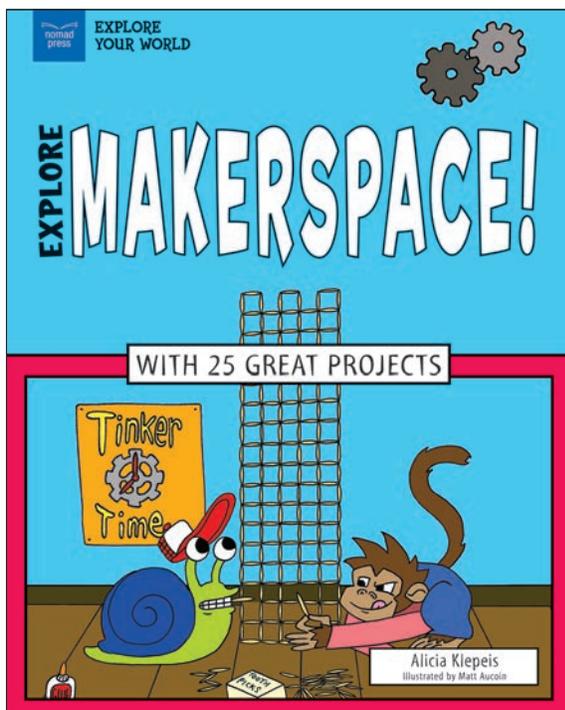


CLASSROOM GUIDE

Including Essential Questions and Common Core Connections

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

Download free classroom guides for other Nomad Press books at our website, nomadpress.net!



Age: 7–10

Grade: 3–4

Softcover: 9781619305663, \$14.95

Hardcover: 9781619305625, \$19.95

eBook: all formats available, \$9.99

Specs: 8 x 10, 96 pages, color interior

Focus: Engineering & Technology

GRL: S

Explore Makerspace! With 25 Great Projects

Through tinkering, trial-and-error, and the engineering design process, everyone can discover new products and processes in a makerspace! In *Explore Makerspace! With 25 Great Projects*, kids ages 7 through 10 explore what it means to be an engineer while doing fun projects that help them discover the physical science that makes our world work.

Start making with these **hands-on STEM activities**:

- Build a bridge!
- Design your own furniture — out of paper!
- Create a board game!
- Make a boat that really floats!

Learn more about the book *Explore Makerspace!* at nomadpress.net/books/makerspace



/NomadPress



/NomadPress


nomad press
www.nomadpress.net



/NomadPressVT



@NomadPressVT

ESSENTIAL QUESTIONS TO ASK

KEY VOCABULARY

abacus, amplifier, bouyancy, collaborate, decipher, elaborate, geometric, obstacle, prototype

BEFORE READING

1 Establish Background Knowledge

- What do you already know about engineering?
- What kinds of questions can engineering design answer?
- How do you use engineering in your life?

2 Skill Introduction

- What do you do when you come to a word or phrase you do not know?
- What are text features? How do they support understanding of the content?
- How can we work together to solve problems?

CCC: CCSS.ELA-Literacy.L.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

- How does someone's environment influence what they design?
- Why is it important for engineers and designers to consider the person who will be using the product?
- Why are wheels considered a kind of technology? What do wheels have in common with computers?
- Do you think you learn differently when you do a project instead of reading about a project?
- How does sound travel through air? Why is it useful to know how sound travels?

CCC: CCSS.ELA-Literacy.RI.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.



There is a lot of advice on the Internet about creating makerspaces in your home! **Check out this article for some great ideas.**
[instructables.com/id/Create-a-Maker-Space-for-Kids](https://www.instructables.com/id/Create-a-Maker-Space-for-Kids)



/NomadPress



/NomadPress



/NomadPressVT



@NomadPressVT

ESSENTIAL QUESTIONS TO ASK

AFTER READING

1 Summary and Expansion

- a What new information did you learn? How can you apply this information to your life?
- b What is tinkering? How have people used tinkering to make discoveries and invent new products and ways of doing things?
- c How might games help you learn? Can they help you do better at other things?
- d How does this book compare to others you have read on the same topic?
- e How does the data support the author's perspective? Is the author convincing?
- f Do readers have the chance to make their own deductions?
- g How do hands-on activities help you learn?

CCC: CCSS.ELA-Literacy.W.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.

CCC: CCSS.ELA-Literacy.SL.1d Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

CCC: CCSS.ELA-Literacy.W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

COMMON CORE CONNECTIONS

Grade: 4 Language CCSS.ELA-Literacy.L.4.3,4,4a,4b,4c,5,5c,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 Speaking & Listening CCSS.ELA-Literacy.SL.4.1,1a,1c,1d,2,4,5

Grade: 4 Writing CCSS.ELA-Literacy.W.4.4,7,8,9,9b,10



/NomadPress



/NomadPress



/NomadPressVT



@NomadPressVT

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: 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 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.



/NomadPress



/NomadPress



/NomadPressVT



@NomadPressVT

COMMON CORE CONNECTIONS

- 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.

Grade: 4 Speaking & Listening

CCSS.ELA-Literacy.SL.4.1,1a,1c,1d,2,4,5

- 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.
- 1a Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
- 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.
- 2 Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- 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.

Grade: 4 Writing

CCSS.ELA-Literacy.W.4.4,7,8,9,9b,10

- 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.
- 9b Apply grade 4 Reading standards to informational texts (e.g., "Explain how an author uses reasons and evidence to support particular points in a text").
- 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 discipline-specific tasks, purposes, and audiences.



/NomadPress



/NomadPress



/NomadPressVT



@NomadPressVT

PROJECT!**GROSS GOOP!**

In this activity, you will combine water, glue, and borax and observe what happens to their consistency as they are mixed.

Caution: Have an adult help with the borax. Wear eye protection when handling.

1 In a bowl, mix $\frac{1}{2}$ cup water with 1 ounce of glue (about a quarter of an average school glue bottle.) If you want colored goop, add a few drops of food coloring to the water and glue mixture. Stir the mixture. Lift a little of this solution out of the bowl with your stirrer. What happens?

2 Add $\frac{1}{4}$ cup borax to the glue and water mixture. Stir this slowly. Lift a little of this mixture out of the bowl and see how its consistency has changed.

3 Stir the mixture as much as you can with the stirrer. Then use your hands to knead the mixture until it becomes less sticky. This will be messy, but kneading helps the mixture bond completely. If there's any water left in the bowl, just pour it out. Now play with your goop!

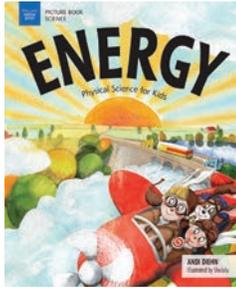
4 Store your goop in a plastic bag in the refrigerator so it doesn't grow mold. Make sure to wash your hands after handling the goop.

THINK ABOUT IT: How did the consistency of the goop change over the course of this activity?

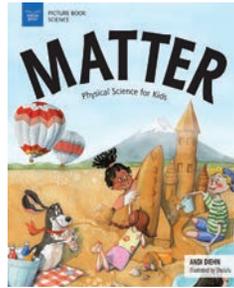
SUPPLIES

- * eye protection
- * medium-sized bowl
- * water
- * white glue
- * stirrer
- * food coloring (optional)
- * borax
- * Ziploc bag

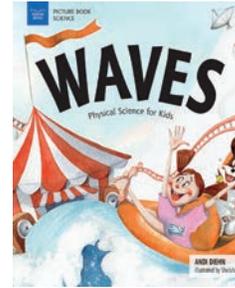
More Physical Science books from Nomad Press:



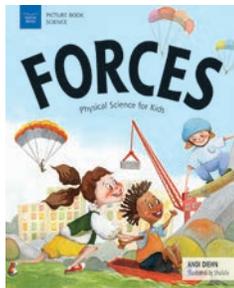
Author: Andi Diehn



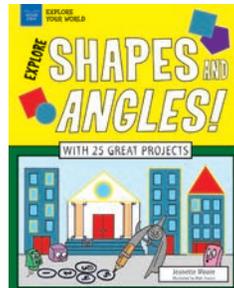
Author: Andi Diehn



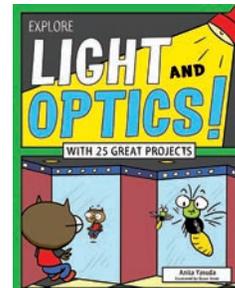
Author: Andi Diehn



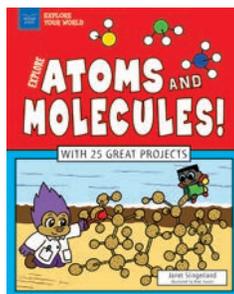
Author: Andi Diehn



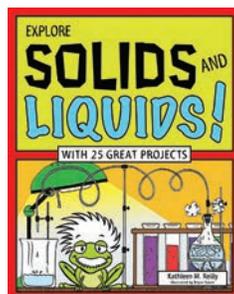
Author: Jeanette Moore



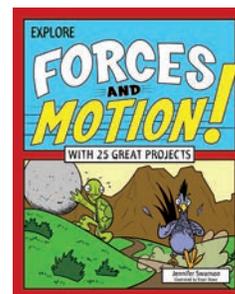
Author: Anita Yasuda



Author: Janet Slingerland



Author: Kathleen M. Reilly



Author: Jennifer Swanson

Check them out at nomadpress.net



/NomadPress



/NomadPress



/NomadPressVT



@NomadPressVT