Diet Coke and Mentos Race Car

Activity Leaders: Jocelyn, Kellen and Mike

Activity: Choose which race car powered by the Diet Coke and Mentos reaction will go the fastest!

Directions: Choose which car you think will go the fastest. You have a choice of two wheel configurations (big wheels in front, big wheels in back). Once you select the car you want bring it to the starting line. We'll load it up with Mentos and watch it go! The winner is the one who crosses the finish line fastest.

Results:

Which car did you pick? (Circle one)

Big wheels in front Big wheels in back Two small wheels

What was your time?

_____

We can calculate the *velocity* (or the *speed*) of the car by dividing the total distance travelled by the time it took to get there. **What was the velocity of the car?**

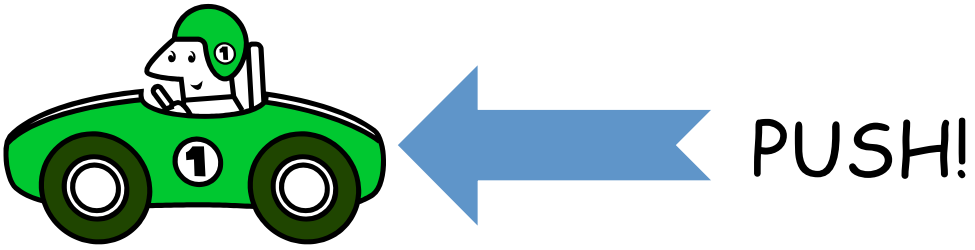
_____ feet / _____ seconds = _____ feet/second

Notice that velocity is measured in (distance) per unit of (time).

Did the other team's car go faster? What did they do differently?

How does it all work?

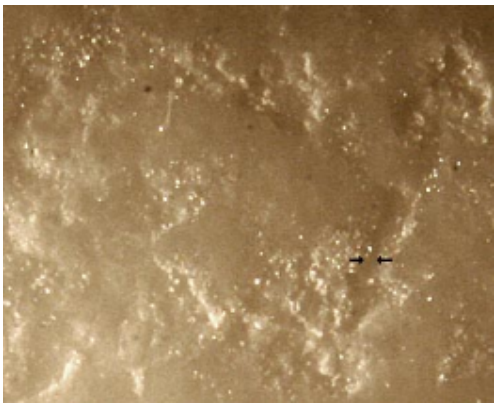
Part of what we do in physics is study how objects move. Let's look at the car.



The car naturally wants to stay still and will only move when we push it. When the jet of Diet Coke sprays out of the nozzle in the back it's as if someone is constantly pushing the car forward and the car moves. We also calculated the *velocity* (or speed) of the car. Notice that the units of velocity are distance per time (eg. Feet/second, miles per hour, meters per second, etc.). Can you think of other things that are measured in units of distance per unit time?

Why does the Diet Coke and Mentos combination produce a huge jet?

One popular explanation as to why the Diet Coke and Mentos reaction works is that the Mentos has a special surface. In each bottle of Diet Coke there are thousands of dissolved gas bubbles. Usually you don't see the bubbles in the bottle because they need a surface to form on. It turns out that the surface of a Mentos candy is exactly the kind of surface the bubbles need to start forming. Even though the candy looks and feels smooth there are actually tiny little bumps on the surface (the bumps are so small that you need a microscope just to see them!). When the Mentos is dropped into the Diet Coke the gas bubbles "find" the surfaces on the candy and form really quickly. How quickly? In the span of a few seconds *several thousand* bubbles form! This is the foamy jet that comes out of the bottle.



This is what the Mentos looks like up close! (Notice the bumps!)
(http://www.waynesthisandthat.com/images/_mg_9265.jpg)

There is a lot of information on the internet about Diet Coke and Mentos!
Here are two sites that do a pretty good job of explaining it:
http://www.waynesthisandthat.com/mentos.htm
http://www.stevespanglerscience.com/experiment/00000109