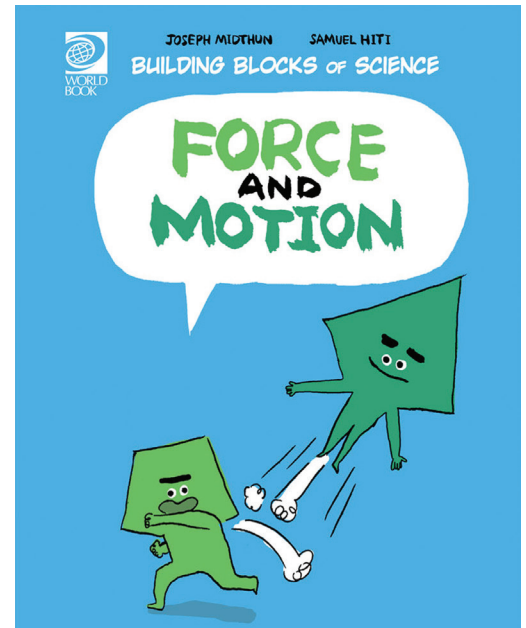


## BUILDING BLOCKS OF SCIENCE PHYSICAL SCIENCE LESSON PLAN & GUIDED DISCUSSION

Each of the 10 *Building Blocks of Science* volumes features a whimsical character which guides the reader through a physical science topic. This series is perfect for students across a spectrum of reading comprehension and science mastery levels.



General Information	
<b>Title:</b>	Marble Madness Game
<b>Materials:</b>	<ul style="list-style-type: none"> <li>• Several large books</li> <li>• Marbles</li> <li>• Stopwatch</li> <li>• Masking tape</li> <li>• 3 or 4 different materials for the track</li> </ul> <p>Suggestions:</p> <ul style="list-style-type: none"> <li>o mirror</li> <li>o top of a plastic bin</li> <li>o strip of flannel</li> <li>o towel</li> <li>o sheet of cardboard</li> </ul> <ul style="list-style-type: none"> <li>• index cards</li> <li>• markers or felt pens</li> </ul>
	In this activity, kids will race marbles on various “racetracks.” The idea is to test marbles that start out going at the same speed and determine the effect of friction by using various materials for the racetrack.

Lesson	
<b>Group discussion questions:</b>	<p>Make sure your students have grasped the major concepts of this lesson through an informal group discussion. This is an opportunity for you to highlight the most important points in the book and to clarify any uncertainties your students may have. Use the questions below as a guideline but feel free to generate your own!</p> <ul style="list-style-type: none"> <li>• How would you define motion? What are the two important parts?</li> <li>• What is inertia?</li> <li>• Tell me about friction. What about how friction affects motion?</li> <li>• How many “simple machines” can you name? Give me some real-life examples of those simple machines.</li> <li>• What kind of simple machine(s) are used in this experiment?</li> </ul>
<b>Procedure</b>	<p>Set up a stack of books about 6 inches high. Lean another thin book, like the <i>Building Blocks of Science</i> book—or something else durable and flat—to create a ramp. At the bottom of the ramp, you will lay down your racetrack, with a piece of masking tape at the end to indicate the finish line. Make sure your racetrack material reaches the finish line. Your ramp needs to be steep enough so that the marble reaches the finish line, no matter which racetrack material is used.</p> <p>Place the marble at the top of the ramp and let it go (don't push it). This will keep the marble's start speed consistent. Record the time it takes to get the marble to the finish line using the stopwatch. You can write this time up on the board.</p> <p>Change out the racetrack for a different material and continue to record the marble's finishing time.</p> <p>Ask students what has changed and to analyze why that may have happened.</p>

<p><b>Vocabulary for the Word Wall:</b></p>	<p>As a class, decide on a few vocabulary words that were particularly relevant to this activity. For example,</p> <ul style="list-style-type: none"> <li>• acceleration</li> <li>• gravity</li> <li>• speed</li> <li>• friction</li> <li>• mass</li> </ul> <p>Pass out a few index cards and ask students to write the vocabulary word on the front of the card and its definition on the back. Students can refer to the glossary on p. 30 as a reference. There are probably not enough words for everyone in the class to make a card so just be mindful that each kid gets a turn at some point during this unit.</p> <p>Post the cards on a “WORD WALL” bulletin board in your classroom.</p>
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**Common Core Standards highlighted in this lesson**

<p><b>Standards:</b></p>	<p><b>ELACC4RI1</b> Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.</p> <p><b>ELACC4RI2</b> Determine the main idea of a text and explain how it is supported by key details; summarize the text.</p> <p><b>ELACC4SL1</b> 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.</p>
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