Einstein Alive

P2-6000

INSTRUCTIONAL GUIDE

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- Einstein Alive
- Instructional Guide

Required for Activity

- Light source

Background

Humans are used to seeing convex objects (like faces) lit from above. The sun, lamps, and most types of room lighting provide overhead illumination that produces certain patterns of shadows on a face. (Think about the eerie effect produced by lighting one's face from below with a flashlight.)

Lighting the concave mask from below produces the same shadow effect as lighting a convex face from above. Our expectations add to the illusion. We are accustomed to seeing convex faces rather than concave, so the familiar pattern of light and dark is enough to fool our eyes.

When you move back and forth, the face seems to turn and follow you. This is caused by parallax and perception. Objects that are farther away seem to move less as you move past them (parallax). Einstein's nose is the farthest away from you and seems to move the least. That would seem to indicate that the face is concave. However, since the shadows cause the face to seem to be convex, it appears that the face is turning to follow you instead, keeping the nose (and other distant parts of the mask) pointing in your direction.

Set-Up

1. Place the mask on a surface so that the viewer sees the concave side (as if they were going to put their face in it like a mask).
2. Put a light source, such as a small light bulb or desk lamp, behind the mask and lower than its center. Viewers should not be able to see the light bulb from where they are.
3. View the mask from several feet away and move back and forth. Einstein should appear to turn his head and follow you. Move up and down, and he will nod his head.
4. If you don't see the illusion at first, try viewing the mask with only one eye.

Related Products

Miracle Mirror (92-7170) The Miracle Mirror is a plastic hemisphere that is coated with aluminum to create a concave mirror on the inside and a convex mirror on the outside, permitting a variety of fascinating experiments on the differences between the two types of reflecting surfaces.

3D Mirascope Illusion Maker (P2-7040) Parabolic mirrors create a floating holographic image that looks 100% real, but try to touch it and your fingers go right through! Create a hologram with any small object.

Acknowledgement

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