UNIVERSITY of WISCONSIN UWMILWAUKEE | Manfred Olson Planetarium

How Fast Do Stars Move?

How Fast Can You Throw?

Let's find out how fast you are! Try either of these fun activities with members of your family. You'll need a ball, tape measure, chalk or tape, a helper, and a stopwatch (most cell phones have one) for both activities.

Throw a Ball at a Wall

Steps:

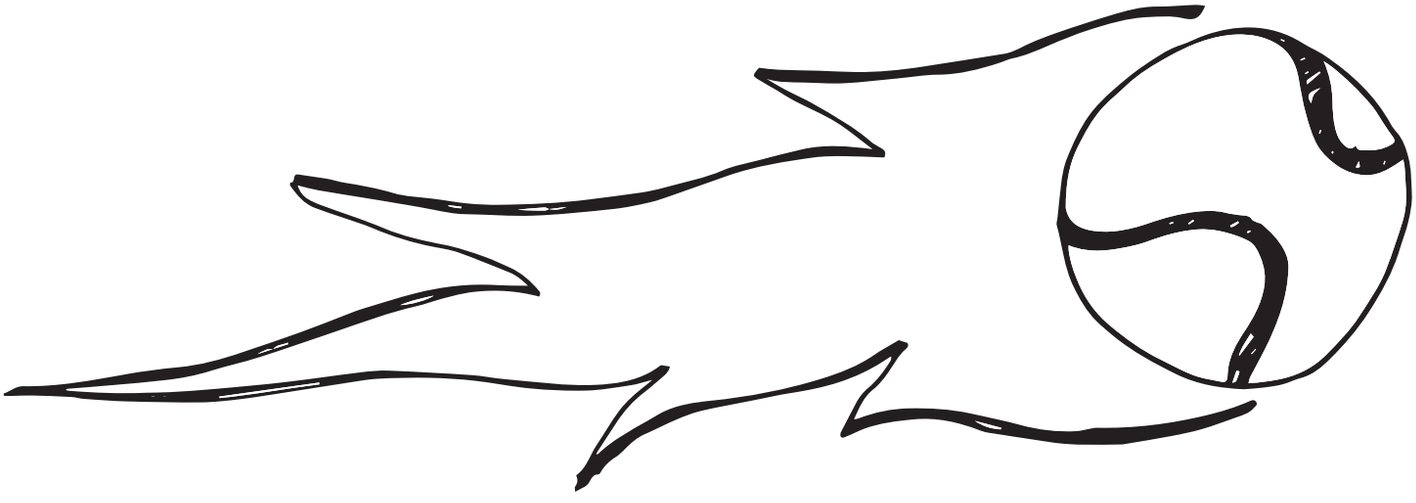
1. Start by measuring 17 feet 7 inches from a wall outside (best to find one with no windows) and mark a line there with chalk or tape

2. Stand on the line and have someone be ready to start the timer when you throw

3. Throw the ball towards the wall and record the time in seconds that it takes to hit the wall (stop the timer when the ball hits the wall)

4. Speed is the distance travelled divided by the time the object travelled. To calculate how fas you threw the ball in miles/hour, divide 12 by your time in seconds.

FUN FACT: The record for fastest pitch is held by Aroldis Chapman at 105.1 miles/hour.



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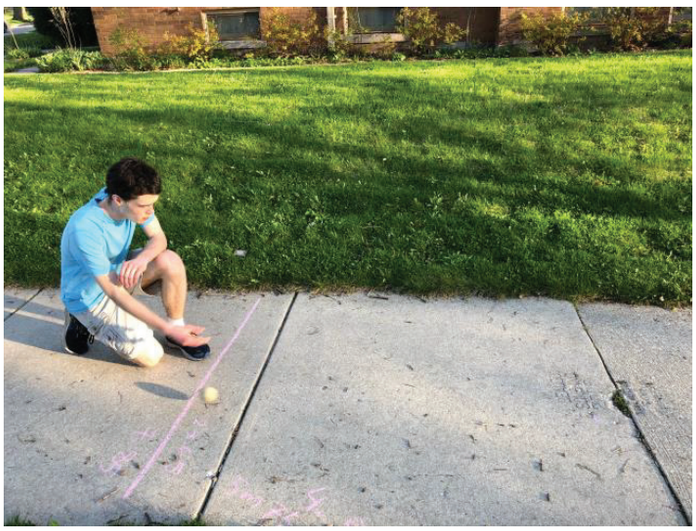
Roll a ball underhand as far as you can

Steps:



1. This activity works best if you can stand on a smooth flat surface like a sidewalk.

2. Start by drawing a line with chalk or use one of the seams between sidewalk slabs.

3. Stand about two large steps behind the line and roll a ball toward the line. Your helper should start a stopwatch when the ball crosses the line and stop it when the ball comes to rest. Then, use a tape measure to find how far the ball rolled from the line in inches.

3. Now, we'll use math to figure out your speed in miles per hour – the same way that cars measure their speed! You can use a calculator on a cell phone to help.

4. First, divide your total number of inches measured by the total number of seconds measured. This will give you the number of inches per second (inches/second).

5. Now, multiply your number of inches per second by 3,600. We are using this number because there are 3,600 seconds in an hour. Now we have the number of inches per hour.

6. Next, divide that number by 63,360, because there are 63,360 inches in a mile. This last step will give us the number of miles per hour!

Here is the full equation you just used:
speed (in miles/hour) = (inches/seconds) x (3,600 seconds/1 hour) x (1 mile/63,360 inches)

- For example, Dr. Jean's son rolled a ball that landed 1,128 inches away from the line in 7.85 seconds.

Divide 1,128 (total number of inches) / 7.85 (total number of seconds) = 143.69 inches/second
Multiply 143.69 in/sec x 3,600 = 517,284 inches/hour
Divide 517,284 in/hr / 63,360 = **8.16 miles per hour**

- Dr. Jan's son rolled the ball at 8.16 miles per hour.

For other fun activities including virtual tours of the night sky, check our UWM Planetarium website: https://uwm.edu/planetarium/