Balance the Car

Model Number: **YE.316**

Lesson Subjects: Balance, tilt sensor and its mechanical activity.

Accessories: for each kit – a snail transmission and 4 rubber bands.

Objectives:

- The children will become acquainted with the concept of balance.
- The children will become acquainted with the principle on which the tilt sensor is based.

Lesson Plan:

1. Explain the model operation to the children.
2. Algorithm discussion
3. Pseudo code
4. Explain the concept of balance to the children.
5. Explain how a tilt sensor works.
6. Building and programming.
7. If necessary, display the programming screenshot.
8. Improvements.

Balance – Model Operation:

The model built today is divided into two parts: a swing-like device with a vehicle going from side to side – creating a situation simulating a balancing scale.
The vehicle's objective is to maintain the swing balance, while driving to and fro.

Algorithm Discussion:

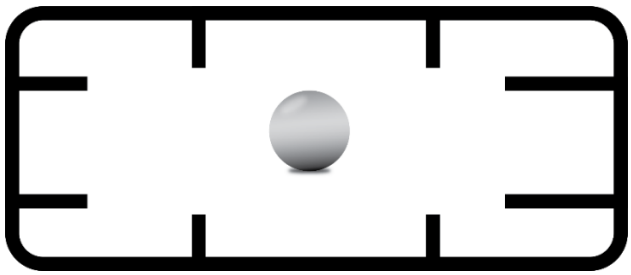
1. Start motor.
   - 1.1. If the tilt sensor recognizes a tilt to the right
     - 1.1.1. Drive vehicle to the left.
   - 1.2. If the tilt sensor recognizes a tilt to the left
     - 1.2.1. Drive vehicle to the right.

Pseudo Code:

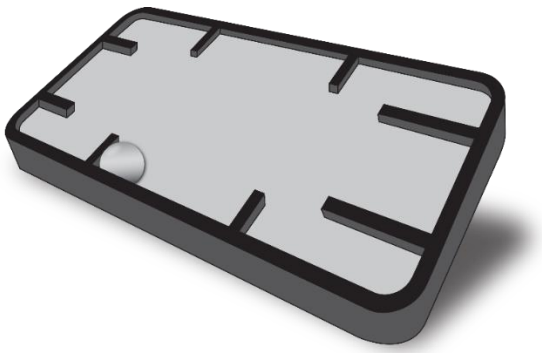
1. Once the car positioned in the middle – start!
2. Loop
   2.1. Move Motor (A,Left).
   2.2. Tilt sensor moves right.
   2.3. Move Motor (A, Right).
   2.4. Tilt sensor moves left.

Tilt Sensor and its Operation:

There are a few ways in which tilt sensors work. Let's focus on one way, in which the tilt sensor that is included in the kit works. Draw on the whiteboard:



Explain to the students that this is what the inside of the tilt sensor looks like.
There is a marble / a ball in the center of the sensor, and as long as the sensor is balanced the marble is in the center and the sensors don't detect it.
When the marble starts moving sideways, the sensors pick it up and send signals about its location in the sensor. This determines the tilt direction of the sensor.
Ask the children what does the sensor transmits now? Where is it tilted to? Answer: Down!



Programming Screenshot:

Instructor Comments:

- Pay attention to the motor calibration and to the sensor direction according to the order of commands.

Improvements:

- You can make the vehicle go faster and make a sound when changing its direction, like in the following command chain: