

Working material for the lesson: "How many times the wheel rolls?"

- b) Considering that one Uranus day is the time necessary for the planet to do a complete spinning around its axis which is the link between the number of rotations and the number of Uranus days necessary to cover the orbit?
- c) The planet makes 30800 complete rotations around its axis for covering his orbit around the sun. How long is Uranus orbit?
- 3. A football ball has a diameter of 22 cm.
 - a) Transformate the diameter in m;
 - b) Calculate ball's circumference. What distance the ball will cover on a complete roll?
 - c) If the football field has a length of 100 m how many times, the ball will roll?
- 4. A locomotive wheel has a 1,8 m diameter.
 - a) Calculate wheel's circumference;
 - b) How many times the wheel will spin to cover a distance of 12 000 km ?
- 5. A diesel locomotive wheel produced in Romania has the diameter of 80 cm.
 - a) Transformate the diameter in m;
 - b) Calculate the circumference of the wheel;
 - c) How many times the wheel will roll if the train goes for 1000 km?
- 6. On your desks, there is a circle that simulates a basketball.
 - a) Use the ruler to measure the diameter;
 - b) Measure the length of the desk that you are staying on;
 - c) Count how many times the circle rolls completely on the desk;
 - d) Verify by calculation if you counted right.

Geometry lesson:

Theme: practical application on the geometric shape of circle;

Key words: the circle, the diameter, the circumference, π .

Content form 7 grade core curriculum in Romania.

4-th of February 2020, "Avram Iancu" Gymnasium school

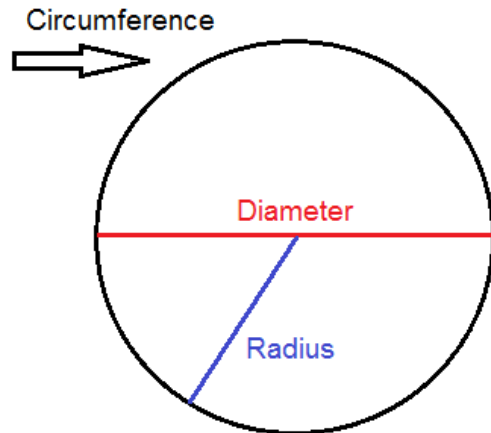
Teacher: Diana Rafa

Working material for the lesson: "How many times the wheel rolls?"

How many times a wheel spins

In order to give answers to that question, we will speak about the circle. By knowing details about the circle we can answer to that question.

As you may know a circle is a geometric shape formed by the points from a plan situated to the same distance from a fix point named the centre of the circle.



To measure a circle's circumference means to wrap a string around it and after that, to put the string on a ruler. During practice we observed that the ratio between the circumference and the diameter is the same value. In fact the value is the famous number $\pi = 3,141592$

According to that observation, the circumference of the circle is $\mathcal{L} = 2 \cdot \pi \cdot R = \pi \cdot D$.

Practical issue:

So if I have a wheel with an diameter of 1,5 m, how many times will it roll in my courtyard from the entrance gate to the garage, considering that the distance between the gate and the garage 10 m.

$$D = 1,5 \text{ m}$$

$$\mathcal{L} = \pi \cdot D = 1,5 \pi = 1,5 \cdot 3,14 = 4,71 \text{ m}$$

The number of rolls:

$$n = \frac{10}{4,71} = 2,12.$$

Answer: the wheel will roll completely 2 times.

Starting from this example your tasks will be:

1. We have a tire with the radius of 65 cm. Starting from those numbers calculate:
 - a) Tire diameter in m;
 - b) The tire circumference;
 - c) How many times a tire spins if the car makes 1500 km.
2. Knowing that the planet Uranus has a leaning angle from the vertical direction of 98° and planet's diameter is 52 000 km, calculate:
 - a) Uranus' circumference;