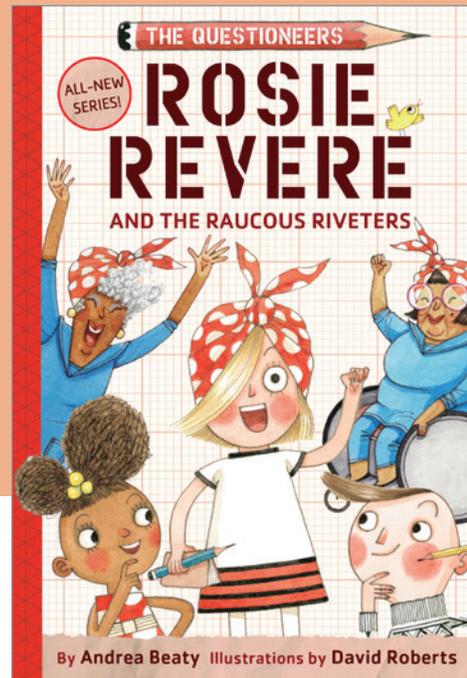


ROSIE REVERE AND THE RAUCOUS RIVETERS

by Andrea Beaty illustrated by David Roberts



ABOUT THE BOOK

Rosie Revere and the Raucous Riveters is filled with design challenges, thought-provoking questions, and marvelous mysteries that will intrigue young readers. Will Rosie be able to solve one of her greatest design challenges yet? Can she help Aunt Rose and the Raucous Riveters design a painting invention that will help save the day? Or will Rosie end up painting herself into a corner? And why is her mysterious neighbor, Mrs. Lu, always dressed in disguise?

Young readers will enjoy meeting the Raucous Riveters, the “smartest, sassiest, toughest bunch” of former–World War II airplane builders around. Of course, Iggy Peck and Ada Twist are always ready to share their scientific and architectural talents to the mix. Together, with her Aunt Rose, friends, and neighbors, Rosie will discover that taking care of one another is truly what family and home are all about.

About the Author and Illustrator

Andrea Beaty and David Roberts are the creators of *Ada Twist, Scientist*; *Iggy Peck, Architect*; and *Happy Birthday, Madame Chapeau*, among other award-winning children’s books. Out-of-this-world *Rosie Revere, Engineer* is currently orbiting Earth aboard the International Space Station as part of the Story Time from Space program, storytimefromspace.com. Beaty lives just outside of Chicago. Visit her online at andreabeaty.com and on Twitter: @AndreaBeaty. Roberts lives in London.

ACTIVITIES

ROSIE GOLDBERG: Kitchen Inventor

Compare Rosie’s kitchen-tested SnakeAway to the concept of a [Rube Goldberg machine](http://en.wikipedia.org/wiki/Rube_Goldberg_machine). Discuss its many parts and how its chain reaction works. Ask students, “What happens first? Next? Last?” Share [Audri’s Monster](https://www.youtube.com/watch?v=Udri's_Monster), a YouTube video that reflects how integral testing and retesting are to the design process. Instruct students to work in small groups to determine a simple task for a new invention. What simple problem will it solve? (Possible responses: fry an egg, brush your teeth, tie your shoe, etc.) Ask students to brainstorm a list of ordinary kitchen gadgets, objects, and food items—e.g., fork, toaster, frying pan, cup filled with orange juice. Challenge groups to select five to eight kitchen objects assembled to create a chain reaction that accomplishes the task. Instruct students to sketch, label, and present their “Rosie” Goldberg invention to peers.

MRS. LU'S CRATE: Simple Machine Inventions

In chapter three, readers meet the mysterious Mrs. Lu, whose backyard crate is filled with the most intriguing items for young inventors. Challenge your students to design an invention that can water Mrs. Lu's marigolds, daisies, pampas, and asters while she's away visiting her grandchildren. Inside Mrs. Lu's crate students will find the following recycled items:

- One old set of window blinds (pulley)
- One small backyard teeter-totter (lever)
- One rolling office chair (wheel and axle)
- One glass jar with a screw on lid (screw)
- One small metal playground slide (inclined plane)
- Five nails (wedge)

Discuss the concept of [simple machines](#). Ask students, "Which object is a pulley? A wedge? A screw?" etc." Ask, "Which objects can be used to build a watering invention for Mrs. Lu?" Assign students to small groups where they will brainstorm ideas, select an idea, sketch and label their design, and then present it to peers for feedback.

BLUE RIVER RIVETING IDEA: Working Together

Inventions are made up of a set of seemingly different parts that work together to solve a problem. Rosie's friends are a set of seemingly different individuals who become like her family. Each item in the six lists below represents a different friend. Students will assemble all 6 parts to design a mix and match invention in which all parts work together like a family.

Raucous Riveters	Bernice's Archeology Shop	Marian's Opera Bag	Ada's Satchel	Iggy's Toolbelt	June's Art Studio
bagpipe dance shoes organ accordion	shovel pail magnifying glass	opera glasses conductor's wand	test tubes goggles Bunsen burner	hammer nails ruler	paint brushes canvas

Working in small groups, students will:

- a. select one item from each group for a total of six items.
- b. brainstorm how to assemble their items to design an invention.
- c. illustrate individual items on cardstock, cut them out, and assemble them as a collage-style prototype.
- d. share and explain their invention to peers. Why is each part important to your invention? How do the parts work together?

TIP: use brass fasteners to create movable parts.

REINVENTING THE WHEEL: Updating Old Technologies

Rosie is tasked with designing an invention to help June paint a mural without electricity. Note how electricity was first introduced by Thomas Edison back in 1879. Prior to this time, inventors resorted to manpower, oil, steam, and coal to power their inventions. Discuss how old technologies have been improved by renewable energies, such as solar power, wind power, and hydropower.

Task from 1800s	Same Task Today
Pumping water from wells by hand	Windmills using wind power to pump water
Chopping wood and burning coal to heat homes	Solar panels installed on rooftops to heat homes

Challenge students to think of a current household invention and how it can be improved using new technologies. Ask, "What is the problem with this invention?" (Possible responses: it pollutes, it is too large, it is inefficient, etc.) Then ask "how can it be improved?" Students create a blueprint for their new invention on graph paper and share with their peers for feedback.

REPURPOSE ON PURPOSE: Designing A New Purpose

In chapter eight, Rosie considers repurposing the pump from her SnakeAway invention to pump paint in her Paintapalooza. Challenge students to brainstorm other possible purposes for the pump. Hints: a toothpaste squirter, a suntan lotion shooter. Visit the [online artwork of Victor Nunez](#) who sees everyday objects in new ways. Discuss how artists and inventors are alike (Possible response: Both see the world differently and find inspiration in their surroundings). Instruct students to choose a classroom object and repurpose it in the style of Victor Nunez, using the actual object glued to the paper of their art.

FABULOUS FLOP: Questions that Lead to Answers

In chapter nine, Rosie considers how to fix the loose tube in her Paintapalooza by asking herself questions. Teach students to ask questions that lead to creative solutions.

What went wrong?

What went right?

Why did it happen? (Possible responses: The air pressure was too great; the hose was not tightly connected; a valve was needed.)

Challenge students to work in small groups brainstorming as many ways as possible to fix the loose tube in ten minutes. Their solutions can range from the serious to the sublime. The group with the most solutions wins!

CALM, COOL, & COLLECTED: Inventing a Frame of Mind

In chapter twelve, Rosie's friends remind her that keeping calm is the best way to carry on when you're inventing. Discuss how Rosie's friends chillax, e.g., the Raucous Riveters dance and play musical instruments, while Marian listens to opera. Challenge students to choreograph a new stress-reducing dance for inventors. What are the best dance moves to release stress? What types of music are most relaxing? Students will work on this challenge in small groups and then teach their inventor's dance to the class. The most relaxing dance routine wins!

InVALVEuable: Musical Inventor

Aunt Rosie and the Blue River Riveters play musical instruments that utilize valves to allow air to flow through the pipes without letting it back in again. Challenge students to add a valve to an existing musical instrument. For example, a violin with a valve becomes a "valvolin." Instruct students to illustrate their instrumental inventions. Ask them to share their invention with the class, explaining how the addition of the valve changed the instrument and how it's played.

HELPING HANDS: Inventions that Help Others

June tells Rosie that she "helped someone she didn't even know." Inventors try to make the world a better place by solving one problem at a time. Display a chart with a list of problems that could help someone in your community. Example: Help an elderly neighbor walk his or her dog. Help someone in a wheelchair reach for high objects in a supermarket. Students will use [Tinkercad](#) to design an invention to solve a selected problem. Designs can be 3-D printed as prototypes to share in a classroom "Helping Hand Gallery."

MEET THE REAL ROSIE THE RIVETER: "Can-Do!" Inventors

Discuss Rosie the Riveter as a symbol of the historic women who worked in factories, shipyards, and the aircraft industry during World War II. They took over jobs traditionally held by men, while their husbands and sons were at war. Ask students how these women paved the way for today's engineers. Show students the famous "You Can Do it" poster, which has become a symbol of these women's determined spirit. Rosie Revere has a can-do attitude, just like the Rosie in the poster. Inventors need a positive attitude in order to overcome obstacles. Have students design a digital "Inventors Can Do It!" poster using the [Glogster app](#). Students can add digital pictures, custom recordings, music, YouTube videos, and decals to create an interactive multimedia presentation.

ACTIVITY EXTENSIONS

HI-TECH INVENTORS: Design Technologies for Budding Designers

Design a robotic Paintapalooza. Use code.org to paint a program to move the paintbrush forward and backward, up and down. Bonus points if you can program it to change colors.

Use Tinkercad to create a 3-D design for your own version of the Paintapalooza. What geometric shapes will you need to design your new invention? Print out a prototype using a 3-D printer.

DISCUSSION QUESTIONS

Use these questions for whole-class discussions, reading check-ins, or as writing prompts with students.

1. In chapter one, Rosie tests her new SnakeAway invention in her kitchen. After the explosion, Rosie writes herself a quick note: “Testing in Kitchen = Bad idea!” Explain what’s wrong with this setting and suggest a better setting for testing. Explain why this new setting is ideal.
2. In chapter two, Rosie uses alliteration to name each of the five prototypes she’s created for Uncle Fred’s SnakeAway. Explain why she gives each failed attempt a positive name. Use alliteration and the next letters in the alphabet to come up with a name for failed attempts six, seven, and eight.
3. In chapter three, why does Rosie believe that Mrs. Lu does not like her? Do you agree? Explain.
4. In chapter four, Rosie meets the Blue River Riveters. The Riveters are musicians and dancers. How does music help inventors create?
5. In chapter six, Rosie is assigned a unique design challenge to create an invention that will help June paint a mural with her hands in a cast. The invention may not use electricity. Add one more design limitation that will make this challenge even harder for Rosie, e.g., painting blindfolded. Now brainstorm as many solutions as you can. Go!
6. In chapter nine, Rosie tests her prototype and asks herself what has gone right with the test and what has gone wrong? Is the answer to one question more important than the other? Explain your thinking.
7. In chapter eleven, Rosie has to stop thinking about the “what-ifs.” Aunt Rose tells her to “stop and think differently.” Why is this important advice for an inventor? Share a time that your own what-ifs might have prevented you from succeeding in a project, task, or challenge.
8. In chapter twelve, Rosie needs a break, so she will think calmly and clearly about her invention. Advise Rosie on the best way to relax when you’re feeling stressed.
9. In chapter thirteen, Rosie learns how the bagpipes, accordion, and organ all use a valve that holds air until a note is played. How does that help her come up with an idea for her painting invention?
10. In chapter fourteen, Rosie finds out that the theme for the Art-a-Go-Go competition is “home.” What does the word “home” mean to you? Sketch a mural design to express your feelings.
11. In chapter seventeen, Rosie runs over to Mrs. Lu’s house for help even though she’s a little afraid of her. What characteristics does Rosie display? (Possible responses: determination, courage, persistence, etc.)
12. In chapter eighteen, Mrs. Lu reveals that she left the bucket of tubes and tape for Rosie. Why is Rosie surprised? Why do you think Mrs. Lu did this?
13. In chapter twenty, Rosie and all of the Riveters help paint the mural. How does June feel about having others paint the mural? Explain why she feels that way.
14. How are Rosie, Iggy, Ada, and the Raucous Riveters like one big family? Is there someone special in your life who is not related to you, but feels like family? Explain.
15. Rosie helped someone she didn’t even know. Describe examples of other inventions that help people every day. (Possible responses: wheelchairs, eyeglasses, shopping carts, copy machines, microwave ovens, etc.)
16. What did the Riveters mean when they told Rosie that she was now a part of the family and their home was her home, too? How do you define “family” and “home”?

NEXT GENERATION SCIENCE STANDARDS

Here are Next Generation Science Standards Topics from grades kindergarten-middle school that can be met by extending *Rosie Revere and the Raucous Riveters* with the above discussion questions/activities.

K-2-ETS1-1 Engineering Design

Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2 Engineering Design

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2-ETS1-3 Engineering Design

Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

3-5-ETS1-1 Engineering Design

Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2 Engineering Design

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3 Engineering Design

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

MS-ETS1-1 Engineering Design

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2 Engineering Design

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3 Engineering Design

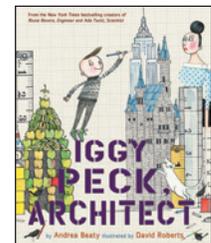
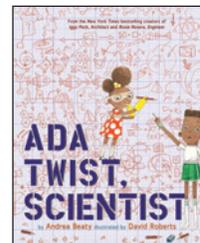
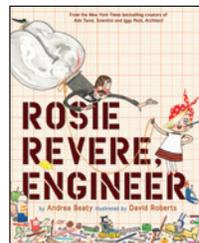
Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4 Engineering Design

Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

ALSO AVAILABLE

Picture Books



Activity Books

