

## Lesson Plan

After introducing the pinhole camera to children of different ages we recommend the following steps.

1. Introduce the concept of cameras and ask children to relate their experiences with a camera and the resulting pictures.
2. Explain the different parts of the assembled camera obscura. Explain the pinhole, the big black box, the screen and draw similarities with a normal camera.
3. Give each child a sheet of paper and take two children at a time into the obscura. Ask them to face their back to the pinhole and hold the sheet up in front of them. Let them adjust the white paper till they see an image on the paper. If they can't see an image adjust the sheet for them.
4. Take the children outside the viewer and show them the object they were viewing from inside the obscura. Ask them leading questions till they realize the image was upside down.
5. Teach the children to build their own pinhole cameras using toilet paper rolls.
6. Draw similarities with the obscura. For example the tubes and black paper are like the black box. The wax paper is like the screen and so on.
7. Cut out a black arrow and tape to the window. Ask the children to look at the arrow through their cameras and remember what they saw
8. Hand them the worksheet, follow the instructions provided and ask them to draw their observations.
9. Give a brief explanation about why the images were upside down and how light travels in a straight.
10. To further clarify it, light a candle, place a black piece of paper (approximately 6" by 6") in front of it. Place a piece of cardboard slight smaller in size between the candle and the black paper. There will be no light from the candle on the black paper. This is because light cannot travel in curves around the cardboard and reach the black paper. Now pierce a hole in the cardboard. You should see light on the black paper. This is because light travels in a straight line through the hole and reaches the black paper.

By the end of the lesson children should learn the concept that light travels in a straight line.

Note: The activity works best in bright sunlight and can even be taken outdoors.