CLASSROOM GUIDE

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Books to Inspire Learning

The Science of Weather and Climate: Rain, Sleet, and the Rising Tide

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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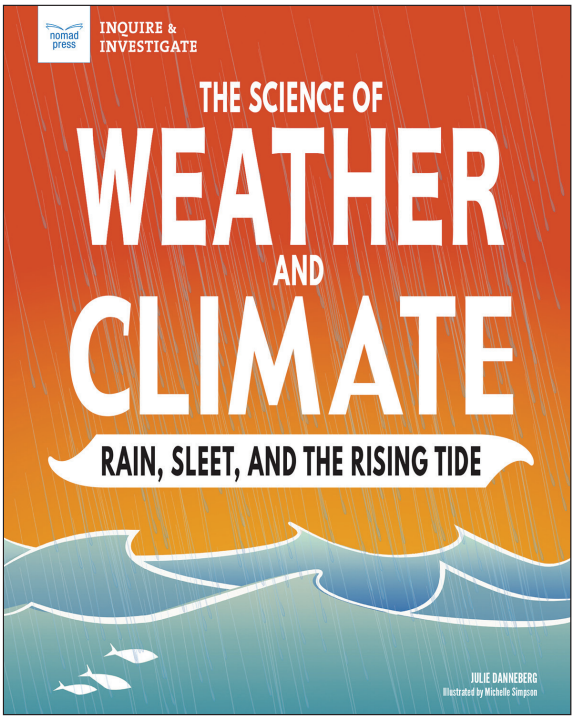


Age: 12–15
Grade: 7–10
Softcover: 9781619308503, $17.95
Hardcover: 9781619308473, $22.95
eBook: all formats available, $12.99
Specs: 8 x 10, 128 pages, color interior
Focus: Earth/Space Science | Environmental Science
GRL: Z

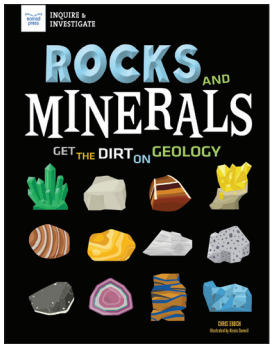
Take a look out your window. What's the weather like today? Has it changed much from morning to afternoon? What is the difference between weather and climate?

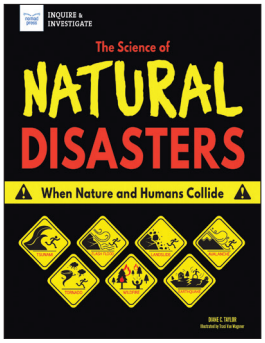
In ***The Science of Weather and Climate: Rain, Sleet, and the Rising Tide***, middle schoolers learn the science behind why it snows, how wind is formed, what makes one region hot and dry and another region cold and damp, plus lots more! By studying the atmospheric sciences of meteorology and climatology, kids learn to connect the weather they experience on a daily basis in their town with the changing conditions across the entire planet.

Science-minded STEM activities encourage young readers to think like scientists while critical thinking exercises, essential questions, fascinating facts, links to online resources, and more encourage readers to explore the ever-evolving dynamics of this incredible planet.

Learn more about *Weather and Climate* at https://nomadpress.net/nomadpress-books/the-science-of-weather-and-climate-rain-sleet-and-the-rising-tide

ALSO IN THE EARTH SCIENCE ISSUES SET





ROCKS AND MINERALS
PB: 9781619308541, $17.95
HC: 9781619308510, $22.95

NATURAL DISASTERS
PB: 9781619308589, $17.95
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ESSENTIAL QUESTIONS TO ASK

KEY VOCABULARY

air pressure, condense, climate change, equilibrium, geothermal, intermittent, mesocyclone, precipitation, synoptic

BEFORE READING

1 Establish Background Knowledge

a What's the difference between weather and climate? Why is this important to know?

b What effect does the sun have on the earth's weather? Why does the sun play such a crucial part of the earth's climate?

2 Skill Introduction

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

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

CCC: **CCSS.ELA-Literacy.L.8.4d** Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
CCC: **CCSS.ELA-Literacy.RST.6-8.8** Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

DURING READING

1 Check for Understanding

a What is the greenhouse effect and what does it have to do with climate?

b How does the work that meteorologists do today differ from the work they did in past decades?

c How did ancient people study the waether? How were their tools different from the ones we have today? Are there any tools that are still very similar?

CCC: **CCSS.ELA-Literacy.SL.8.4** Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

PS

How is a man walking a dog similar to the variability of daily weather versus the long-term trends of climate? Take a look at this short video to find out!

https://www.climatecentral.org/blogs/science-made-easy-climate-versus-weather

ESSENTIAL QUESTIONS TO ASK

AFTER READING

1 Summary and Expansion

a How do scientists form theories about what happened to the earth millions of years ago, before people even existed?

b What causes the seasons?

c What is the relationship between the atmosphere and the temperature on land?

d How does air move in the form of wind? What causes that?

e What are global air currents and why are they important?

f Why are hurricanes important to the earth's climate? What might the world be like if there were no hurricanes?

g What are cold fronts and warm fronts? What do they have to do with weather?

h What are some of the different kinds of winds? What does each mean for weather conditions?

i Why is water so important for the earth's climate? For human survival?

j How do clouds form? What do different types of clouds indicate in terms of the weather?

CCC: **CCSS.ELA-Literacy.WHST.6-8.4** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
CCC: **CCSS.ELA-Literacy.WHST.6-8.8** Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
CCC: **CCSS.ELA-Literacy.RST.6-8.3** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

COMMON CORE CONNECTIONS

Grade: 8 Language CCSS.ELA-Literacy.L.8.3,4,4a,4b,4c,4d,5,5b,5c,6

Grade: 6-8 Science & Technical Subjects CCSS.ELA-Literacy.RST.6-8.1,2,3,4,5,6,7,8,9,10

Grade: 8 Speaking & Listening CCSS.ELA-Literacy.SL.8.1,1a,1c,1d,2,3,4,5,6

Grade: 6-8 Writing HST CCSS.ELA-Literacy.WHST.6-8.1,2,4,6,7,8,9,10

COMMON CORE CONNECTIONS

Grade: 8 Language
CCSS.ELA-Literacy.L.8.3,4,4a,4b,4c,4d,5,5b,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 or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.
4a Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
4b Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., precede, recede, secede).
4c Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.
4d Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
5 Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
5b Use the relationship between particular words to better understand each of the words.
5c Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., bullheaded, willful, firm, persistent, resolute).
6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Grade: 6-8 Science & Technical Subjects
CCSS.ELA-Literacy.RST.6-8.1,2,3,4,5,6,7,8,9,10
1 Cite specific textual evidence to support analysis of science and technical texts.
2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
5 Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
6 Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.
7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
8 Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
10 By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

COMMON CORE CONNECTIONS

Grade: 8 Speaking & Listening
CCSS.ELA-Literacy.SL.8.1,1a,1c,1d,2,3,4,5,6

1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
1a Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
1c Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.
1d Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.
2 Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.
3 Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.
4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.
5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.
6 Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 8 Language standards 1 and 3 here for specific expectations.)

Grade: 6-8 Writing HST
CCSS.ELA-Literacy.WHST.6-8.1,2,4,6,7,8,9,10

1 Write arguments focused on discipline-specific content.
2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6 Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
9 Draw evidence from informational texts to support analysis reflection, and research.
10 Write routinely over extended time frames (time for 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.

nomad press ACTIVITY!

Project from *The Science of Weather and Climate: Rain, Sleet, and the Rising Tide*

Inquire & Investigate

MAKE YOUR OWN ANEMOMETER

Since wind is one of the key ingredients in the creation of weather, avid weather watchers measure its speed and direction. An anemometer is an essential tool for tracking the wind. You can make your own and use it for your observations.

- **Find the center of the plate.** Draw two perpendicular lines through it.
- **Using two-sided tape or a stapler, attach four cups to the plate at each point where drawn lines meet the edge.** The cups should be on their sides with the opening of each facing in the same direction. Mark one of the cups with a marker.
- **Push the pin in through the center of the plate.** Push it all the way through into the pencil's eraser.
- **Hold the cup anemometer outside and have a partner count how many times it goes around in 30 seconds.** How fast is it spinning? Which direction is the wind coming from? Record your observations in your science journal. How can you use the information to help predict weather?

To investigate more, try to determine the general speed of the wind using a guesstimate. Suppose you counted that the anemometer spun around 15 times in a minute and, according to your best guess, the wind was blowing at 10 miles per hour. You then know that 15 spins in a minute equal winds of about 10 miles per hour. Can you think of any other way to calibrate your anemometer?

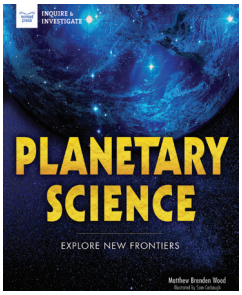
Ideas for Supplies

- sturdy paper plate
- pencil
- two-sided tape or a stapler
- 4 small paper cups
- push pin
- stopwatch
- weather journal

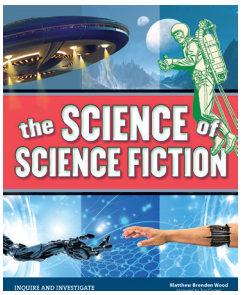
Want to learn more about anemometers? Check out this website!

Explain stuff anemometers

More Books About Science!



Author: Matthew Brenden Wood



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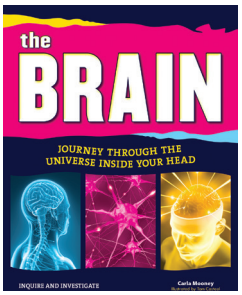

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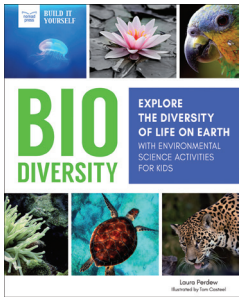

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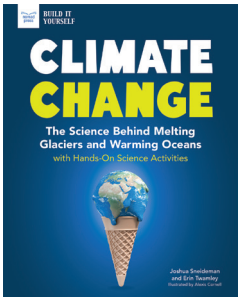

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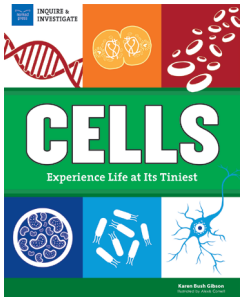

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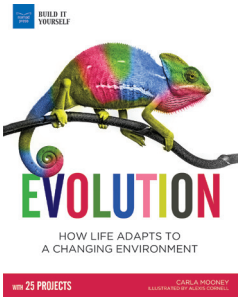

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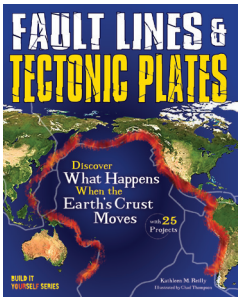

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