

## Module 2: Motion

### Grade 3



In this module, students investigate the question “What variables affect ball motion?” in order to learn about the predictability of motion. To assist the students in precise measurements of time, they are taught how to read and use timers and report times to the nearest tenth of a second. For their initial observation, students are shown an experiment in which there are two ramps set up: one with outdoor carpet and one with shag carpet. Students use the timers to time how long it takes for a ball to roll down each ramp and hit a board, where it takes longer for the ball to travel down the shag carpet. They then observe a ball rolling down each ramp at the same time to prove that the ball takes longer to hit the board when rolling on shag carpet. This allows students to test how the material a ball rolls on affects the speed it travels and learn that smoother materials like the outdoor carpet allow the ball to travel faster. Students learn more about ball motion by planning and carrying out experiments in groups of about five students each. The variables that they are able to investigate include ball mass, ball circumference, ramp height, ramp length, and run length (the distance the ball travels). At the end of the investigation, each group will give a poster presentation to teach the rest of the class about the variable they changed and what their experiment shows from their results. Also, on the final day of the module students discuss the effects of different variables on speed, such as ramp height, ball mass, and run material. During this discussion students will use their findings to predict what values of these variables will cause a ball to travel at the fastest and slowest speed. This module continues to enforce the importance of running multiple trials for experiments and using the median to represent their data. The scientific practice this module focuses on is questions, including whether a question is testable or not testable. In this module the Next Generation Science Standard performance expectation 3-PS2-2 is covered as well as the Common Core Mathematics Standard 3.NF-1.