Summative Optics Challenge
"I Can See Clearly Now" – 3D Show & Tell

Due Date: _____

Topic: _____

Student(s): _____

_____

We know that light travels in straight lines from a source. We have learned that it can be transmitted, reflected, or refracted when it encounters various media. Based upon the study of light, optical devices have been developed which make use of the properties of light. These devices are used to perform or enhance functions that the eye is not capable of performing.

There are also a number of optical conditions that occur in the general population. We have used both lenses and surgery to correct these conditions and improve the overall quality of life.

Your Assignment: ***(check off each task as they are completed to ensure nothing is missed)***

- ☐ Create an open, labeled 3-D model of the device or condition (do ***not*** include descriptions on the model)
- ☐ Include a representation of the path a light ray will travel from where it enters the device to where it leaves or is captured on film (for example, use string, yarn, wire, or ribbon as light rays)
- ☐ Somewhere on the model, indicate the names of all partners and the name of the device or condition
- ☐ Prepare and provide a small cross-sectional diagram (including light ray path) and a brief explanation of the device to the teacher and each student in the class
- ☐ Include a minimum of three references on the back of the model
- ☐ All members of the group will present their device in a 3-5 minute 'Show & Tell'. ***No Multimedia!***
- ☐ Make sure you distribute tasks to all members evenly as much of the grading is shared; if there are problems with a team member, please see the teacher.

You will have a **maximum of 2 class periods** to research, plan, and construct your device. You may take advantage of lunch time extra help sessions to get together with your group and assemble your project and practice your presentation. Otherwise you are to work with your partners outside of class time.

If a member of your group is missing on the day of the presentation (_____) without notifying the teacher ahead of time, the group must be prepared to proceed without them. The missing member will present the project in its entirety to the teacher after school on a designated day late in March or April.

The project will be marked using the rubric on the back of this sheet.

Do not wait until the last minute to get started……

I Can See Clearly Now - 3D Show & Tell Rubric

Knowledge and Understanding				
Criteria	**Level 1**	**Level 2**	**Level 3**	**Level 4**
Model is clear, accurate, and complete	model is unclear; content is missing, incorrect, or irrelevant; incomplete portions	model is somewhat unclear; content is partially correct and/or incomplete;	model is sufficiently obvious, all content is included and correct	model is an accurate, complete, and educational representation of the device
Subject knowledge (Answering questions)	student has little to no grasp of the information; cannot answer questions	student is not comfortable with the information; answers questions without proper terminology	student is at ease answering questions but fails to elaborate	student demonstrates a full understanding of the device and is comfortable answering questions
Preparation/Neatness	model is 'thrown together' with little forethought and attention to detail	some advanced preparation and thought is apparent	model shows thought and attention to detail	model is thoughtfully planned and constructed with full attention to detail
Cross-sectional diagram	poorly done - not understandable	diagram is reasonably complete but content somewhat unclear	diagram is complete and accurately portrays the device	the diagram is complete, accurate, and enhanced by the use of colour
Communication				
Timing	well below/above allotted time	below allotted time or uses time ineffectively	uses allowed time somewhat effectively	within the time limit and uses time effectively
Organization	no sensible sequence of information	some sequence apparent but repetitive	a logical sequence is followed with no repetition except for emphasis	presentation is logical and interesting
Originality	model is copied from another source	some attempt at originality is evident	original ideas obvious	Wow! Never been seen before!
Visual Presentation	student never refers to the model during presentation	student rarely refers to the model	student constantly refers to the model while explaining the device	student constantly refers to the model to explain, support, and reinforce the information
Eye Contact	No eye contact, all reading from notes	Some eye contact, more reading	Good eye contact, but needs to refer to notes on occasion	Consistent eye contact with no reference to notes
Vocabulary	Terminology? What's that?	Some proper terminology used	Proper terminology used consistently and usually correctly	Proper terminology used consistently and correctly
References	What are references?	Less than 3 references are provided and/or the references are not in the appropriate format or are irrelevant to the material	appropriate references are provided, but are not all academically relevant	appropriate, academic references are provided and formatted properly

SNC 2D
Summative Task TOPICS : Light and Optics

1. Vision
   - Eye glasses
   - Contact lenses
   - Infrared vision sensors
   - Anti-glare night vision glasses
   - Laser eye surgery
   - Glasses with coloured filters
   - Corneal transplants
   - Colour blindness
   - Human Vision / Eyeball
   - 3D Glasses & Movies

2. Technological Device
   - Microscope
   - Retro-reflector
   - Solar oven
   - Camera
   - Telescope
   - Binoculars
   - Fibre optics
   - Photonics and cancer
   - Blue light on Smartphones
   - Grocery store scanners
   - Solar technology and space travel
   - Retinal Scanners for security purposes
   - X-rays (doctor or airport security)
   - Sunscreen/sunblock
   - TV technology
   - Fibre optic cable
   - Hubble telescope

3. Optics in Nature
   - Rainbows
   - Apparent depth in pools
   - Mirages
   - Solar eclipse
   - Lunar eclipse
   - Vision in certain insects and/or other species

4. Choice approved by teacher:
   _____

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