Unit 3: Light and Optical Systems *End of Unit Project*

You must choose 1 of these

You will do the project **alone**, or with a **partner,** depending on the chosen project

Description of Project Goals

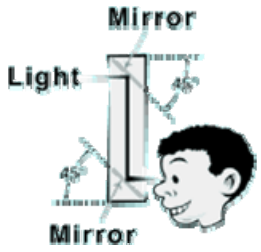
1. To design and construct a working model (prototype) of a **Periscope**
2. To design and construct a **Stadium Image Device**
3. To design and construct a model (prototype) of a **Pinhoile Camera**

http://www.opticalres.com/kidoptx.html

Background:

Periscope
(Alone)

To construct a Model Periscope



http://www.exploratorium.edu/science_explorer/periscope.html

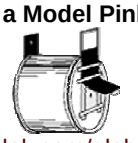
Stadium Image Device
(Alone or /w partner)

To construct a Stadium Image Device

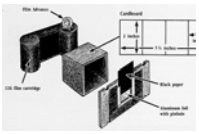
http://www.museumofhoaxes.com/pranks/rosebowl.html

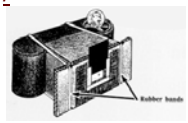
Pinhole Camera
(Alone)

To construct a Model Pinhole Camera



http://www.kodak.com/global/en/consumer/education/lessonPlans/pinholeCamera/





http://www.exploratorium.edu/light_walk/camera_todo.html

Specifications:

Periscope

Prototype must be a working model periscope that can view (identify) 5 objects over a 2.5 metre wall. You must be able to view at least 3 of the objects successfully to pass the ***'working' model test***.

Materials: You may use any materials that will help to create the model – however no commercially developed kits can be used. You should have 2 plane mirrors that are large enough to see objects 20 metres away. Bonus marks will be given if you can adjust the mirrors as you view objects over the wall. **No Size Restriction**.

Project Report is required and should include the following:

- Detailed blueprint (to scale) of the device
- *Construction Details – How did you build it?*
- Troubleshooting – What problems did you encounter and how did you solve them?

Stadium Image Device

Prototype must be a working model of a stadium image with solid colored squares that are $10cm^2$ or $5\ cm^2$ cubes that can be changed at least 3 times, showing a different image each time.

Materials: You may use paper or cardboard.

Size Restriction: No larger than 1 metre square. Minimum size must include 100 squares. Maximum size to include 400 squares.

Presentation should include:

- *Construction Details – How did you build it?*
- Troubleshooting – What problems did you encounter and how did you solve them?
- Project **Report** is **NOT** Required.

Model Test: Successfully creating 3 distinct stadium images using only colored squares.

Pinhole Camera

Prototype must be a working model of a pinhole camera – w/ photos taken by the camera to be presented along with the actual model.

Materials: Whatever you choose to build your camera is up to you, however, no commercially available kits will be allowed.

Size Restriction: No size restriction.

Project Report is required (no longer than 5 pages – including photos) and should include the following:

- Detailed blueprint (to scale) of the device
- *Construction Details – How did you build it?*
- Troubleshooting – What problems did you encounter and how did you solve them?
- Photos taken with the pinhole camera

Evaluation:

Model 50%

(Your working model should successfully pass the test designated for that choice)

Presentation: 50%

Self-Evaluation	Peer Evaluation	Teacher Evaluation (Written Work)
15%	**10%**	**25%**