CLASSROOM GUIDE

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Books to Inspire Learning

Gutsy Girls Go for Science: Engineers: With Stem Projects for Kids

Nomad Press offers concise classroom guides to help educators explore content-related topics with students and encourage them to develop ideas in meaningful ways. Includes Essential Questions and Common Core Connections.
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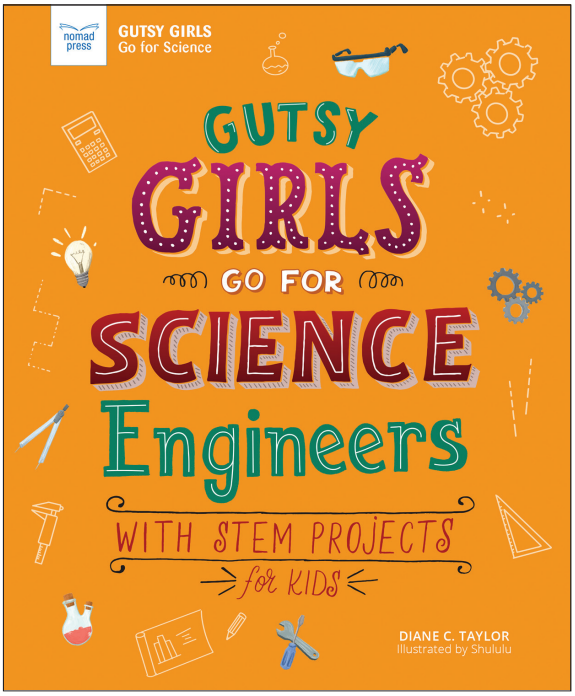


Age: 8–11
Grade: 3–5
Softcover: 9781619307858, $14.95
Hardcover: 9781619307827, $9.99
eBook: all formats available, $12.99
Specs: 8 x 10, 128 pages, color interior
Focus: Engineering and Technology
GRL: R

Have you crossed over a bridge today? Have you opened up a carton of milk? These things were made possible through engineering!

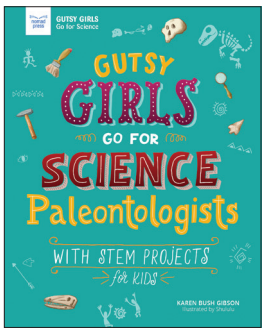
In ***Gutsy Girls Go for Science: Engineers with STEM Projects for Kids***, readers ages 8 to 11 meet five female engineers who revolutionized the role of women in engineering, including Ellen Swallow Richards, Emily Warren Roebling, Kate Gleason, Lillian Moller Gilbreth, and Mary Jackson. Short sidebars highlight the accomplishments of contemporary female engineers and reveal the ways that women are finding success in engineering today, pointing the way for young people to make career connections.

Using a fun narrative style, engaging illustrations combined with photography, fascinating facts, essential questions, links to online resources, and hands-on projects, this book deepens readers' creative and critical thinking skills.

Learn more about *Engineers* at nomadpress.net/nomadpress-books/gutsy-girls-go-for-science-engineers/

Inspires Interest in STEM

MORE GUTSY GIRLS GO FOR SCIENCE BOOKS FROM NOMAD PRESS!



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HC: 9781619307780, $19.95

PALEONTOLOGISTS
PB: 9781619307933, $14.95
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PROGRAMMERS
PB: 9781619307896, $14.95
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ESSENTIAL QUESTIONS TO ASK

KEY VOCABULARY

actuator, automata, capacitor effector, function, hydraulic, loop, pseudocode, switch

BEFORE READING

1 Establish Background Knowledge

a What does an engineer do? How is this similar to and different from an architect or a computer programmer?

b Why might people find ancient civilizations fascinating to learn about?

c Why does it matter that all people receive recognition for the work they do and the things they accomplish?

2 Skill Introduction

a What do you do when you come to a word or phrase you do not know?

b How do photographs and videos help someone learn about a topic?

CCC: **CCSS.ELA-Literacy.L.4.4** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

DURING READING

1 Check for Understanding

a Why is it important to learn about the lives of other people?

b How do we learn about early people who lived millions of years ago?

c How do scientists solve problems and answer questions?

d How do activities help you learn about the lives of important people?

e How is hands-on learning through activities different from learning through listening or reading the text?

CCC: **CCSS.ELA-Literacy.L.4.4c** Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.

PS

Watch a short home video of the Leakey camp at Olduvai Gorge, one of the dig sites the Leakeys worked on. What might it have been like to work there?
https://www.youtube.com/watch?v=LCeJl6guahA&feature=youtu.

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ESSENTIAL QUESTIONS TO ASK

AFTER READING

1 Summary and Expansion

a Why is it important that people of all genders do scientific work?

b What were some of the challenges faced by women doing work that had previously been done mostly by men? How did they overcome these challenges?

c Why is it important to be careful and write down observations when doing science experiments, even if you are working in a field or at a dig site?

d How did the glossary help you understand the book?

2 Critical Thinking

a Why is it important to know about people and animals that lived millions of years ago?

b What role does imagination play when someone is working in science?

c Why is it important to use all our senses when making scientific observations?

CCC: **CCSS.ELA-Literacy.RF.4.4c** Use context to confirm or self-correct word recognition and understanding, rereading as necessary.
CCC: **CCSS.ELA-Literacy.RI.4.3** Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
CCC: **CCSS.ELA-Literacy.SL.4.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

COMMON CORE CONNECTIONS

Grade: 4 Writing CCSS.ELA-Literacy.W.4.2,2b,2c,2d,2e,4,7,8,9,10

Grade: 4 Speaking & Listening CCSS.ELA-Literacy.SL.4.1,1c,1d,1d,3,4,5,6

Grade: 4 Reading: Informational Text CCSS.ELA-Literacy.RI.4.1,2,3,4,5,6,7,8,9,10

Grade: 4 Reading: Foundation Skills CCSS.ELA-Literacy.RF.4.3,3a,4,4a,4c

Grade: 4 Language CCSS.ELA-Literacy.L.4.3,4,4a,4b,4c,5,5c,6

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COMMON CORE CONNECTIONS

Grade: 4 Language
CCSS.ELA-Literacy.L.4.3,4,4a,4b,4c,5,5c,6

3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.
4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.
4a Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase.
4b Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., telegraph, photograph, autograph).
4c Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.
5 Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
5c Demonstrate understanding of words by relating them to their opposites (antonyms) and to words with similar but not identical meanings (synonyms).
6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).

Grade: 4 Reading: Informational Text
CCSS.ELA-Literacy.RI.4.1,2,3,4,5,6,7,8,9,10

1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.
3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
5 Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.
6 Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided.
7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
8 Explain how an author uses reasons and evidence to support particular points in a text.
9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.
10 By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.

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COMMON CORE CONNECTIONS

Grade: 4 Reading: Foundation Skills
CCSS.ELA-Literacy.RF.4.3,3a,4,4a,4c

3 Know and apply grade-level phonics and word analysis skills in decoding words.
3a Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.
4 Read with sufficient accuracy and fluency to support comprehension.
4a Read grade-level text with purpose and understanding.
4c Use context to confirm or self-correct word recognition and understanding, rereading as necessary.

Grade: 4 Speaking & Listening
CCSS.ELA-Literacy.SL.4.1,1c,1d,1d,3,4,5,6

1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
1c Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
1d Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
1d Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
3 Identify the reasons and evidence a speaker provides to support particular points.
4 Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.
6 Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation. (See grade 4 Language standards 1 here for specific expectations.)

Grade: 4 Writing
CCSS.ELA-Literacy.W.4.2,2b,2c,2d,2e,4,7,8,9,10

2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
2b Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
2c Link ideas within categories of information using words and phrases (e.g., another, for example, also, because).
2d Use precise language and domain-specific vocabulary to inform about or explain the topic.
2e Provide a concluding statement or section related to the information or explanation presented.
4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.
8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.
9 Draw evidence from literary or informational texts to support analysis, reflection, and research.
10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of disciplinespecific tasks, purposes, and audiences.

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ACTIVITY!

Project from *Gutsy Girls Go for Science: Engineers: With Stem Projects for Kids*

Kite Aerodynamics

THE FORCES THAT ACT ON AN AIRPLANE—WEIGHT, LIFT, DRAG, AND THRUST—ARE THE VERY SAME FORCES THAT ACT ON A KITE. MAKE A KITE AND SEE FOR YOURSELF!

1. To make the frame, form the two sticks into a lowercase T. Hold the sticks together with a dab of glue, and wrap string around the spot where the two sticks meet.

2. Glue the end of the spool of string to the bottom of the frame, then wrap the string tightly around the end of the stick. Pull the string to the next point of the frame, and do the same thing again. Continue until you have created a diamond-shaped outline of your kite. Cut the string off of the spool.

3. To make the sail, cut off the handles and the sides of the plastic bag to create a flat sheet. On the sheet, trace a one-inch margin around the frame. Cut along the line.

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YOUR FIELD KIT CHECKLIST

- ✓ **TWO RECYCLED PLASTIC SHOPPING BAGS**
- ✓ **2 THIN, LIGHTWEIGHT STICKS ABOUT THE SAME SIZE AS THE PLASTIC BAGS, ONE 4 TO 6 INCHES SHORTER THAN THE OTHER**
- ✓ **A SPOOL OF STRING**
- ✓ **RIBBON**

4 Cut a one-inch straight cut at each corner of the plastic. Fold the one-inch margin of plastic around each section of the frame. Tape along the entire edge of each section.

5 Cut a piece of string 4 to 6 inches longer than the longest stick. Tie the string tightly to both ends of the stick, outside the kite sail. Do the same to the other stick. Tape or glue all the knots firmly in place.

6 Tie the spool of string to the point where the vertical and horizontal strings meet.

7 Use a second plastic bag and cut a strip that is up to 3 feet long. Tape it to the bottom point of your kite. Cut three or more 6-inch pieces of ribbon and tie them to the kite tail.

Try this!

Find a safe, open area outside to fly your kite. Can you get it airborne? What might you need to adjust to make your kite fly better?

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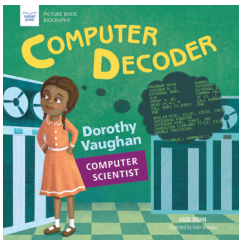
More Engineering Books!



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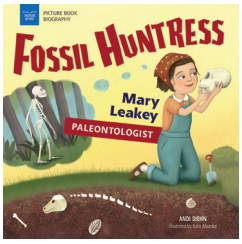

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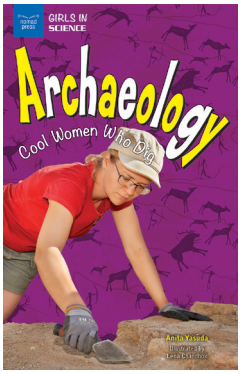

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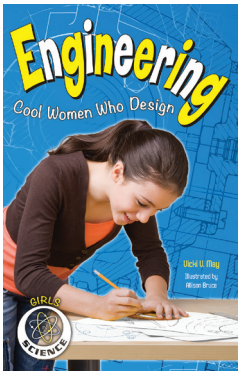

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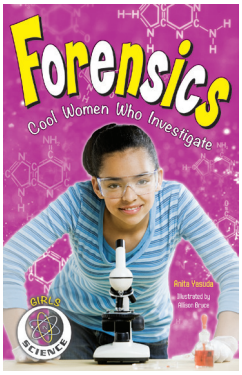

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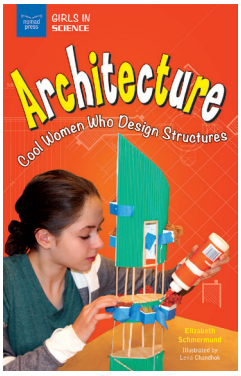

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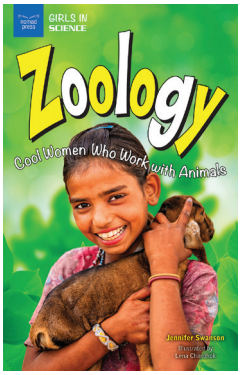

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