

### Teachers' Guide

#### Objectives of the lesson

After the activity students will be able to:

- Describe what a robot is and where it is used
- Explain what the hub and the sensor are and how a robot is programmed to do a work
- Understand the effect of air in the airplane's motion
- Use the software to program their construction and explain the blocks they used

After a set of sessions students will:

- Achieve to collaborate and have a role in their group
- Communicate with the members of their group to solve a problem
- Develop their creativity and critical thinking skills to solve a problem
- Develop their fine mobility skills and be able to modify their construction
- Explain the code and modify it to change or improve how their construction works

#### Introduction to the activity

This is the first time students will use the present set, so do an introduction on what a robot is, where it is used, what the words “sensor”, “hub”, and “output” mean, and what an automation is. Lastly, discuss about the special parts of the set (hub, motor, sensors) and explain what they do. You decide whether you give the set to each group or not.

Finally, discuss in brief about the airplanes, and that you will build an airplane that revolves due to the air. Don't waste time in the discussion at that point, move on to the building process.

#### Building

The construction is demanding, but you can complete it during the session.

#### Programming

Open the WeDo software on the tablet and connect each group to the hub through the Bluetooth. Be careful not one group to connect the tablet to another's hub.

If you haven't connected again, open the WeDo software. Under My Projects, press +. On the new screen, you can write the code, by drag and drop the appropriate blocks. To connect, press the button, up and right you see in the next picture. Follow the guidelines: press for a while the green button on the hub, until you see its name below the list Choose Smarthub, that opens in the tablet. Check it and a hand will appear, showing you that you are connected. The hub will have a blue stable color. If the blue light on the hub closes, it means you are disconnected. Follow the same process to connect again.





Explain the code: The green blocks are related to the motor. From left to right, after the play button, you set the power of the motor equal to 10, which is the maximum you can get (if students write a greater number, motor's power will be 10), then move counterclockwise and change colors in the hub button randomly for 70 times, as declared by the dice, and then set the motor off.



You can always stop the program by pressing stop (see next picture), that is down and right.

### Answers to the worksheet

1. The airplane starts revolving with the block you see.  
The first block changes the color of the hub's light and the third rotates the motor towards one direction or the other.
2. When you press on the blocks that shows the direction the motor rotates, you can change it. Also, you can drag and drop the respective block.
3. The magnitude of the power is around 3, depending on the batteries' voltage. For this reason all groups will not find the same number.

