

TEMPLATE for BEST PRACTICE EXAMPLES



- 1. Name of the project:**
Make your own camera
- 2. Subjects covered from STEAM areas:**
Science, engineering, art, mathematics
- 3. Target group (age range and size of the group):**
11-16 y.o.
- 4. Duration of the activity:**
1-3 h
- 5. Key words:**
Camera obscura, photography, optics
- 6. Key sentence describing context of the activity, followed by short description (200 words):**
Make your own camera obscura inspired camera and use it to make art. Students make their own simple camera in the spirit of camera obscura. Camera is made of a box to which a lens is attached. The opposite side of the box is removed and replaced with a translucent paper. The image is projected to the paper. Students take a picture from the image with a real camera and the pictures are presented on an arts exhibition.
- 7. Description of the activity environment, including the list of materials and tools needed:**
Activity doesn't require any specific environment, but the students should be able to take the art pictures at different places.

Materials: cardboard boxes for the frame. Spherical cardboard (e.g. toilet paper roll) for the adjustable lens. Lens should have roughly the same focal length as is the box's length. Translucent paper (e.g. greaseproof paper) for the back of the cardboard box. A real working camera (e.g. a camera phone or preferably a system camera with a tripod)
- 8. Step by step, detailed description of the activity, including teaching and learning strategies:**
Students are divided into groups. Teacher teaches the basics of camera obscura and lenses. For the best result the students should also know the basics of focal length and the way a lens forms a picture.
 - 1. Making the camera**
Students make a hole on the side of the cardboard box that is exactly the same size as the spherical cardboard (toilet paper roll). The lens is inserted inside the toilet paper roll

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and the toilet paper roll is inserted on the hole in the cardboard box. You should be able to move the toilet paper roll to move the lens and thus focusing the image. Please note that the camera works also without the toilet paper roll, but you can't focus the image without it. The opposite side of the cardboard box is removed and replaced with the translucent paper (greaseproof paper). The "camera" can be decorated for example to made to look like a real camera.

2. Testing the camera

Students test the camera by pointing it to a bright view. An image should form to the greaseproof paper. Focus the image by moving the toilet paper roll and thus the lens inside the roll.

3. The art making

Students explore the environment to find their subjects for the art pictures and take the pictures with the real camera. Every group/student should take not only one, but as many pictures as they like so that they can choose the best pictures from a set of pictures. It is possible to include basic photography related concepts such as "the rule of thirds" by demanding that at least one picture represents the concept.

4. Teaching

Teacher teaches how the picture is formed on the greaseproof paper, and how the focusing of the picture by moving the lens works. Teacher should adapt the teaching of these concepts to match the level of the students.

5. Art show

Students' images are printed and composed into an art show. It is possible to include photo editing for example to make the images look like they were taken a hundred years ago.

9. Learning objectives/competencies:

Exploring optics applications, learning optics concepts, manufacturing a product, learning photography related concepts, learning basic image manipulation.

10. Evaluation/Assessment guidelines:

Students can be asked to rank the art show pictures and/or the self made cameras.

11. Lessons learned:

It can be tricky to make the camera such that no other light gets inside the camera besides the light passing through the lens. Image is quite dark even with a reasonably sized lens, so taking a picture of the image with the real camera can be tricky.

12. Additional information/Links:

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13. Contact person:

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