

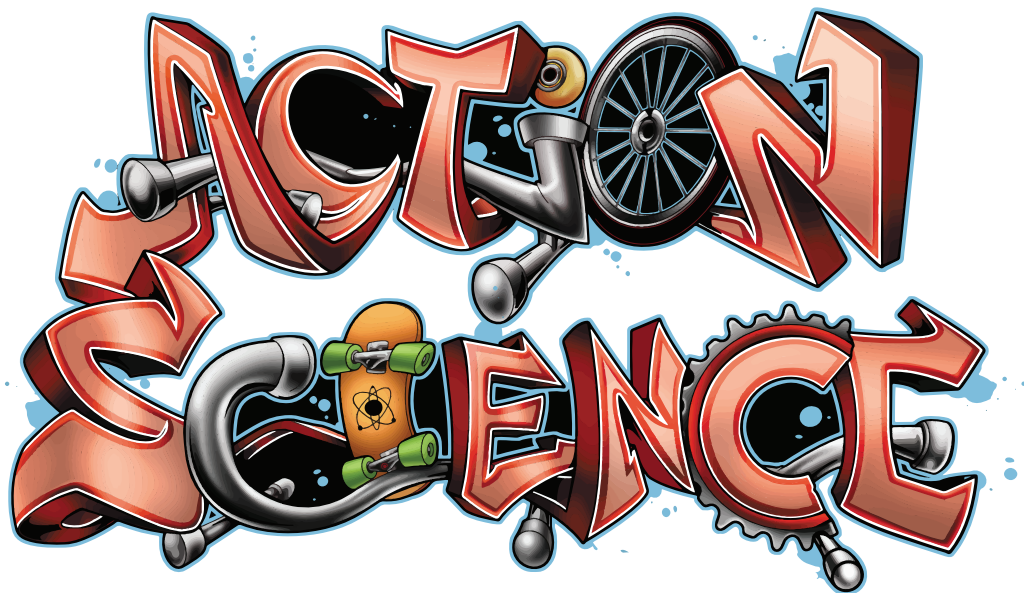


dr. skateboard's **ACTION** **SCIENCE**



Motion

Written by Bill Robertson, Ph.D.
Illustrated by Tania Sanchez

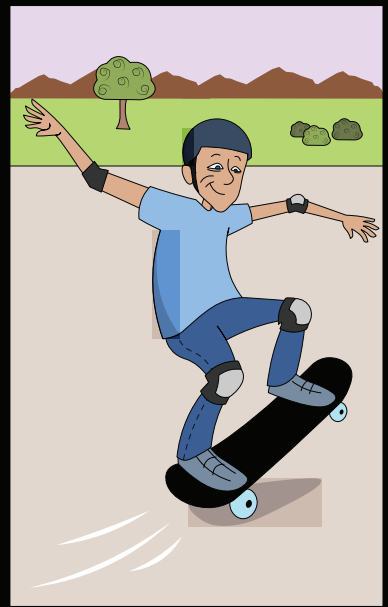
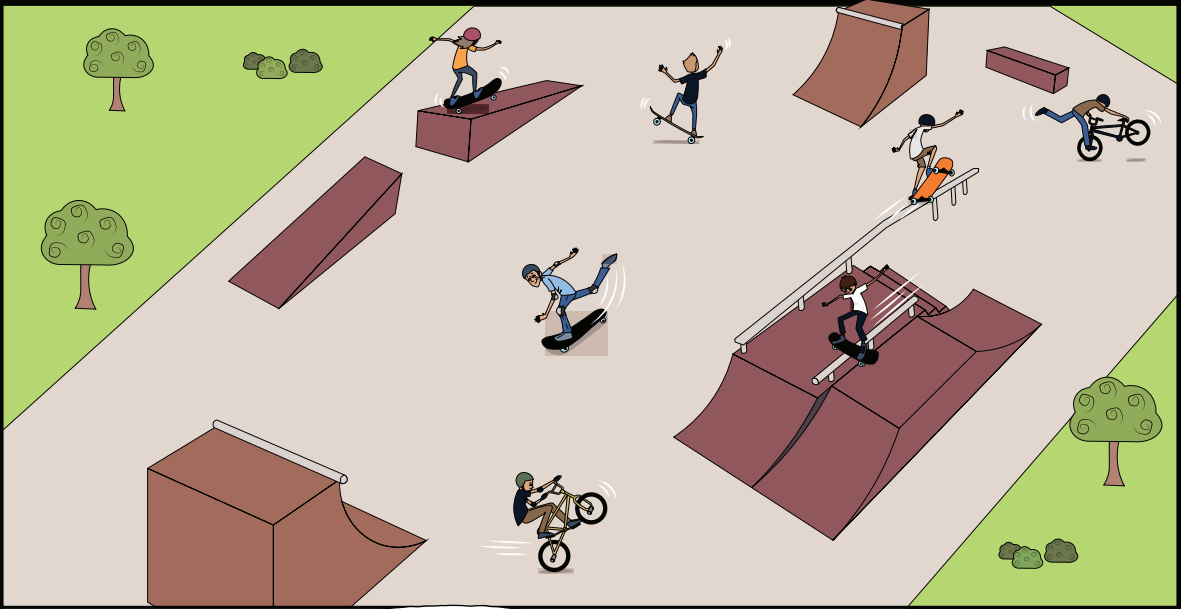


About Action Science

How can you get young people interested in science and mathematics? What efforts are there to integrate the experiences of middle school students into the things they need to do and learn in school? How can action sports, like skateboarding and bicycle motocross (BMX), be used to teach physics, algebra, data collection, and help students to grow in their engagement and motivation in science and mathematics? The answer lies in part to an approach I have termed as Action Science.

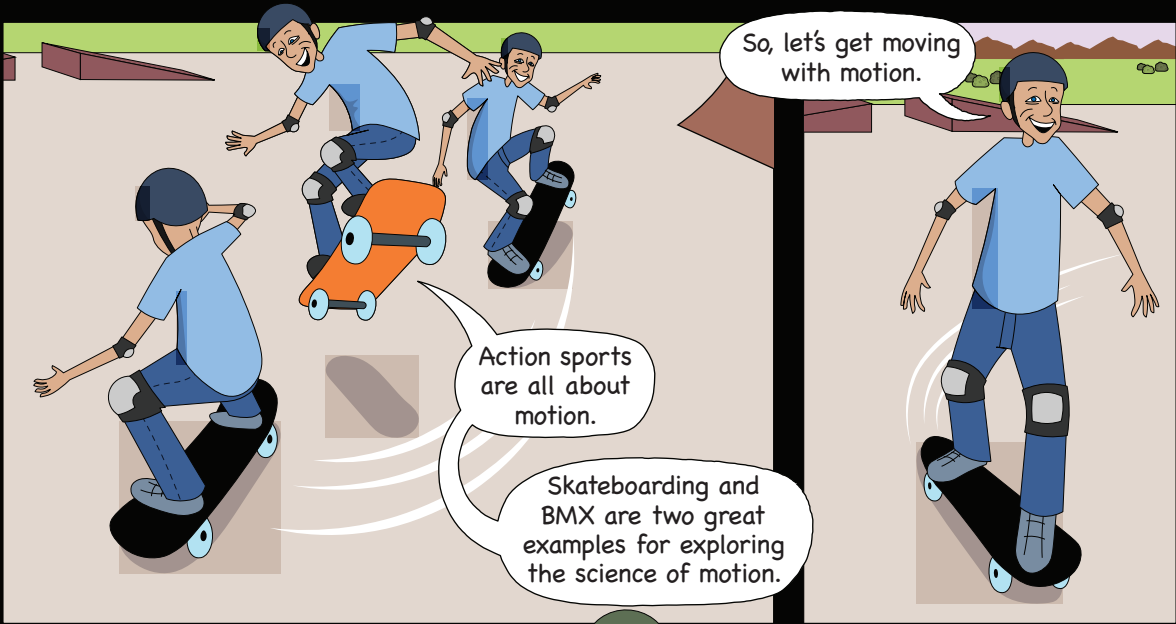
Action science is an example of the use of transformative educational strategies to enhance the study of science for K-16 students. The term “action science” can be defined as the use of familiar objects, circumstances and situations within the lives of students in order to explain specific concepts in science built around student interests, including action sports like skateboarding and BMX.

In schools, the approach to these topics is also done in very traditional manners that employ content delivery mechanisms that are often not put in relevant terms for the K-16 learner.

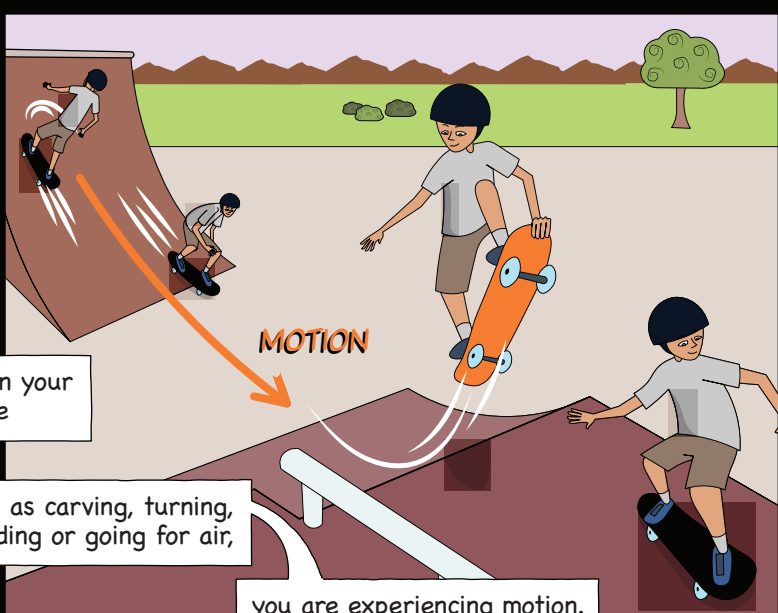
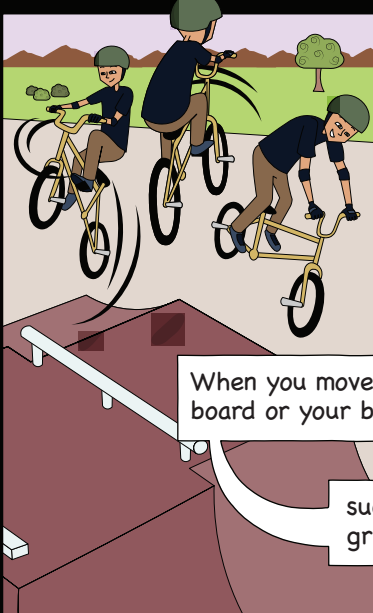
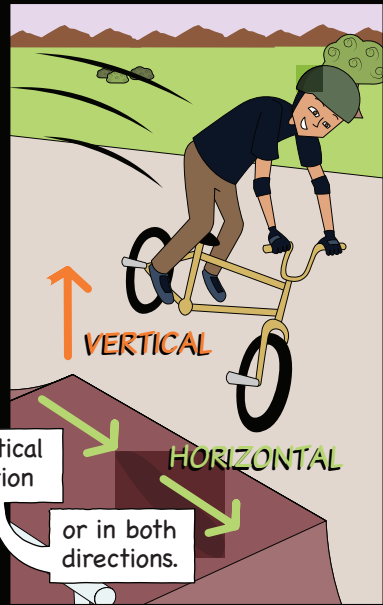
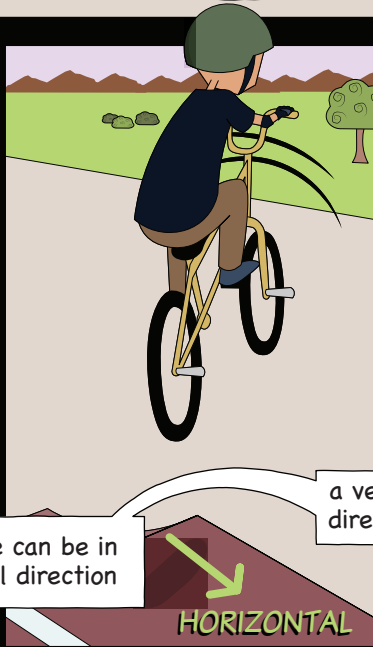
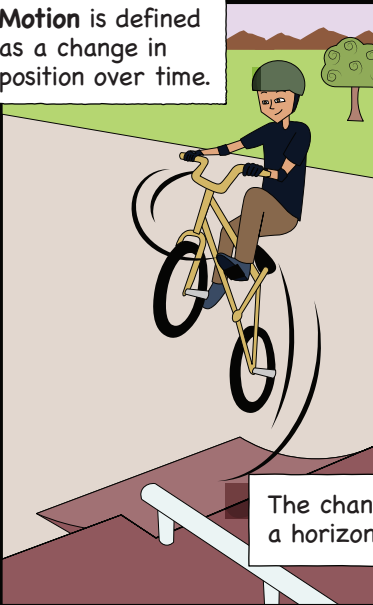


a comic book series that explores the concepts of physical science found in skateboarding and BMX.



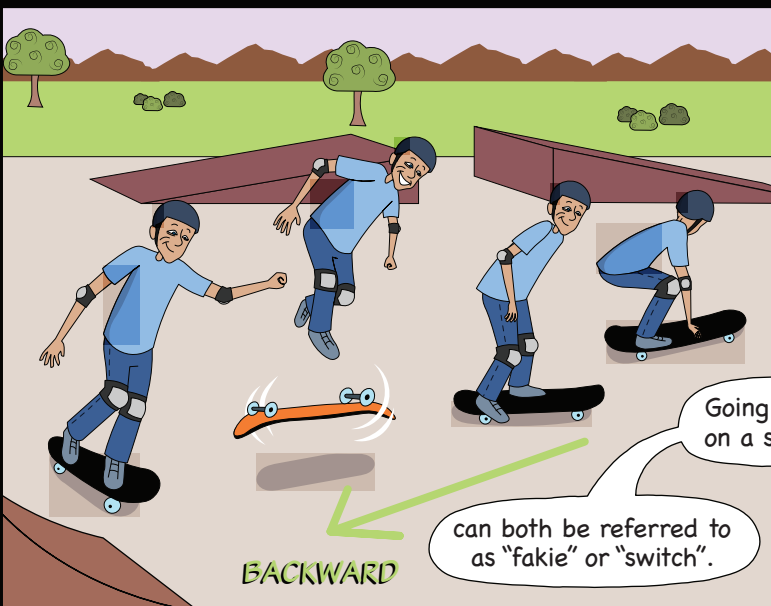
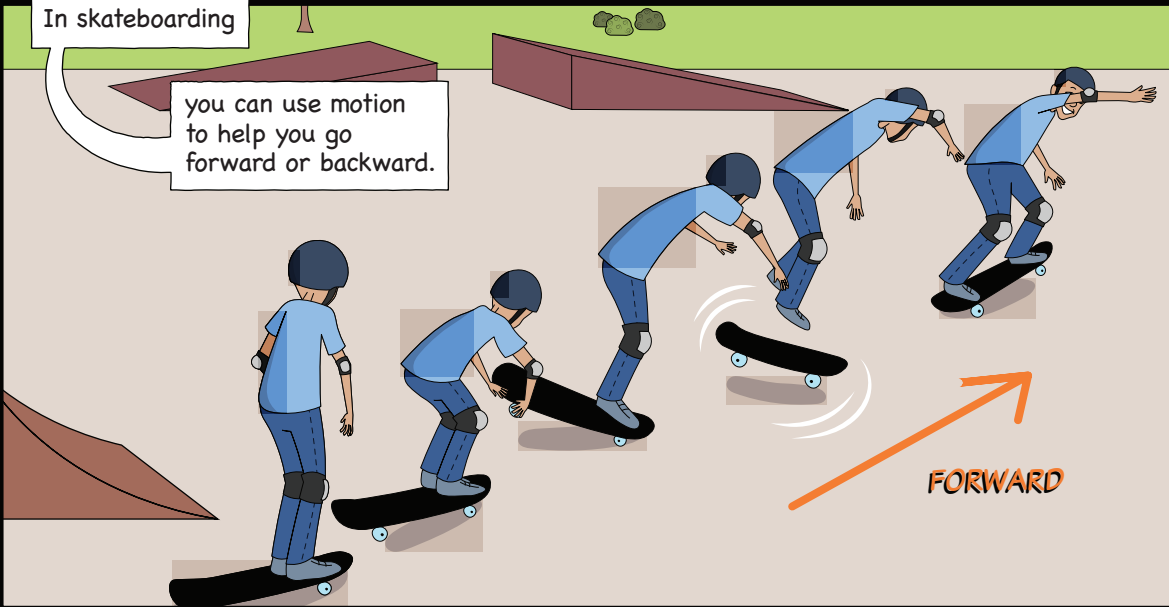


Motion is defined as a change in position over time.



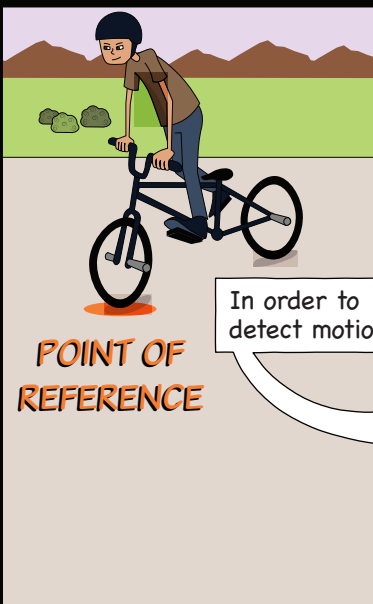
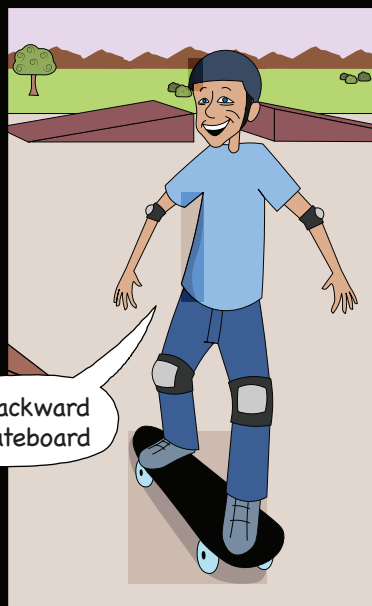
In skateboarding

you can use motion to help you go forward or backward.



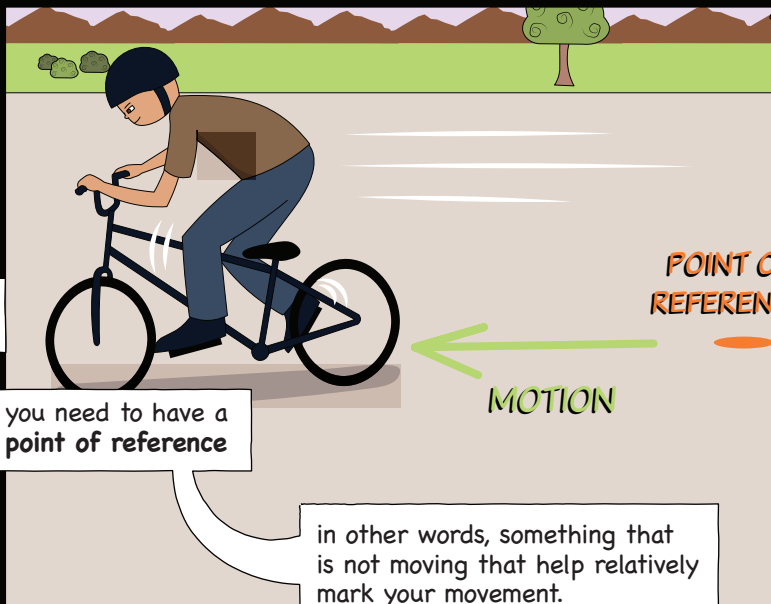
Going backward on a skateboard

can both be referred to as "fakie" or "switch".



In order to detect motion

POINT OF REFERENCE

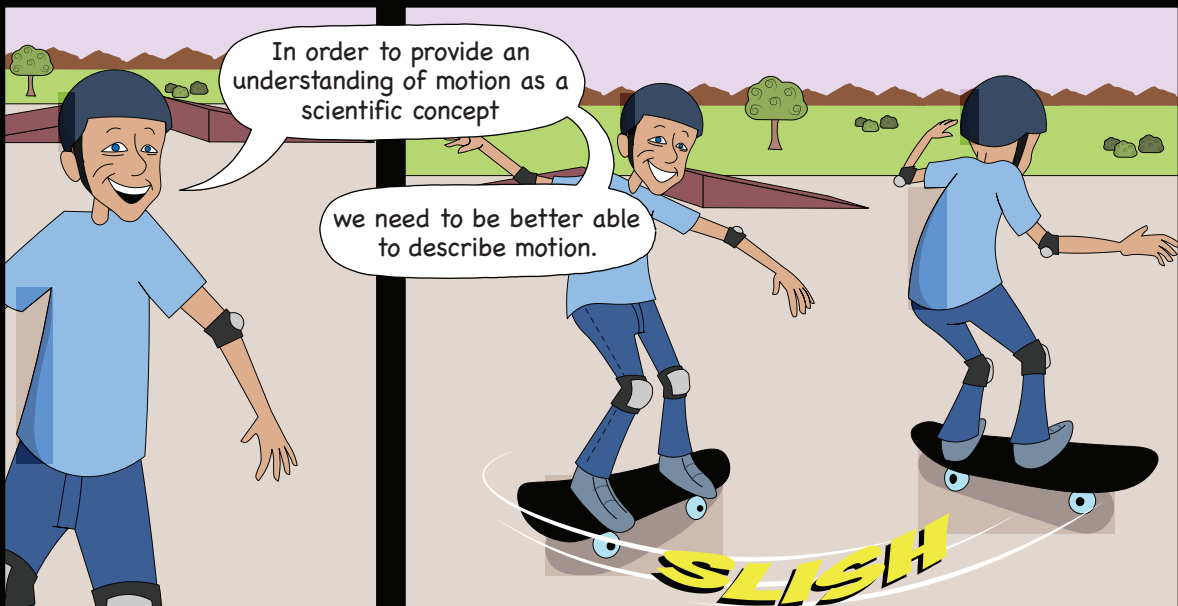
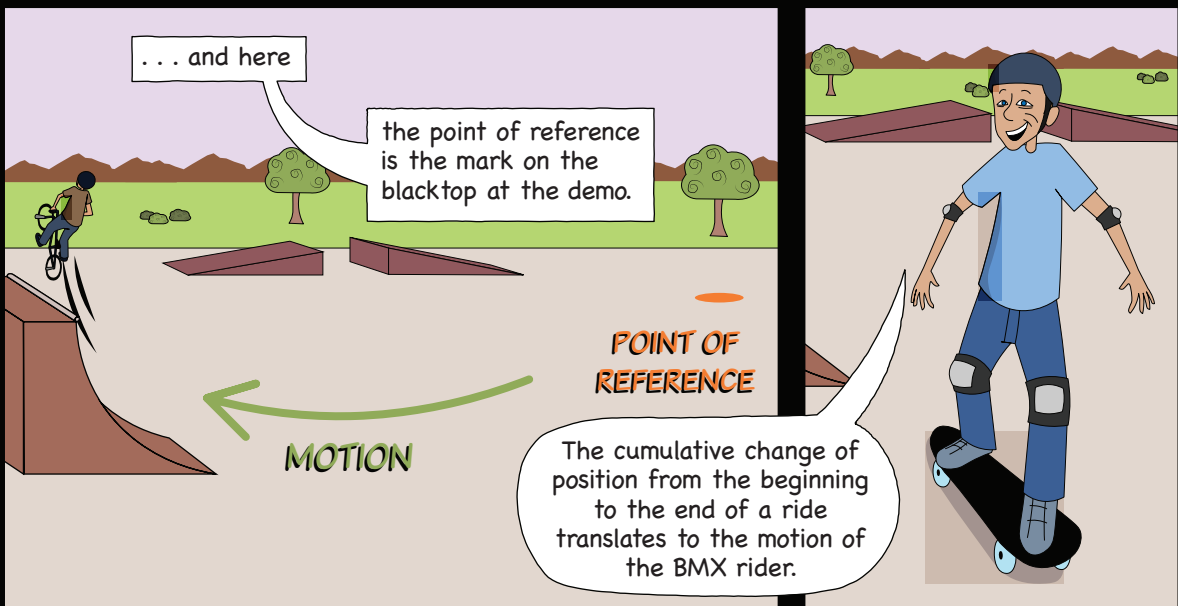
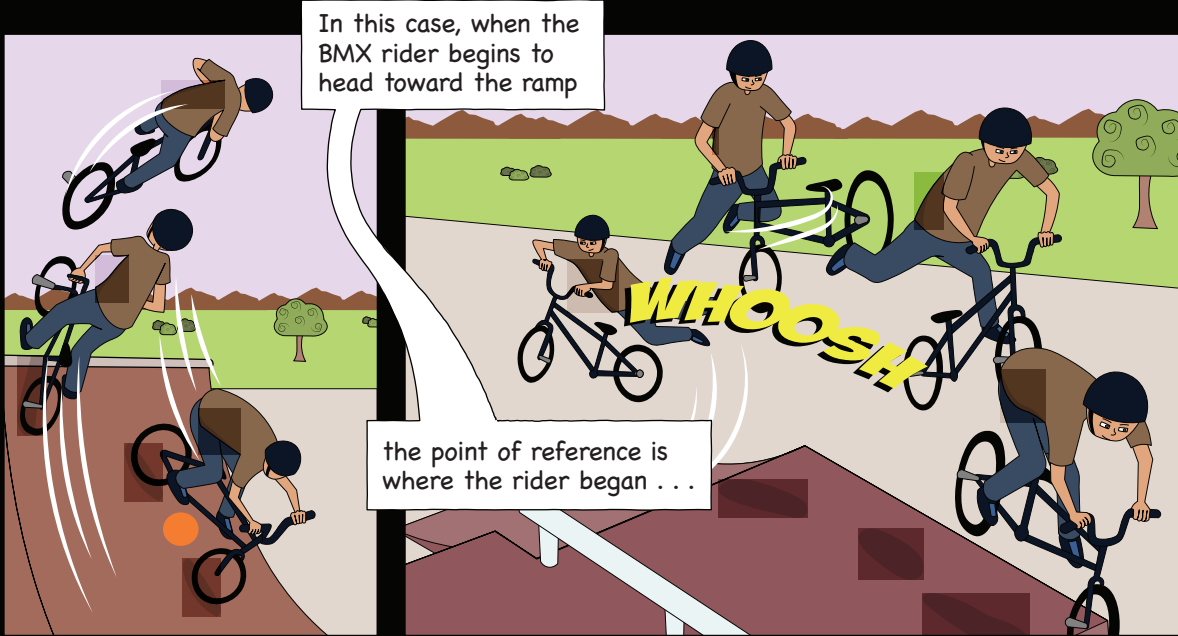


POINT OF REFERENCE

MOTION

you need to have a point of reference

in other words, something that is not moving that help relatively mark your movement.





About Dr. Skateboard

Dr. Skateboard is Bill Robertson, a Ph.D. in Education and a skateboarder for over forty years. Bill has done hundreds of demonstrations nationally and internationally in festivals, events and in academic settings. He has performed for thousands of students in elementary, middle, and high school levels throughout the United States, in Canada, Mexico and into South America. Bill has been an educator for over twenty-five years. His academic areas of expertise are science education, curriculum development and technology integration. He also teaches and does research in the areas of problem-based learning and action science.



$$\Sigma F_x = ma$$

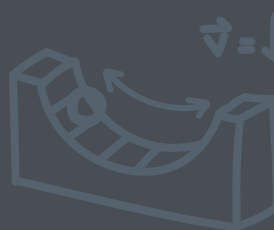
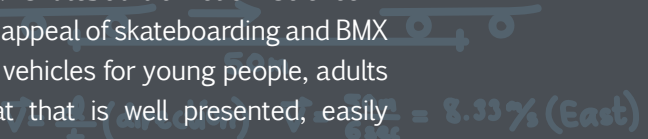
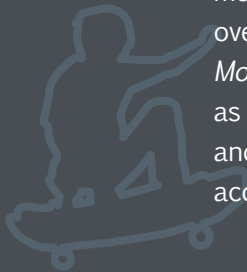
$$P \quad f = ma$$

$$\Sigma F_y = ma$$

$$N - mg = ma = 0$$



Dr. Skateboard's Action Science – Motion comic book is the third installment of a series of graphic novels based on the fundamental physical science areas, which include forces, motion, Newton's Laws of Motion and simple machines. The overarching theme of *Dr. Skateboard's Action Science – Motion* comic book is the appeal of skateboarding and BMX as teaching and learning vehicles for young people, adults and families in a format that is well presented, easily accessible and conceptually correct.



$$s = \frac{d}{t}$$

$$F = ma$$

$$v = \frac{d}{t} \text{ (direction)}$$



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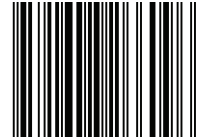
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