

MATH

Where Math Gets Real™

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ALGEBRA

The legend of King Arthur hits the big screen

GEOMETRY

Compare the volumes of balls used in different sports

PERCENTS

You Can't Catch Me!

Even the most fearsome predators aren't 100% successful when hunting





See teams from around the world face off at the 2017 KIN-BALL World Cup in Japan.



This Game Is HUGE!

“OMNIKIN RED!” You hear the shout before a massive ball flies overhead. You slide across the gym floor toward it and throw your leg under the ball. You can’t let it touch the floor. If it does, both of the other teams will get a point.

Some of you might already be playing this game in your gym classes. It’s called KIN-BALL. A Canadian physical education teacher invented the game in 1986—and it’s growing in popularity. “It’s a great team sport,” says Patrick Krech, a physical education teacher at the Butterfield School in Libertyville, Illinois. He’s been teaching the game to his students for 15 years.

KIN-BALL is a lot like volleyball, minus the net. The goal is to make sure

the ball never touches the floor. Three teams of four players play at a time. The teams take turns hitting the ball across the court. If the ball touches the floor, goes out of bounds, or isn’t hit far enough, the other two teams get a point. This system keeps all the teams moving and included in the game.

It has been only three decades since the game was invented, but more than 4 million people play KIN-BALL. Top players compete in a World Cup, which takes place every two years. During the 2017 World Cup in Tokyo, Japan, players came from countries around the world, like France, Singapore,

China, the Czech Republic, and Canada to compete.

Maybe Krech’s students will play in the World cup one day. Right now, he has started an intramural competition at the Butterfield School. It takes place before the school day starts. It’s been easy for the students to learn how to play. Krech says the hardest part is getting used to having three teams and figuring out winning strategies.

“We’re having a good time,” he says. “The students are coming an hour before school at 7 a.m., so we’re doing something right!”

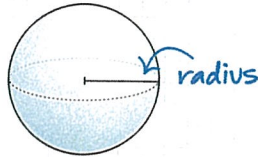
—Marissa Shieh



KIN-BALL uses one of the largest balls of any sport! Here's how to find the volume, or the amount of space inside a sphere.

Sphere volume

$$V = \frac{4}{3} \times \pi \times \text{RADIUS}^3$$



EXAMPLE: The KIN-BALL ball is nearly as tall as a player! It has a radius of 2 feet. What is its volume?

Do the MATH!

Rewrite the formula with the given radius. Use 3.14 for pi.

$$\begin{aligned} \text{Sphere Volume} &= \frac{4}{3} \times 3.14 \times (2\text{ft})^3 \\ &= \frac{4}{3} \times 3.14 \times 8\text{ft}^3 \\ &\approx 33.49 \text{ feet}^3 \end{aligned}$$

→ So the volume of a Kin-Ball is 33.49 cubic feet.



Use the formula above to find the volume of select sports balls. Round answers to the nearest hundredth. Use 3.14 for pi.

1 Field hockey is the oldest continuously-played ball sport. It's hard to pinpoint when and where it started. But it's closely related to the Ethiopian game of genna, which has been played for thousands of years. Modern field hockey balls have a maximum radius of 1.48 inches. What's their volume?

13.57 in³ ✓

2 Golf has been played since the 14th century. But the modern golf ball was born in 1898, when a worker at the B.F. Goodrich Company wound rubber thread into a ball and bounced it. Since then, all golf balls have a radius of 0.84 inches. What's their volume?

2.48 in³ ✓

3 Basketball was invented by a PE teacher named

James Naismith in 1821. Early basketballs were made of leather with a leather bladder inside. Today's balls have a radius of 4.7 inches. Some are still made of leather and others are made of synthetic rubber. What's the volume of a basketball?

434.67 in³ ✓

4 Mario Demers, the man who invented KIN-BALL, also came up with a cooperative water polo game. A water polo ball has a radius of 4.3 inches. What is its volume?

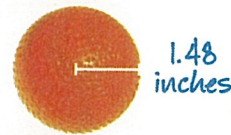
5 The Wiffle ball was invented in a family's backyard. They wanted a ball that they could use to pitch curveballs without breaking windows! Wiffle balls have a *diameter* anywhere between 2.87 inches and 3.15 inches. What is the difference in volume between the smallest and the largest Wiffle balls?

RADI OF SELECT SPORTS BALLS

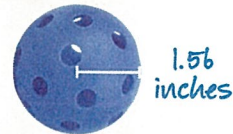
GOLF



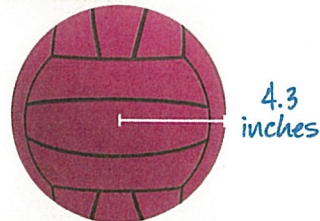
FIELD HOCKEY



WIFFLE BALL



WATER POLO



BASKETBALL

