Waves Test Part A: 4/19

Topics:

* Wave Properties
* Electromagnetic Waves
* Light (Eye)

**Directions: Students will have 1 to 2 days in class to work on the project. All work needs to be completed individually. Anything not completed in class needs to be completed at home.**

**ALL PRESENTATIONS SHOULD BE 4-6 MINUTES LONG!!!**

1st option: Paper Slide Video OR Powerpoint - 100 Points each

* Covers all 3 topics
* Has at least 10 slides (**20 points**)and 5 pictures (**2 points each**) (can be hand drawn) (**30 points total**)
* Must include a diagram of the eye (**10 points**) AND diagram of the wave (**10 points**)
* Vocabulary to be defined: wave, amplitude, frequency, wavelength, trough, crest, transverse wave, longitudinal wave, line of origin, mechanical wave, electromagnetic wave, vacuum, absorb, reflect, refract, scatter, transparent, translucent, opaque, concave, convex, pupil, retina, lens, cornea (**2 points each-50 total**)

2nd option: 3-D Model of the Human Eye AND a Visible Light Wave

* Model of the eye must have the following parts labeled: iris, cornea, pupil, lens, sclera, orbital muscles, optic nerve, vitreous humor, aqueous humor, retina, (**20 points**)
* Model of the wave must have the following labeled: Transverse wave, crest, trough, amplitude, wave height, wave length, line of origin, volume, medium, pitch (**20 points**)
* Answer the following questions/prompts during presentation: (**10 points each, 60 total**)
  + Explain the process of seeing, from light source to brain.
  + Explain how a change in volume would change how your wave looks.
  + Explain how a change in pitch would change how your wave looks.
  + Would this wave travel through outer space? Why or why not?
  + What is the difference between a human eye and a cow eye? Why is this difference important for animals?
  + Compare and contrast a light wave with a different type of wave. (example: sound wave, ocean wave, seismic, etc.)

3rd option: Complete study guide and take test

\*\*IF PROJECT IS NOT READY TO PRESENT THE DAY OF THE TEST, STUDENTS WILL TAKE THE TEST. **NO EXCEPTIONS!**\*\*

**Directions: Students will have 1 to 2 days in class to work on the project. All work needs to be completed individually. Anything not completed in class needs to be completed at home. Students must choose 1 project from the Heat options and 1 project from the Sound and the Ear options.**

**Heat (50 points)**

1st option: Tour of Heat Transfer in Your House Video

* Act like a reporter, upload video to Google Classroom
* **10 points**: Video is between 4-6 minutes & student is shown in the video, sound is clear- student is easy to understand
* Find and explain 3 examples of each: convection, conduction, radiation, conductor, insulator (15 examples total- **15 points )**
* Define the vocabulary: convection, conduction, radiation, insulator, conductor (**5 points each, 25 total**)

2nd option: Heat Transfer Brochure

* Tri-fold brochure or poster- one section for convection, conduction, radiation, conductor, insulator
  + **10 points**: Presentation is between 4-6 minutes, student does not have to read from notes/note cards, student is easy to understand
* Draw and explain 3 examples of each: convection, conduction, radiation, conductor, insulator (15 examples total- **15 points**)
* Define the vocabulary: convection, conduction, radiation, insulator, conductor (**5 points each, 25 total**)

**Sound and the Ear (50 points)**

1st option: Create an instrument (w/ poster to explain the waves produced)

* Play a “song” on their instrument in front of the class.
  + **6 points:** presentation is between 4-6 minutes, instrument works & is loud enough to hear, poster is neat & organized
* Talk about the sound made- high or low pitch [wavelength]? High or low volume [amplitude]? (**5 points each, 10 total)**
* Have a poster to explain the sound produced and label the following parts: longitudinal wave, compression, rarefaction, amplitude and wavelength (**4 points each, 20 total)**
* Must include diagram of the ear on the poster with following parts labeled: stirrup, pinna, ear canal, eardrum, cochlea, auditory nerve (**2 points each, 14 total**)

2nd option: 3-D Model of the Ear AND a Sound Wave

* Presentation:
  + **6 points:** presentation is between 4-6 minutes, student is easy to understand, student does not have to read from notes/note cards
* Must have a diagram of the ear with the following parts of the labeled: Hammer, Stirrup, pinna, ear canal, eardrum, cochlea, auditory nerve (**2 points each- 14 total**)
* Must have the following parts of a wave labeled: longitudinal wave, compression, rarefaction, wavelength, amplitude (**4 points each- 20 total**)
* Must answer the following questions on a sheet of paper: (**5 points each, 10 total**)

1. Does your model of the wave have a high or low pitch (wavelength)?
2. Does your model of the wave have a high or low volume (amplitude)?

5th option- Complete study guide and take test