



是真的吗



The mystery of rolling wheels.)

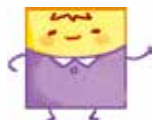
◎ Mathematics course maker space

When you stand by the road and watch the different vehicles pass by, you'll see that even though they look different, are different sizes, and move at different speeds, they all have wheels that can spin. And if you look from the side, all the wheels are round.



Why are all wheels round? Can wheels be triangular?

How about we make a simple triangular wheel out of colored paper?



How can we make a triangular wheel roll on the ground?

try this

Step one: Cut out an equilateral triangle from colored paper.

Step two: Make a hole in the center of the triangle."

Step three: Use a ruler as the ground. Put a pen through the hole in the center of the triangle, and let the pen roll the triangle along the ruler.

Step four: Draw the path that the center of the triangle takes as it rolls on a piece of white paper.



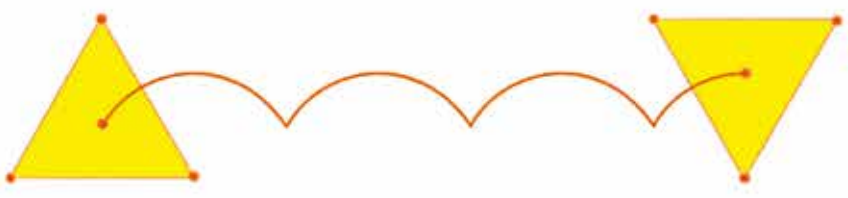
Lets Think: After the triangular wheel rolls, the path drawn by its center is a bumpy, wavy line. What does this tell us?

This shows that a car with triangular wheels would bounce up and down when it drives on flat ground.





Why does the center of a triangular wheel make a wavy line when it rolls?



It's because as the triangular wheel rolls, the distance between the center of the triangle and the ground keeps changing.



Do wheels of other shapes do this too?

Square wheels.



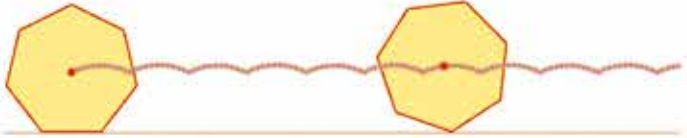
Pentagon wheels.



Hexagon wheels.



Heptagon wheels.



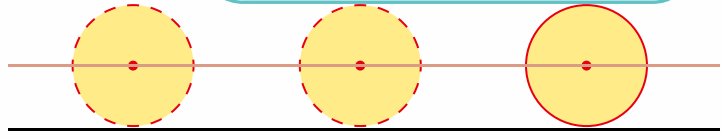
When the wheel rolls, the distance from the center of the wheel to the ground changes. This makes the ride bumpy and not smooth.



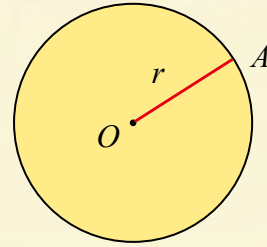
Why doesn't a car with round wheels bump when it drives on flat ground?



When a round wheel rolls, the path of the center is a straight line. Why?

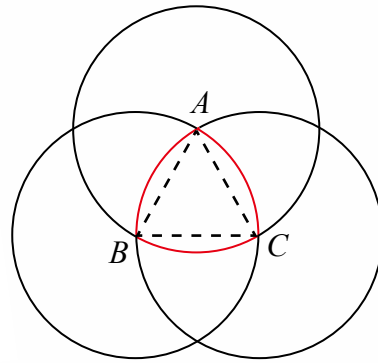


The special thing about a circle is that the distance from the center to any point on the circle is always the same. When a round wheel rolls, the center stays the same distance from the ground, so the ride is very smooth.



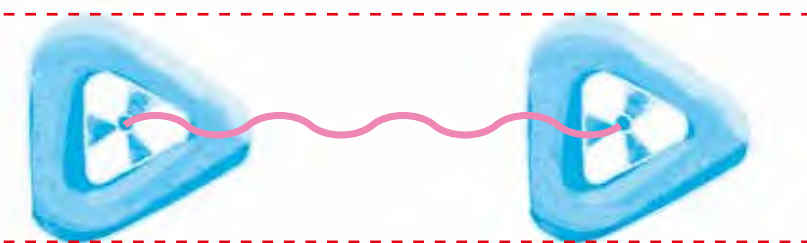
Besides circles, there's another shape that rolls smoothly—it's called the Reuleaux triangle. Do you think the Reuleaux triangle can be used as a wheel? Let's make one and try it out!

First, draw an equilateral triangle ABC. Then, use each corner of the triangle as the center of a circle. Draw arcs with the sides of the triangle as the radius. This will make a Reuleaux triangle!



Did you notice? When the Reuleaux triangle rolls, its center moves up and down, making a wavy path. That's why it's not good as a wheel. But when it rolls on flat ground, the center always stays between two parallel lines. This makes the Reuleaux triangle useful for conveyor belts to move goods!

But in real life, making a Reuleaux triangle is a bit tricky, and the sharp corners wear out easily, so it's not used very often.





fill in the blanks to check what you ' ve learned!

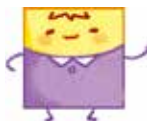


What are the paths of other shaped wheels like?

When polygon wheels roll, the path of the center is _____, because the distance from the center to the ground _____. Using these wheels on flat ground will make the ride bumpy.



Still have questions? Scan the code to watch the mini-lesson!



What shape of wheel is the smoothest?

Round wheel

The path of the wheel's center is a _____, and the distance from the wheel's center to the ground _____. _____ wheels are the smoothest.

In math, we say: The distance from any point on a circle to the center is _____



What did you learn today?

I learned the most about : _____

My biggest question is : _____

