

Support videos as supplementary tool to the Physics Learning Units in online mode

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About the Learning Units

Learning Units are educational resources designed with an intent to develop enhanced interest, critical thinking, and clear understanding of science and mathematics concepts in high school students under Vigyan Pratibha project. These Learning Units are well within the school curriculum and yet exposes students to dimensions of science and mathematics beyond the realm of textbooks.

Why the need for support videos?

- Visualize the experimental setup and the intricacies involved in the experiment in Learning Unit.
- Introduce the viewers to Learning Units through short videos.
- Encourage the viewers to explore the Learning Units through support videos.

Support videos for Learning Units: Pinhole camera and Experiment on measuring volumes

Pinhole camera

- A Learning Unit based on pinhole effect, involves students making a simple pinhole camera.



(a)

(a) Pinhole camera made with easily available materials.



(b)

(b) Transparent bottle and marbles used as alternatives for the experiment.

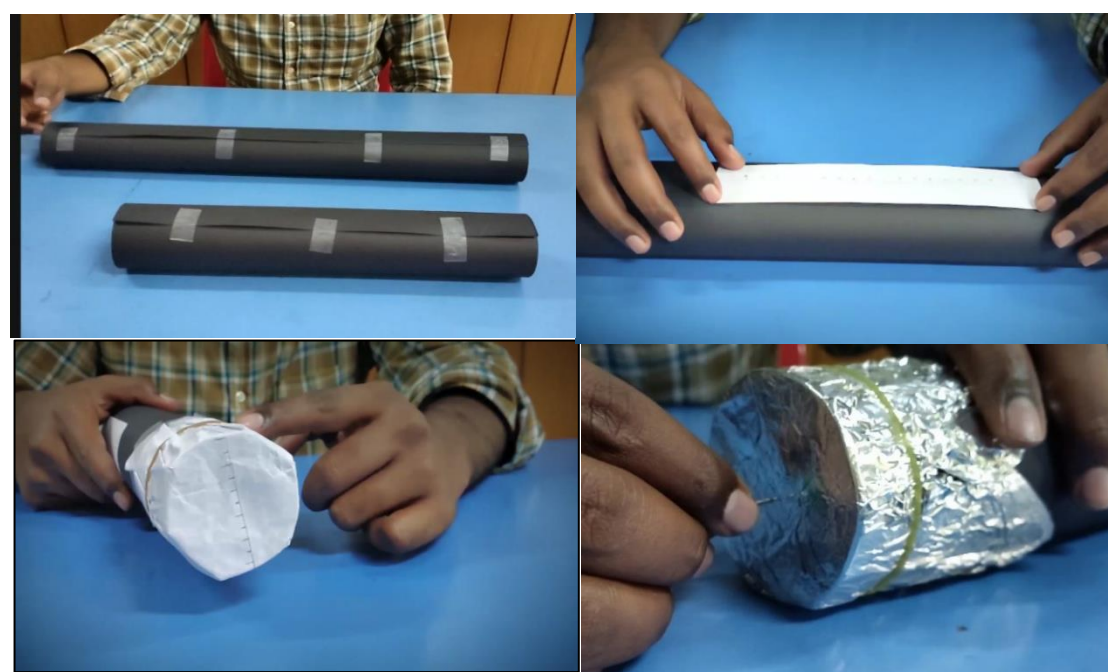
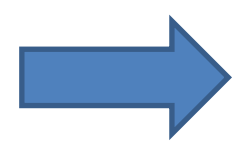
An experiment on measuring volumes

- Learning Unit based on students performing an experiment based on the famous childhood fable “Thirsty crow”.

Features of the support videos

Design and model making

Emphasizes on the construction of Pinhole camera and the process of model making for the experiment on measuring volumes. Both are crucial steps in the Learning Units.



(a)

(a) Pinhole camera designed to measure size of large objects.



(b)

(b) A model made to perform the “Thirsty crow” experiment



(a)

(a) Obstruction in the smooth functioning of the camera.



(b)

(b) Steps to fix the problem shown in the video.

Troubleshooting

Support videos highlight the steps which could introduce error or discrepancy in the construction and the experiment and ways to avoid them.



(a)

(a) Incorrect way to perform the task with the stone partly outside the water.

(b)

(b) To start with larger initial amount of water so that the stone is completely submerged.

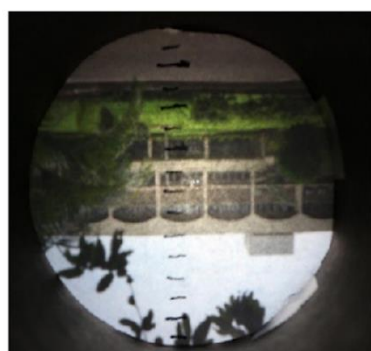


Image in pinhole camera.

What are the salient features of the Image formed on the screen?



➤ Will the crow always be able to drink water from the pitcher?

Cues

The videos contain pop-up questions intended to act as cues to provoke the thought process of the viewer rather than passively watch the video and also generate interest in the topic itself.

Prompt questions in the videos for the viewers

Important features of a support video

Support videos are being developed on Learning Units about physics concepts which need deeper understanding. Facts are introduced in an enquiry based approach, that demands critical thinking by the viewers. The videos help direct the viewers to a more detailed discussion on the topic which is in the Unit.

Conclusions and future work

The project plans many such support videos and intends to work on making more of such support videos for Learning Units for different grades. In future these support videos will be disseminated amongst the teachers and students.

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