Take a 3D Group Photo!

Subject Area(s) physics, science and technology

Associated Unit

Associated Lesson

Activity Title Take a 3D Group Photo!

Header

Image 1 **ADA Description: ___?** **Caption: ___?** **Image file: ___?** **Source/Rights:** Copyright © ___?

Grade Level 5 (K-12)

Activity Dependency

Time Required 30-45 minutes

Group Size

Expendable Cost per Group

Summary

Students learn the concept of 3-dimensional images and how two identical images can form an anaglyphic image to create an illusion of depth.

Engineering Connection

This activity requires the use of a camera by which the facilitator will take two identical photographs from two different angles, roughly 65mm apart. These two photographs will then be computer processed to form an anaglyph image. This process mimics the way the human eyes takes two separate images and create one image.

Engineering Category = #1

Choose the category that best describes this activity's amount/depth of engineering content:
1. Relating science and/or math concept(s) to engineering
2. Engineering analysis or partial design
3. Engineering design process

Keywords

Anaglyph, 3D,

Educational Standards

Arizona, science 2004, grades k-5

Strand 3: Science in personal and social perspectives, Concept 2: science and technology in society, PO 5: Describe important technological contributions of people's lives (e.g. entertainment, medicine, transportation, communication)

Pre-Requisite Knowledge
Understand basic visual 3D principles and how they are used in society, such as the entertainment industry.

After this activity, students should be able to:
- Explain how the human eye forms one image using two separate images
- Explain how 3D images use two images to create a single image with depth perception.

Each group needs:
- red & cyan 3D glasses
- digital camera
- Tripod (optional)
- anaglyph software (free download at stereoeye.jp/software/index_e.html)

To share with the entire class:
- digital camera
- Tripod (optional)
- anaglyph software (free download at stereoeye.jp/software/index_e.html)
- Computer or one computer per group

How many have ever seen a 3D image? Where? What makes 3D different than 2D? 3D imagery creates the illusion of depth. As more and more applications and the demand for 3D imagery increases, society will see 3D applications on everyday life. For example, we already have 3D phones, televisions, movies, and digital cameras.

Vocabulary / Definitions

Word	Definition
Anaglyph	An image made to provide a stereoscopic 3D effect
Depth	How the brain interprets proximity of images in space

Background
Teacher must have a basic understanding of how 3D images create the perception of depth.

Before the Activity
- Introduce 3D concept, explain to the students that they will be taking a 3D group picture. In the near future cameras will be able commercial cameras will be able to shoot and film in 3D. You will need to find an ideal spot to take pictures, preferably a place with a stationary object such as a desk

With the Students
1. Have the students assemble for a group picture (or you can have students bring their own cameras and they can work in small groups, in which case they can take their own individual pictures).
2. The camera operator will take two shots. During the period from the first shot to the second shot, the group must remain very still.

3. It is highly recommended that the camera be placed on a stationary object such as a desk or a tripod.
4. Snap the first shot, remind the group to remain very still.
5. Move the camera 65mm-70mm to the left (you do not need to change the angle or height of the camera)
6. Snap the second picture.
7. Load the pictures into the free downloaded anaglyph software (see materials list). The directions are very simple to follow. Just upload the first picture into the right-side image box, and the upload the second picture into the left-hand image box (this process is similar to sending an attachment via email, you simply find and upload the two images).
8. Click "continue" and the software program will automatically create an anaglyph image.
9. Have students put on the 3D glasses to see the image in 3D!

Image Insert Image # or Figure # here, [note position: left justified, centered or right justified]

Figure 1
ADA Description: ___?
Caption: Figure 1: ___?
Image file: ___?
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Attachments

Safety Issues
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Troubleshooting Tips

Investigating Questions
Can we make our own 3D image?

<mark>Assessment</mark>

Pre-Activity Assessment
Descriptive Title: Make an inference of whether or not it is possible to create our own 3D image. Ask the question; is it possible for us to create our own 3D image? How? Ask students to discuss with their partners or groups the answer to this question.

Activity Embedded Assessment
Descriptive Title: Have student copy notes what a 3D image is and the procedure for creating our own.

Post-Activity Assessment
Descriptive Title: Have students create their own 3D images to share with the class!

Activity Extensions

Activity Scaling
• For lower grades, ___?
• For upper grades, ___?

Additional Multimedia Support

References

Other

Redirect URL

Contributors

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<mark>Supporting Program</mark>
CIAN, NSF, University of Arizona: College of Optical Sciences, Meredith Kupinski, Trin Riojas, Kevin ____