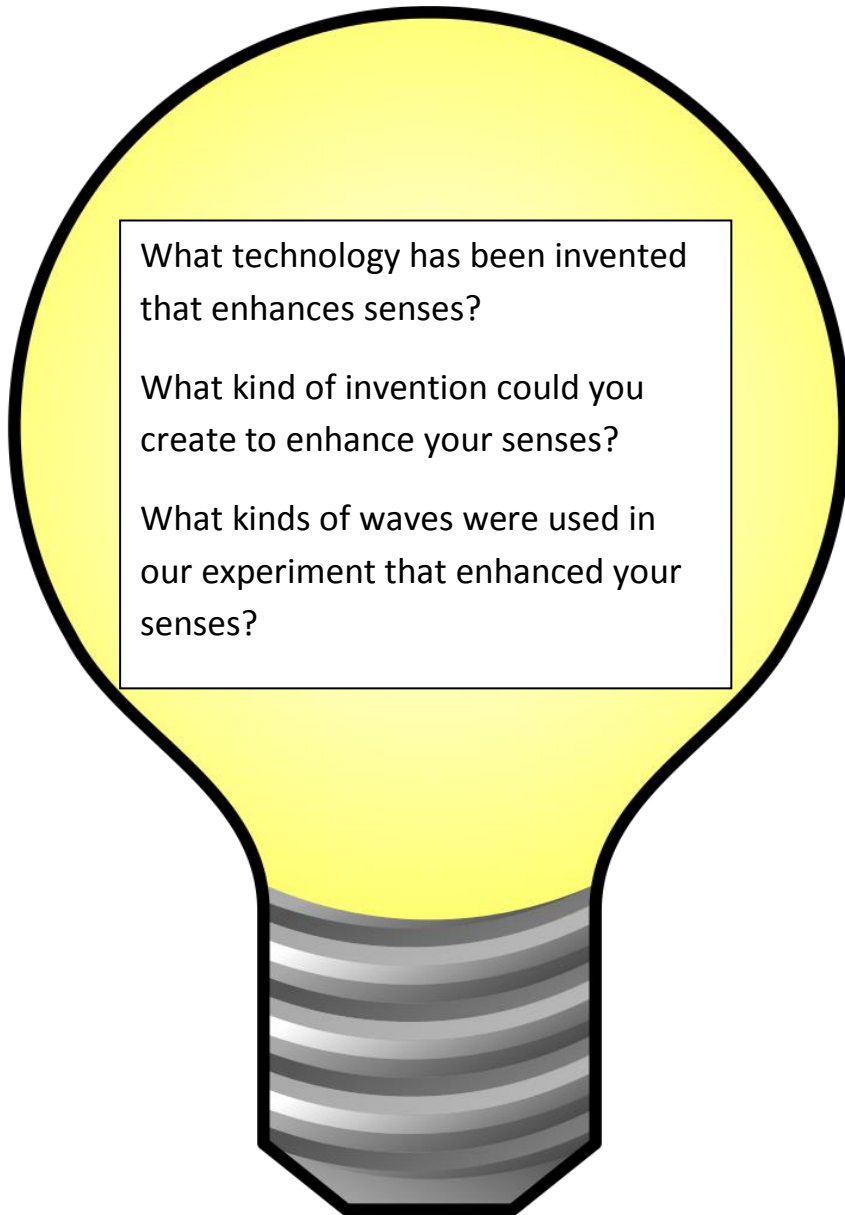


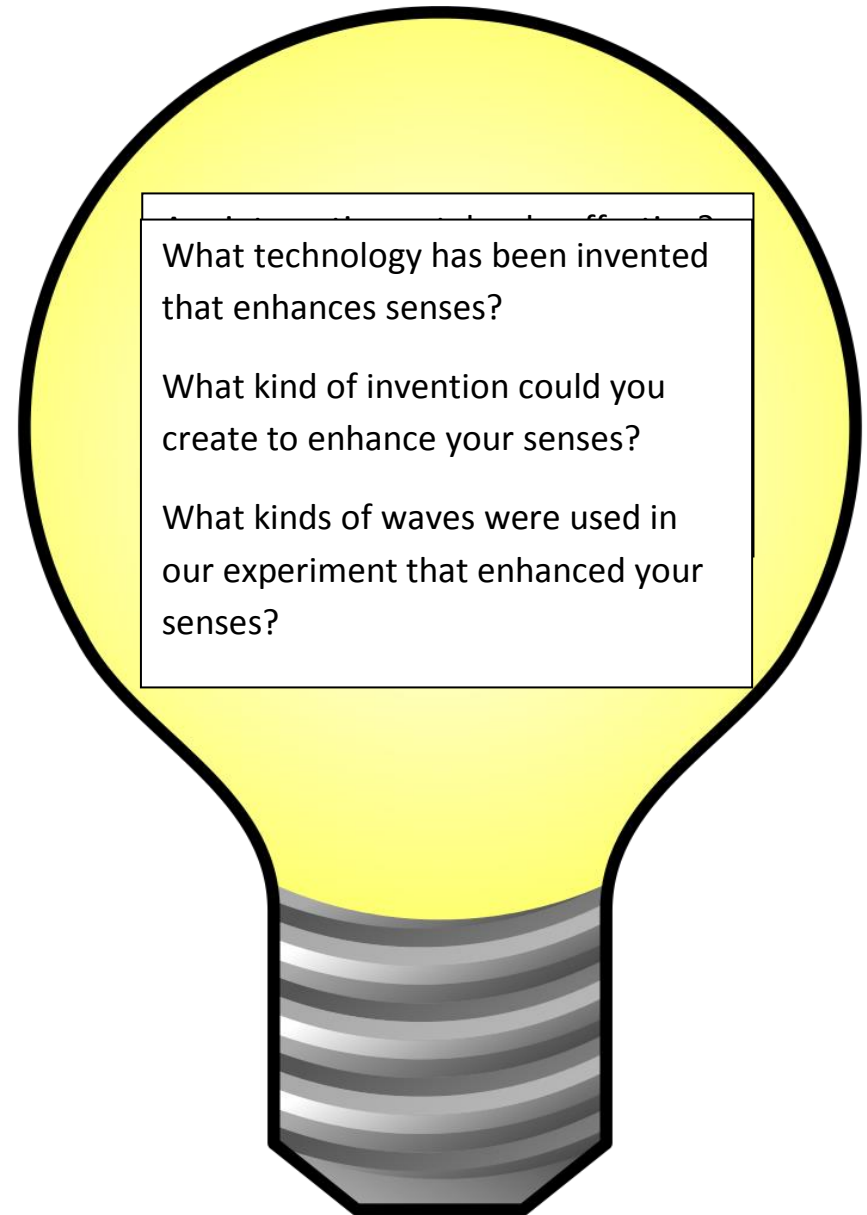
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**Overarching Question:** How does technology use waves to enhance student senses?



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**Line of Evidence – Inventions**

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**Line of Evidence – inventions and Senses**

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**Line of Evidence – Informational Text**

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**Line of Evidence – String Phone Experiment**

*Different variables create different waves, giving us different pitches. When the pitch is the most clear, we can hear the best. We discovered that a long twine string with a foam cup created the best string phone. We selected these through trial and error by doing the experiment with different materials.*

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**Big Aha Thesis Statement**

*Technology creates waves that are more perfect than humans could, enhancing our senses.*

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## Engage – Invention

### ENGAGE

Thomas Edison had over 1,000 patents for his inventions. He was a practical inventor who thought of ways to create new machines that people could use in their daily lives.

Your task :

What new electrical device or machine could you invent that would make people's lives easier and more efficient? Make sure it is something that would enhance their senses. Sketch your idea on paper. Label it. Write a short paragraph to describe the invention and why it is important.

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## Explore – Invention

### **EXPLORE**

#### **INVENTIONS AND SENSES**

**USE YOUR FLIP CHART TO FILL OUT THE FIRST PART OF THE WORKSHEET.**

**Inventors and Inventions:**

<i><u>Inventor</u></i>	<i><u>Invention</u></i>
Thomas Edison	
Alexander Graham Bell	
Nicholas Krebs	
Galileo	
Leeuwenhoek	

**What sense do these inventions enhance?**

<i><u>Invention</u></i>	<i><u>Sense</u></i>
telephone	
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Spectacles	
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What kinds of waves do all of these inventions use?

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What kinds of waves do all of these inventions use?

### **Invention CER**

**Claim** (Write a sentence about inventions that enhance your senses.)

**Evidence** (Provide names and descriptions of the different inventions that have been created and how they use waves to enhance your senses.)

**Reasoning** (Explain how your evidence supports your claim. Describe how the waves enhance your senses.)

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## ANSWER KEY Invention CER

**Claim** (Write a sentence about inventions that enhance your senses.)

*Many different inventions like the telescope and telephone enhance our senses to see and hear better.*

**Evidence** (Provide names and descriptions of the different inventions that have been created and how they use waves to enhance your senses.)

*There are a lot of different inventions that enhance our senses. The telephone and phonograph use mechanical waves to create a clear pitch for us to hear. Other inventions like spectacles, the telescope and microscope use electromagnetic waves to create clear images that our eyes would not pick up themselves.*

**Reasoning** (Explain how your evidence supports your claim. Describe how the waves enhance your senses.)

*The different inventions use electromagnetic and mechanical waves to enhance our senses and make it easier for use to hear and see.*

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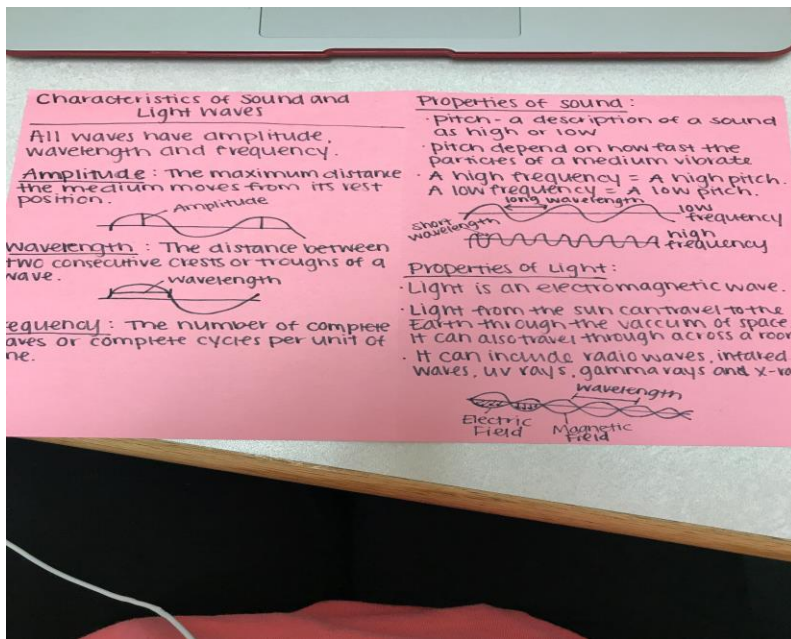
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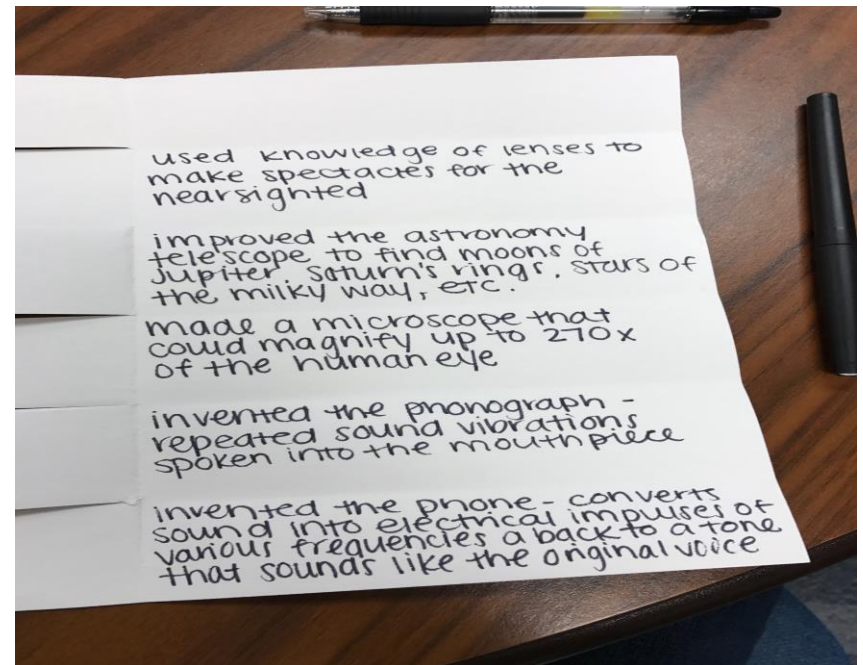
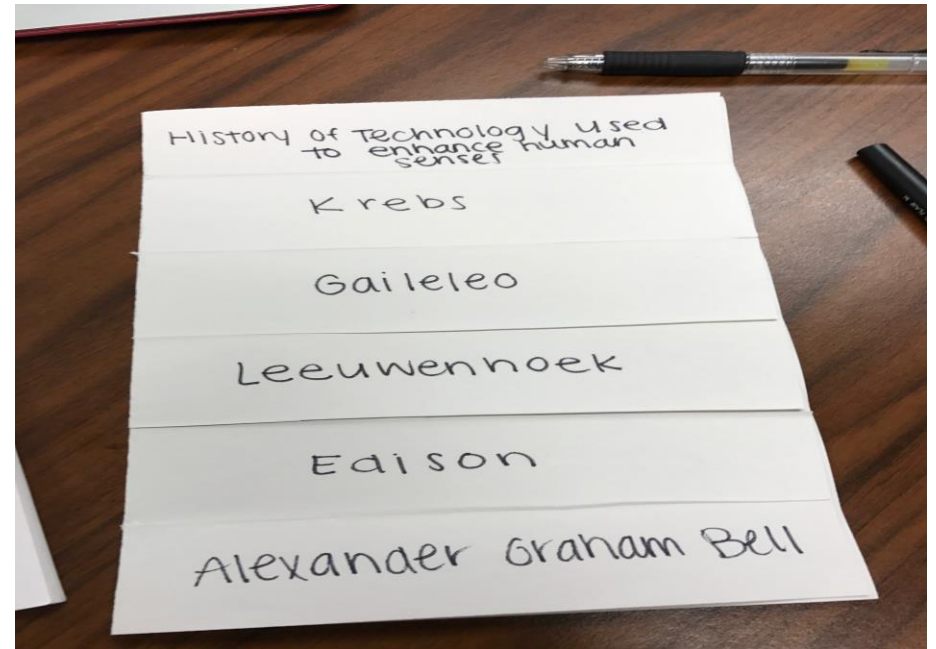


## Explain - Informational Texts

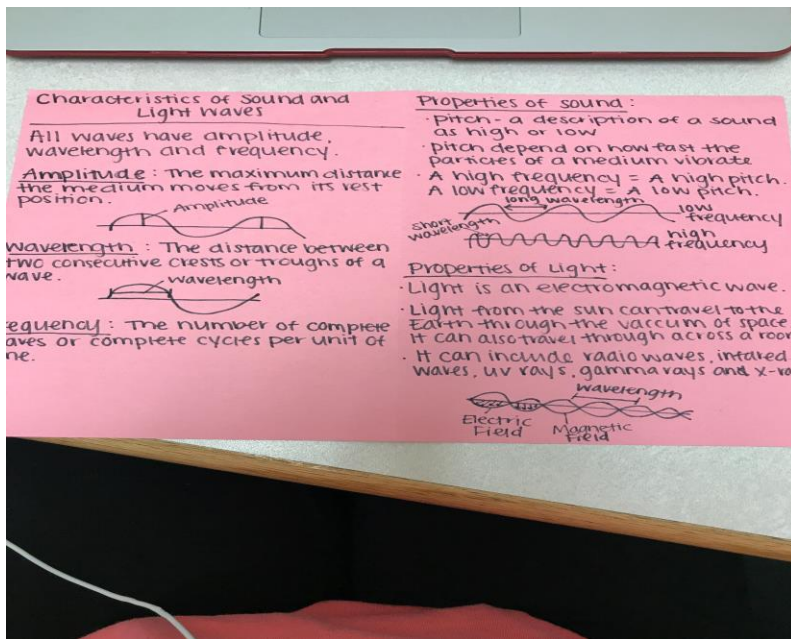


(n.d.). Retrieved April 25, 2017, from <http://faculty.cord.edu/manning/physics215/studentpages/angieevanson.html>

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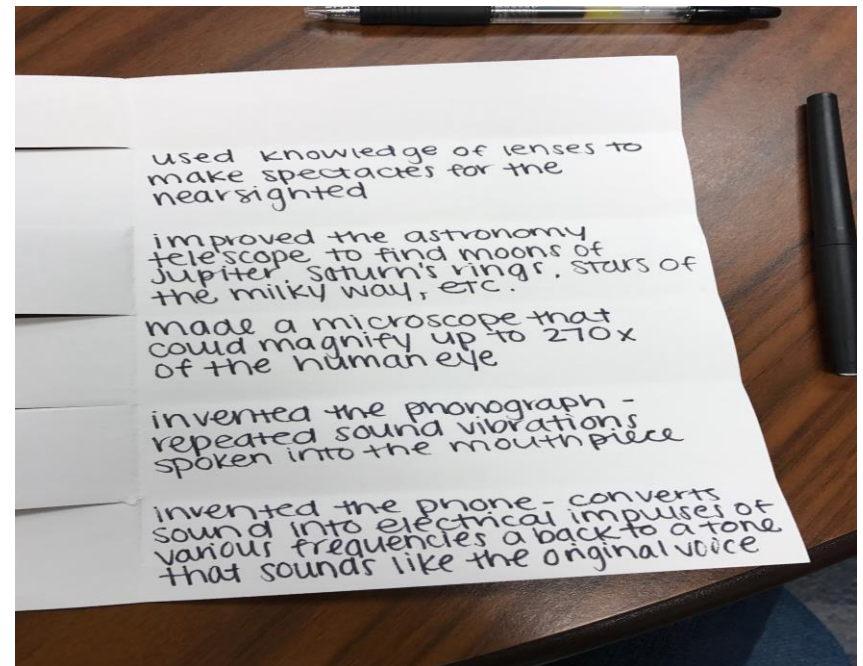
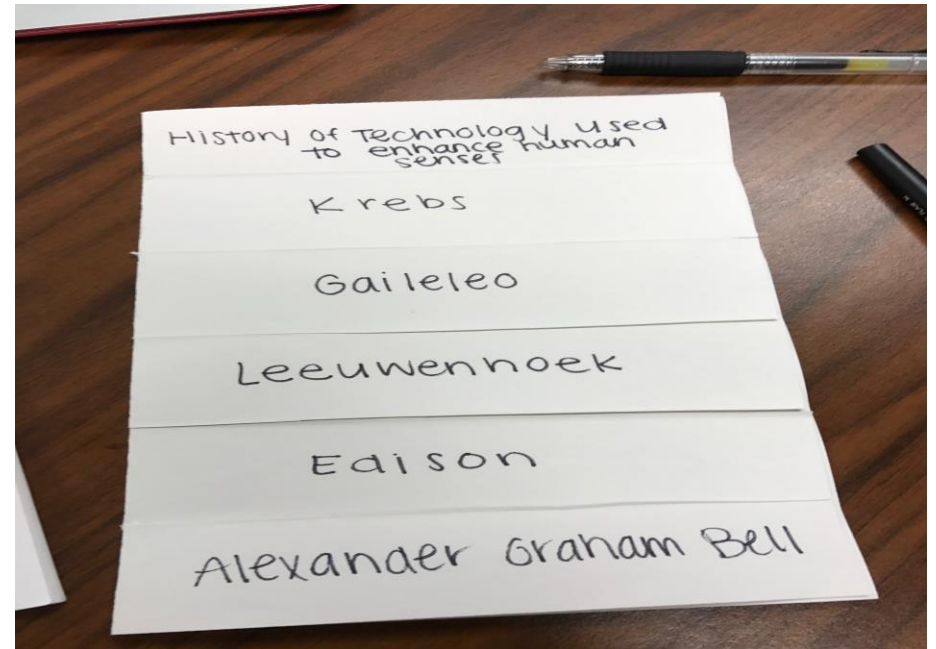


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## Elaborate – String Phone Experiment

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### Data Sheet

Experiment # \_\_\_\_\_:

**Experimental variable:**

**Control variable** (fill in information only for the variables you plan to keep the same):

Length of string: \_\_\_\_\_

Type of string: \_\_\_\_\_

Type of cup: \_\_\_\_\_

**Condition #1:** \_\_\_\_\_

**Trial #1 results:**

**Trial #2 results:**

**Trial #3 results:**

**Condition #2:** \_\_\_\_\_

**Trial #1 results:**

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**Conclusion:**

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**Claim** (Write a sentence stating what you think the best string phone will be created out of.)

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**Claim** (Write a sentence stating what you think the best string phone will be created out of.)

*A string phone with long twine and a Styrofoam cup creates the best communicative device.*

**Evidence** (Provide evidence from the lab to support your claim. Describe the length of the string, type of cup, etc.)

*During the different phases of the labs, the people doing the experiment mainly picked that the long string length made a more clear sound. They overwhelmingly stated that the twine and foam cups were the best when it comes to string type and cup type. This also created a wave with long, spaced apart waves.*

**Reasoning** (Explain how your evidence supports your claim.

Describe what kind of string phone worked the best.)

*This experiment has allowed me to conclude that the best type of string phone is made of long twine string and a Styrofoam cup. These were the best because they consistently created a clear sound when spoken into. This is true because of the many trials conducted supporting this claim.*

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## Big Ah-Ha Thesis

The purpose of this unit was to understand the way waves and technology enhance our human senses. We created an invention, investigated how inventions and senses work, and completed the string phone experiment to gather lines of evidence.

We studied the different technological inventions over the years. We related these inventions to our senses and how they work. We also looked at the different kinds of waves and what kind of characteristics they possess.

We discovered that technology uses different waves to create a perfect wave. For inventions involving sound, they create a perfect pitch. For inventions involving light, they take waves and create a perfect image. This allows our senses to act like they are enhanced. We also learned that when we create waves that are the most clear, we can hear the best.

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Before this unit, I really had not thought much about the way that waves and technology can enhance our senses. The activity that helped me understand this the best was when we investigated the history of inventions and how they used waves. My favorite lab was the string phone experiment. It was fun to test which phones worked the best!

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## Informational Texts Reading Questions

### True or False

1. Krebs used knowledge of lenses to make spectacles for the nearsighted.
2. Edison made a microscope that enhanced the human eye.
3. All waves have amplitude, wavelength and frequency.
4. A high frequency creates a low pitch.

### Fill in the Blanks

5. Galileo improved the \_\_\_\_\_ to find moons of Jupiter, Saturn's rings, stars of the Milky Way, etc.
6. Leeuwenhoek made a microscope that could magnify up to \_\_\_\_\_ times of the human eye.
7. \_\_\_\_\_ is a description of a sound as high or low.
8. Wavelength is the \_\_\_\_\_ between two consecutive crests or troughs of a wave.

### Short Answer

9. What did Alexander Graham Bell invent? How did it work? How did it enhance human senses?
10. What are devices you use today that enhance your senses?
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1. True
2. False
3. True
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5. Astronomy telescope
6. 270
7. pitch
8. distance
9. (Answers will vary) – the telephone – it converts sound into electrical impulses of various frequencies a back to a tone that sounds like the original voice
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