

Multicultural and inclusive education: Your Lesson plan

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Lesson title: Blocked pipes

Lesson brief description

We will work the 6th sustainable development goal (SDG) “Clean water and sanitation” and we will use technology to clean the pipes so we will work the 11th SDG “Sustainable cities and communities” and

In this activity, students are going to clean the city's pipes using a new invention: pipe-cleaning robots. However, due to the accumulated dirt in the pipes, the robots break down and have to be restarted. To do this, the students have to answer questions about safety and the protection of health and well-being.

Time (Lesson duration): 2 sessions

Methodology: (group, individual, peer assessment, brainstorming, etc...)
Groups of 2 students.

Materials needed:

Tablets with this app: Sphero Play
Robots Sphero mini
Markers
Continuous paper

Students' age: 6 years old

Aims/Goals or SWBATs (Students will be able to.....)

- Develop organisational and planning skills.
- Make decisions.
- Sensitivity to environmental and social issue
- Manage the operation of the robots.

Lead-in *What's going to happen here to introduce your students to the topic?* Time: 5 minutes
We explain to the students that we are part of a cleaning patrol and we have to clean some pipes using technology and they will be safe and protected.

What key-concepts could teachers focus on? What needs to be pre-taught? Time _____

The teachers need to have knowledge about:

- SDG
- Sphero Mini app (Sphero Play)

List of activities with brief description of each one and time for each one:

- Pipe maze (20 minutes): Before starting the activity, they are going to create the pipe maze that the students will go through with the robots. It should be big enough for the whole class to stand around it. On continuous paper, we draw a path of pipes in the shape of a maze. It should be made up of straight lines and right angles and the pipes should be at least 10 cm wide. We use some markers to draw 6 "dirt" dots along the route. It is important that we leave free spaces so that the students can decorate and draw on them.
- Cleaning the pipes (30 minutes). We instruct the class to place the robots at the starting point of the pipe maze and explain how the game works. Using the Sphero Mini remote control they have to go through the maze passing all the dirty spots to clean them when they arrive. The poor robots end up full of dirt every time they clean one of these spots. To clean themselves, they need to turn off their electronic parts and pour water on themselves. However, every time they switch back on to get back to work, the robots will send us a question so that they can safely restart.
- Being safe (30 minutes). It's time to start cleaning up! When all the groups reach a dirty spot we ask them a question from about security in the work and we offer two options A and B. When each group is clear about their answer, they write down the letter of their answer next to the dirty spot they are in. Each team can use a different colour. Each group that makes a mistake adds up to a "technical failure". Then each group continues to the next dirty spot. We make sure that the person controlling the robot changes frequently. We can use the questions to get them to change at that time. We can use a whiteboard or a sheet of paper to write down the "technical failures". At the end, the group(s) with the fewest 'technical failures' has won and we thank the groups for helping to keep the city's pipes clean.

What are other follow up (or homework) activities that can be included?

At home they can watch this video.

<https://www.youtube.com/watch?v=ygMEp4bblts>

What methodology / activities are used for assessment?

In order to ensure that our students have achieved the objectives of this activity, we can observe them during the course of the activity and try to see if:

- They answer and reflect on the questions posed.
- They understand the sustainable development goal of Clean Water and Sanitation and Sustainable cities and communities.

Other thoughts about this lesson plan:

They are young students and we try to show them the SDG using activities that motivate them, mixing with robotics, that allows them open their mind to the future.