.chicagohs.org/history/expo.html>

Assign groups of 2-4 students a notable event, person or innovation of 1893, to research and then present to the rest of the class in an original celebration of 1893.

Famous Ferris Wheels

They say imitation is the highest form of flattery. Well, George Ferris has certainly been imitated over and over again. In fact, his wheel is still popular today.

Assign a famous modern Ferris wheel for students to research in the library and on the Internet. A list of 7 are below, but do not feel limited to those on the list.

- London Eye
- Singapore Flyer

- Navy Pier, Chicago
- Riesenrad, Vienna
- Niagara Skywheel, Canada
- Pacific Park Wheel, Santa Monica
- Tianjin Eye, China

Possible sources for information:

- Nonfiction books
- Encyclopedias
- The Internet

Take notes and gather as much information as possible on the following 6 topics:

- History of when this wheel was built
- Information about where the wheel is located
- Size, dimension, statistics
- Similarities to George Ferris's wheel
- What makes this wheel different and more modern than Ferris's
- Other fun facts

Once the information is gathered, work to create either an illustrated poster or booklet of the findings.

BONUS: Design your own wheel for your hometown. Where would you place it? What would it look like?