

Tento projekt je financován Evropskou unií v rámci Národního plánu obnovy.

Tool: Sewer Detective

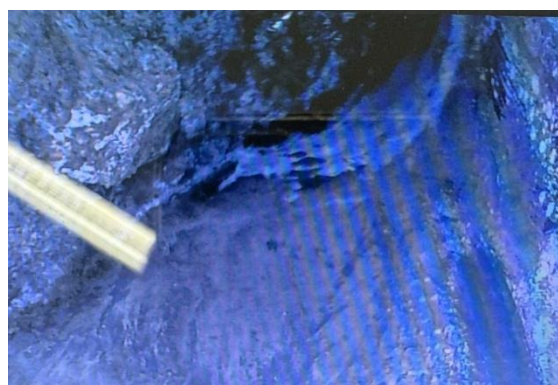
Principle:

This gadget draws you into the world beneath our streets. Imagine that you are the operator of a specialized sewer camera that navigates through an intricate maze of pipes. Move the camera around the sewer model to reveal hidden objects in the pipes. Just like in real life, where the inspection camera plays a key role in sewer maintenance and diagnostics.

The children have the task of using an endoscopic camera to find five things that we don't want in the sewer - concrete, fat, stones, wet wipes and a rat. The obstacles are shown below - on the left you can see the view of the pipes, on the right the image from the camera.

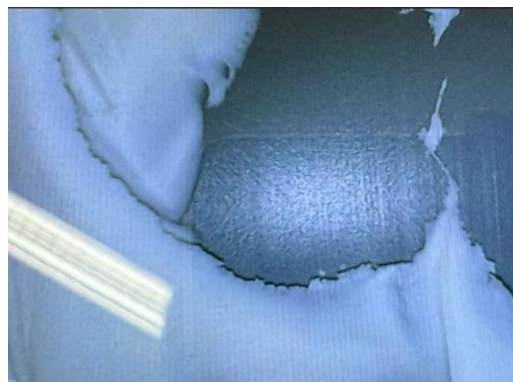
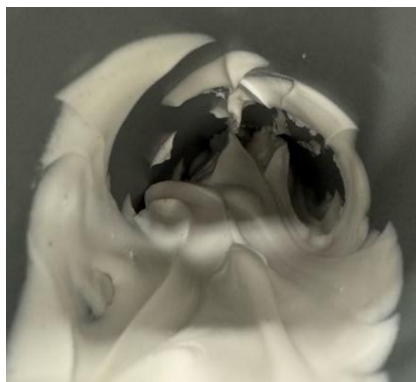
The tool can serve as a learning activity or as a competition. The winner is the one who finds all the obstacles in the shortest time.

Concrete (pipe #11)



Fat (tube #14)

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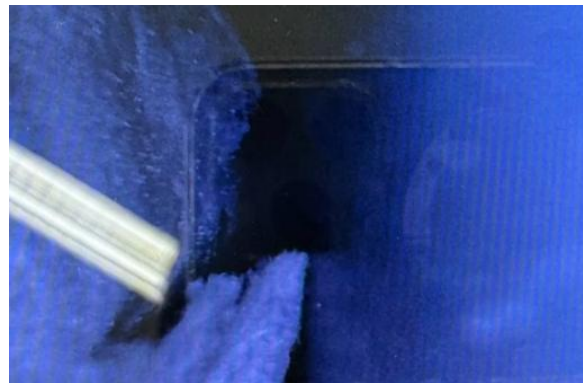


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Stones (Trumpet #12)



Wet wipes (tube #21)



Rat (Trumpet #2)



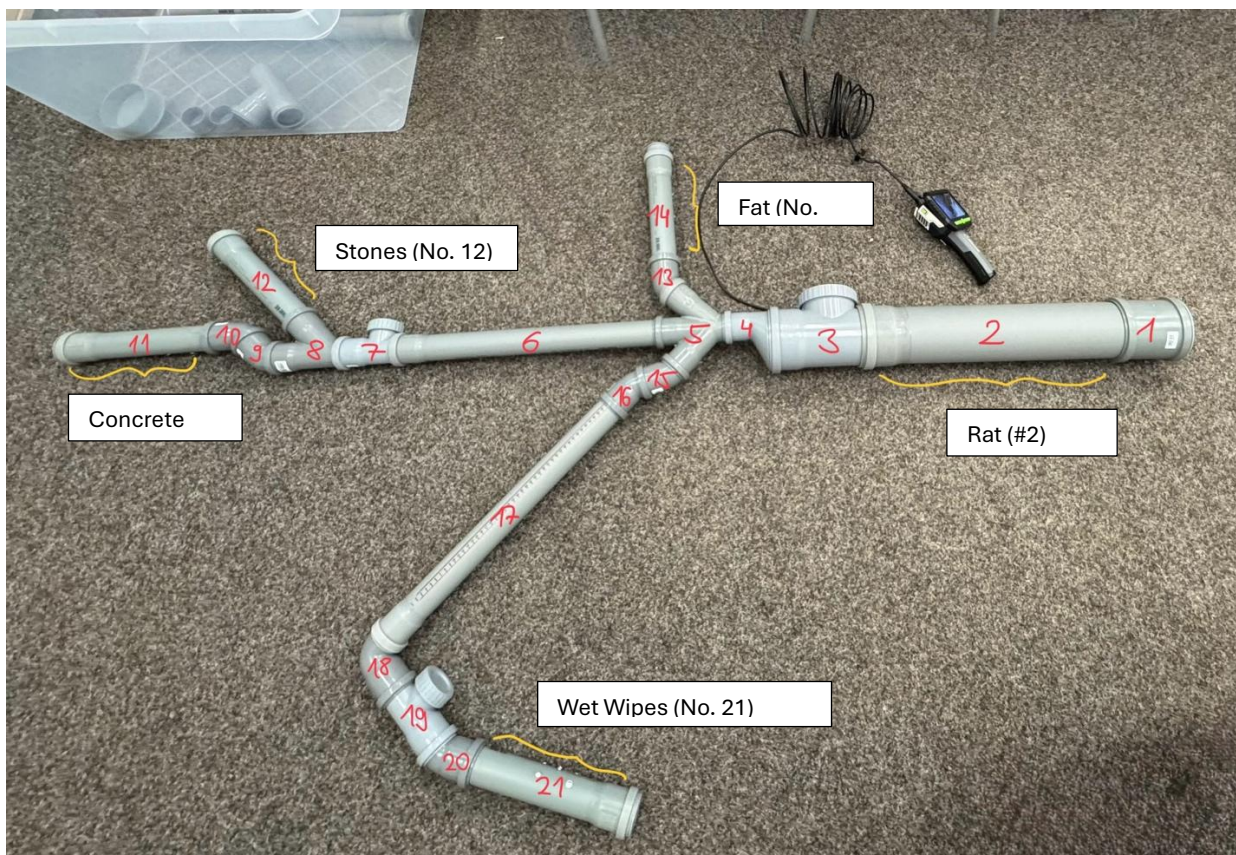
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Preparation:

Preparation time:	Environment:
about 20 minutes	a larger space is ideal, but anywhere is possible

First, it's a good idea to spread out the blanket and build the pipe on it. To connect the pipes, it is necessary to use the enclosed assembly lubricant (it facilitates subsequent disassembly), which is smeared in a thin layer on the edge of one pipe. We slide the greased edge of one tube into the rubberized part of the other tube. The numbered pipes are then connected according to the plan below.

The endoscope cannot turn, so all obstacles must be placed near the entrance inspection holes so that children can direct the endoscope to the desired pipe branch by hand.



Note: The stones are inserted into tube No. 12 separately and care must be taken to prevent them from falling into tube No. 8. If necessary, disconnect the tubes and return the stones back.



Ministerstvo životního prostředí



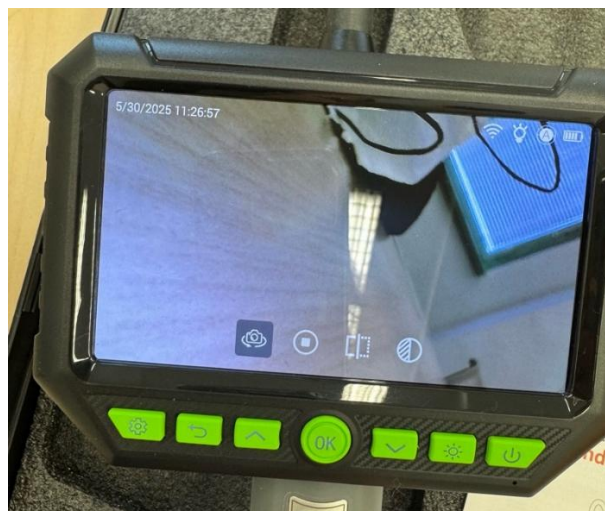
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It is also necessary to prepare the endoscopic camera. It is taken out of the case, assembled according to the enclosed instructions and the camera is checked. At its end, a black ball is attached with insulating tape, which ensures better movement in the pipeline. Before starting, it is necessary to check whether the ball holds and at the same time does not cover the top and side cameras (see photo below).



Note: The view of the camera can be changed using the OK button - the camera icon with an arrow will appear, and then confirmed again with the OK button (photo below).



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Instructions and rules:

Preparation time:	Environment:
it depends on the skill of the children (5-20 minutes)	free research or competition

After assembling the pipe labyrinth, switching on and adjusting the endoscopic camera, the tool is ready. The goal is explained to the children – to find 5 obstacles using the camera. They can carefully bend the wire on which the camera is (sometimes it can get stuck when scrolling in more complex branches). The camera needs to be moved, but it is not advisable to use force. The camera view can be changed for better orientation. It is possible to remove the camera with your hand or to bend it in another way.

Children enter the pipe system with the endoscope only through screw inspection holes (pipe no. 3, 7, 19) - not only for better accessibility, but also because real workers get into the pipe in this way. You can let the children explore just like that, or you can track the time for them to find all the obstacles. For each obstacle not found, a time penalty is added (e.g. + 30 s).

Cleaning:

Cleaning time:
approx. 10 min

After finishing, it is necessary to disconnect all pipes. It is best done on the ground from the outer pipes. It's a good idea to use a little force if necessary, but the lube should make it easy for the most part. It is necessary to use a dry cloth to wipe the remaining lubricant from each pipe. All parts will go back into the box. The stones return to the cup. The stones in the cup, rag and lubricant are stored in a paper bag.

The endoscopic camera and all its parts are returned to the case in their original form - the wire with the camera is disconnected from the part with the display, the cable is coiled and everything is returned to its place.

Finally, everything is checked with the checklist below.

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Checklist:

Check the contents of the box before you start and after you finish.

- Box with lid (74x55x43 cm)
- Case with endoscopic camera
 - Holder with display
 - Cable with camera and ball
 - Spare "droplet"
 - Charging cable
 - Instructions
- 21 different tubes described by number
- Paper bag
 - Assembly grease
 - 3x stone
 - Rag
 - Boxed tissues
 - Adhesive tape
- 4x large spare tubes
- Plastic bag with spare parts
- Charger with cable
- Extension cord
- Power bank
- 1x large mat (2x2m)
- 2x pad small

