

Common Core and Next Generation Science
Standards-Aligned Discussion/Activity Guide
for Grades K-2

Bears Make the Best Science Buddies

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Written by Carmen Oliver
Illustrated by Jean Claude
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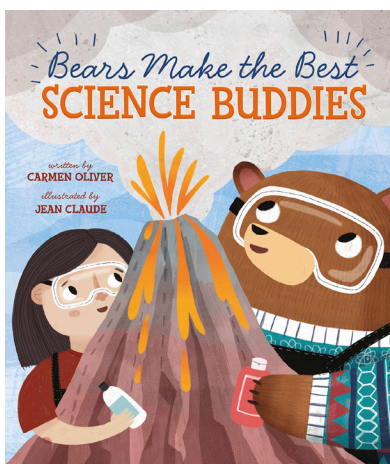
It's time for the first science lab, and nobody can agree on an experiment. But why pick just one when Bear is around? Bears makes the best science buddies, and Bear proves it by helping each group use the scientific method for its special experiment.

Guide created by
Debbie Gonzales, MFA



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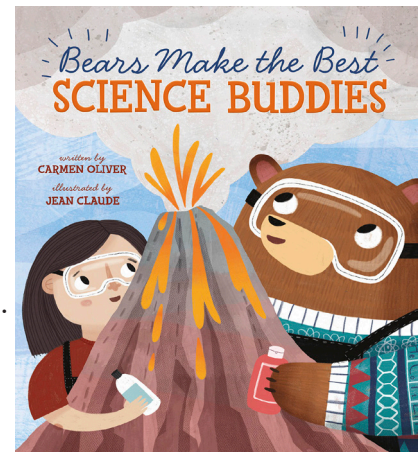
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Pre-reading Discussion

Consider the cover of the book:

- Identify the landform featured between the girl and bear on the cover. They seem to be watching an eruption of some kind. Are they in danger? Why or why not?
- What objects are both the girl and bear holding? Why are they wearing goggles? What are they doing?
- How are the girl and bear feeling? How do you know?
- The title of the book is *Bears Make the Best Science Buddies*. Discuss the benefits of partnering with a buddy during scientific exploration opportunities.
- Predict what this book is going to be about.



Meet the author – Carmen Oliver:

- Carmen is dedicated to life-long learning. Not only is she devoted to teaching young people about the joys of writing and reading, she also instructs adults through writing workshops. Consider how her love for learning might inspire her to write a book about scientific exploration.
- *Bears Make the Best Science Buddies* is the fourth book in a series centered around the themes of friendship, encouragement, and the willingness to try difficult things. How about you? Have you ever had an experience when someone encouraged you to keep trying, even when the task seemed hopeless to achieve? Explain your answer.
- Learn more about Carmen and her other projects by accessing her website at carmenoliver.com.



Meet the illustrator – Jean Claude:

- Illustrators tell stories with pictures. What story is Jean Claude telling in the illustration?
- Interpret the expressions on the characters' faces. Notice how Jean Claude created those expressions. Observe the arrangement of the lines and shapes on their faces. Explain how Jean Claude managed to communicate their emotions through art.
- One way to become an accomplished illustrator is to learn from techniques from accomplished illustrators, like Jean Claude by observing their use of color, line, and shape, for example. After closely examining the illustration on the cover, identify some of Jean Claude's artistic techniques you'd like to try.



Post-reading Discussion

But when everyone voted, Adelaide's prediction was . . . incorrect.

- To *predict* means to make a guess about something that might happen. In this scene, Adelaide made a prediction that the class would agree to do the milk and cookie experiment. What was the result of her prediction?
 - Why do you think Adelaide felt that the students would choose the milk and cookie experiment?
 - What would you choose, if you were a member of Adelaide's class? To do one or all of the experiments? Why?
 - Can you make a prediction why the students decided to do all the the experiments, rather than only one? Explain your answer.
-

"Four experiments in one lab?" Mrs. Fitz-Pea said. "That's highly improbable."

- Tell why, after picking the shortest stick, Theo chose to do all four of the experiments at once. How did the class respond to his decision? Explain your answer.
 - What would you do if you were Theo? Choose to do one experiment as a class, or all of them at once?
 - The word *improbable* means doubtful, unbelievable, or most likely won't happen. Explain why Mrs. Fitz-Pea feels doubtful that doing four experiments would be a good idea.
-

"And whether they're in a classroom or out in the woods, bears have a wild curiosity—just like scientists. They ask all the right questions."

- When a person is *curious* they are very interested in learning and discovering answers to fascinating things. Explain how being curious guides scientists as they engage in experimentation.
- Scientists explore scientific projects by asking questions. Rather than assuming the results of experiment is correct, they want to understand the process that occurred and understand why events took place. This type of curious thinking guides the Scientific Method. Discuss the benefits of the Scientific Method.



“And to answer those questions, bears use their five senses to observe every sight, sound, smell, taste, and touch. They use this evidence to make their best guess,” Adelaide continued.

- The word *evidence* means proof. The purpose of engaging in the Scientific Method is to prove whether a hypothesis—the initial prediction—is true or false. Explain the difference between simply enjoying an activity or looking at it with a scientific eye.
 - Consider how using the five senses enhances the process of the Scientific Method.
 - How do using the five senses as experimental tools help to prove an experiment’s hypothesis.
-

“Bears make the best science buddies because they know that every experiment leads to a new discovery.”

- The word *discovery* has two meanings. One definition means focus on learning, analysis, and findings. The other definition is to be surprised, delighted, and astonished. Which of the definitions do you think expressed Adelaide’s feelings about the Scientific Method? Could it be that she might choose both definitions? Explain your answer.
 - How about you? Do you find the scientific discoveries you make to be surprising, delightful, and astonishing? Explain your answer.
-



The Scientific Method Foldable

“And whether they’re in a classroom or out in the woods, bears have a wild curiosity—just like scientists. They ask all the right questions.”

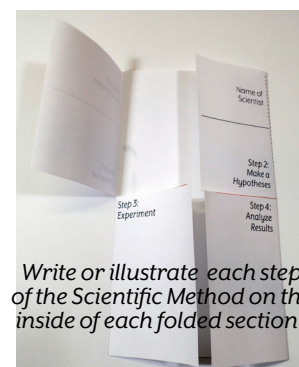
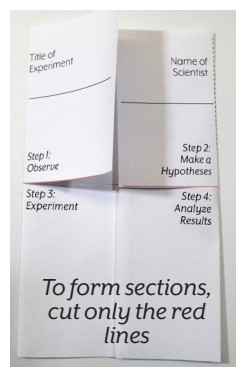
Objective: With guidance, plan and conduct an investigation in collaboration with peers using the templates included in this workbook.

Materials:

- The Scientific Method Foldable (Guide, pg. 7)
- *Bears Make the Best Science Buddies*, the book
- Scissors
- Pencil
- Markers

Procedure:

- Based on the scientific method presented in *Bears Make the Best Science Buddies*, students fold and trim the foldable as directed below.
- Note: The Scientific Method Foldable can be used with any experiment, not only those included in this guide.
- Using each step labeled on the sections of the foldable, instruct students to write and illustrate their responses for each step of the experimental process:
 - Closely **observe** each object being used in each experiment. Consider how each object will react as part of the particular experiment and why.
 - **Make a hypothesis** predicting the reason why certain objects will respond to the experiment.
 - Conduct the **experiment**, record ways that the objects react to the experimental process.
 - **Analyze the results** of the experiment by stating whether the hypothesis has been proven. Describe reasons why their hypothesis was proven or not.
- Instruct students to write and illustrate a short informational essay describing the process and results of their experiments. Have them share their findings with the class.



Name of
Scientist

Step 2:
Make a
Hypotheses

Step 4:
Analyze
Results

fold section



Title of
Experiment

Step 1:
Observe

Step 3:
Experiment

fold section



Magnetic & Non-Magnetic

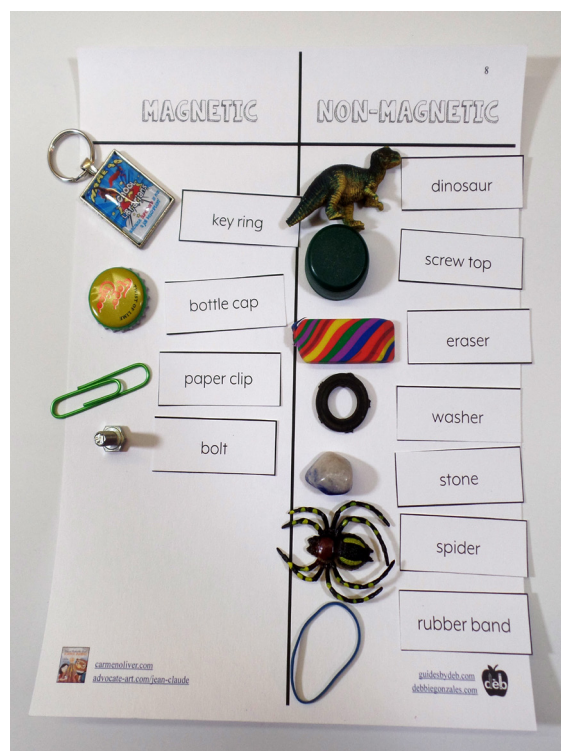
Objective: Analyze cause and effect relationships are routinely identified, tested, and used to explain change.

Materials:

- A magnet
- A collection of small objects
- Magnetic and Non-Magnetic Chart (Guide, pg. 9)
- Word Labels (Guide, pg. 10)
- The Scientific Method Foldable (Guide, pg. 7)
- Cardstock
- Scissors
- Pencil
- Markers

Procedure:

- Print the Magnetic & Non-Magnetic Chart and Word Labels on cardstock.
- Write the name of every object on a Word Label. Cut the Word Labels using scissors.
- Using the Scientific Method Foldable as a guide, ask students what they know about the object being magnetic or non-magnetic. Lead the discussion without clarifying terminology. Upon completion of the experiment, they will determine the difference between each.
- Instruct students to label the foldable with their name and experiment.
- Step 1: Observe – Instruct students to observe each object. Name each object and describe its consistency. What is it made of? How big is it? Record observations in the space provided on the foldable.
- Step 2: Make a Hypothesis – Instruct students to make a prediction regarding which items will be magnetic and those that are not. Tell them to state the reason why they think their prediction will be proven correct. Record hypothesis in the space provided on the foldable.
- Step 3: Experiment – Using the Magnetic and Non-Magnetic Chart as a guide, touch each object with the magnet. Sort them according on the chart. Place associating label beside the object. Explore reasons why some objects are magnetic while others are not. Record observations in the space provided on the foldable.
- Step 4: Analyze Results – Explain reasons why some objects were magnetic while others were not. Instruct students to compare results to their hypothesis. Record final analysis in the space provided on the foldable.
- Instruct students to write and illustrate an informative essay describing all aspects of the experiment. Have them share and discuss their findings with the class.



MAGNETIC

NON-MAGNETIC



Word Labels



Sink & Float

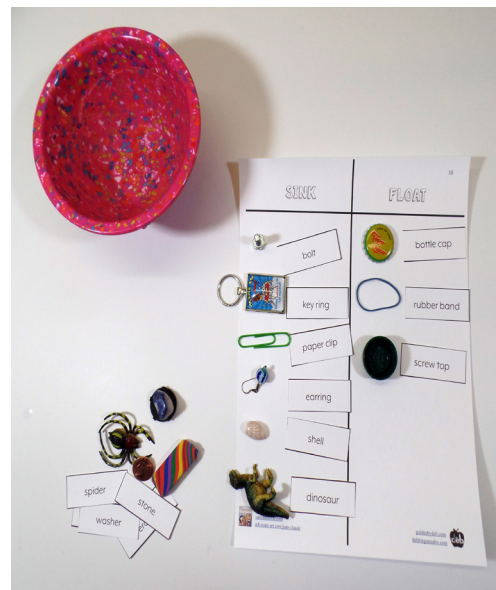
Objective: Analyze cause and effect relationships are routinely identified, tested, and used to explain change.

Materials:

- Bowl of water
- A collection of small objects
- Sponge or hand towel
- Sink and Float Chart (Guide, pg. 11)
- Word Labels (Guide, pg. 12)
- The Scientific Method Foldable (Guide, pg. 7)
- Cardstock
- Scissors
- Pencil
- Markers

Procedure:

- Print the Sink & Float Chart and Word Labels on cardstock.
- Write the name of every object on a Word Label. Cut the Word Labels using scissors.
- Using the Scientific Method Foldable as a guide, ask students what they know about objects that float and those that do not. Lead the discussion without clarifying terminology. Upon completion of the experiment, they will determine the difference between each.
- Instruct students to label the foldable with their name and experiment.
- Step 1: Observe – Instruct students to observe each object. Name each object and describe its consistency. What is it made of? How big is it? Record observations in the space provided on the foldable.
- Step 2: Make a Hypothesis – Instruct students to make a prediction regarding which items will float and those that are not. Tell them to state the reason why they think their prediction will be proven correct. Record hypothesis in the space provided on the foldable.
- Step 3: Experiment – Using the Sink and Float Chart as a guide, place an item in the bowl of water. Sort them accordingly on the chart. Place associating label beside the object. Explore reasons why some objects float while others are not. Record observations in the space provided on the foldable.
- Step 4: Analyze Results – Explain reasons why some objects float while others were not. Instruct students to compare results to their hypothesis. Record final analysis in the space provided on the foldable.
- Instruct students to write and illustrate an informative essay describing all aspects of the experiment. Have them share and discuss their findings with the class.



SINK

FLOAT



Word Labels



Common Core State Standards Alignment

		Discussion	Foldable	Magnetic/Non-Magnetic	Sink/Float
English Language Arts Standards » Reading: Literature					
CCSS.ELA-Literacy.RL.K.1	With prompting and support, ask and answer questions about key details in a text.	●	●	●	●
CCSS.ELA-Literacy.RL.K.3	With prompting and support, identify characters, settings, and major events in a story.	●	●		
CCSS.ELA-Literacy.RL.K.6	With prompting and support, name the author and illustrator of a story and define the role of each in telling the story.	●			
CCSS.ELA-Literacy.RL.K.10	Actively engage in group reading activities with purpose and understanding.	●	●	●	●
CCSS.ELA-Literacy.RL.1.1	Ask and answer questions about key details in a text.	●	●		
CCSS.ELA-Literacy.RL.1.3	Describe characters, settings, and major events in a story, using key details.	●	●		
CCSS.ELA-Literacy.RL.1.4	Identify words and phrases in stories or poems that suggest feelings or appeal to the senses.	●	●		
CCSS.ELA-Literacy.RL.1.7	Use illustrations and details in a story to describe its characters, setting, or events.	●	●		
CCSS.ELA-Literacy.RL.2.1	Ask and answer such questions as <i>who</i> , <i>what</i> , <i>where</i> , <i>when</i> , <i>why</i> , and <i>how</i> to demonstrate understanding of key details in a text.	●	●		
CCSS.ELA-Literacy.RL.2.3	Describe how characters in a story respond to major events and challenges.	●			
CCSS.ELA-Literacy.RL.2.7	Use information gained from the illustrations and words in a print or digital text to demonstrate understanding of its characters, setting, or plot.	●	●	●	●
English Language Arts Standards » Foundational Skills					
CCSS.ELA-Literacy.RF.K.1	Demonstrate understanding of the organization and basic features of print.	●	●	●	●
CCSS.ELA-Literacy.RF.K.2	Demonstrate understanding of spoken words, syllables, and sounds (phonemes).	●	●	●	●
CCSS.ELA-Literacy.RF.K.3	Know and apply grade-level phonics and word analysis skills in decoding words.	●	●	●	●
CCSS.ELA-Literacy.RF.K.4	Read emergent-reader texts with purpose and understanding.	●	●	●	●
CCSS.ELA-Literacy.RF.1.1	Demonstrate understanding of the organization and basic features of print.	●	●	●	●
CCSS.ELA-Literacy.RF.1.2	Demonstrate understanding of spoken words, syllables, and sounds (phonemes).	●	●	●	●
CCSS.ELA-Literacy.RF.1.3	Know and apply grade-level phonics and word analysis skills in decoding words.	●	●	●	●
CCSS.ELA-Literacy.RF.1.4	Read with sufficient accuracy and fluency to support comprehension.	●	●	●	●
CCSS.ELA-Literacy.RF.2.3	Know and apply grade-level phonics and word analysis skills in decoding words.	●	●	●	●
CCSS.ELA-Literacy.RF.2.4	Read with sufficient accuracy and fluency to support comprehension.	●	●	●	●
English Language Arts Standards » Writing					
CCSS.ELA-Literacy.W.K.2	Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.		●	●	●
CCSS.ELA-Literacy.W.K.5	With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed.		●	●	●



		Discussion	Foldable	Magnetic/Non-Magnetic	Sink/Float
English Language Arts Standards » Writing					
CCSS.ELA-Literacy.W.1.2	Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.		•	•	•
CCSS.ELA-Literacy.W.1.5	With guidance and support from adults, focus on a topic, respond to questions and suggestions from peers, and add details to strengthen writing as needed.		•	•	•
CCSS.ELA-Literacy.W.2.2	Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.		•	•	•
CCSS.ELA-Literacy.W.2.5	With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.		•	•	•
English Language Arts Standards » Speaking & Listening					
CCSS.ELA-Literacy.SL.K.1	Participate in collaborative conversations with diverse partners about <i>kindergarten topics and texts</i> with peers and adults in small and larger groups.	•	•	•	•
CCSS.ELA-Literacy.SL.K.2	Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.	•	•	•	•
CCSS.ELA-Literacy.SL.K.3	Ask and answer questions in order to seek help, get information, or clarify something that is not understood.	•	•	•	•
CCSS.ELA-Literacy.SL.K.4	Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.	•	•	•	•
CCSS.ELA-Literacy.SL.K.5	Add drawings or other visual displays to descriptions as desired to provide additional detail.		•	•	•
CCSS.ELA-Literacy.SL.K.6	Speak audibly and express thoughts, feelings, and ideas clearly.	•	•	•	•
CCSS.ELA-Literacy.SL.1.1	Participate in collaborative conversations with diverse partners about <i>grade 1 topics and texts</i> with peers and adults in small and larger groups.	•	•	•	•
CCSS.ELA-Literacy.SL.1.2	Ask and answer questions about key details in a text read aloud or information presented orally or through other media.	•	•	•	•
CCSS.ELA-Literacy.SL.1.4	Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.	•	•	•	•
CCSS.ELA-Literacy.SL.1.5	Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.		•	•	•
CCSS.ELA-Literacy.SL.1.6	Produce complete sentences when appropriate to task and situation.	•	•	•	•
CCSS.ELA-Literacy.SL.2.1	Participate in collaborative conversations with diverse partners about <i>grade 2 topics and texts</i> with peers and adults in small and larger groups.	•	•	•	•
CCSS.ELA-Literacy.SL.2.2	Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.	•	•	•	•
CCSS.ELA-Literacy.SL.2.3	Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.	•	•	•	•
CCSS.ELA-Literacy.SL.2.4	Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.	•	•	•	•
CCSS.ELA-Literacy.SL.2.6	Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.	•	•	•	•



Next Generation State Standards Alignment

			Discussion	Foldable	Magnetic/Non-Magnetic	Sink/Float
K-PS2 Motion and Stability: Forces and interactions						
K-PS2-1	Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.			•	•	•
	Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.			•	•	•
	* With guidance, plan and conduct an investigation in collaboration with peers.			•	•	•
K-PS2-2	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull			•	•	•
	Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.			•	•	•
	* Analyze data from tests of an object or tool to determine if it works as intended.			•	•	•
Cause and Effect						
	Simple tests can be designed to gather evidence to support or refute student ideas about causes.			•	•	•

