**Name Date Block**

**Energy: Properties of Waves Pre-Test**

1. What do playing a guitar, banging a drum, and dropping a pebble in the water have in common? (6.P.1.1)

A.  They all produce light.

B.  They all cause vibrations.

C.  They all convert heat to energy.

D.  They all need gravity to move.

2. Sound waves, water waves, and light waves are all alike in that they all \_\_\_\_\_\_\_\_\_\_\_\_. (6.P .1.1)

1. Move energy from one place to another
2. Move at the same speed
3. Move without vibrating
4. Move the fastest in water

3. What is the distance between two consecutive points in phase on a wave called? (6.P.1.1)

1. Frequency

B. Period

C. Amplitude

D. Wavelength

4. Which statement best explains why thunder is heard after lightning is seen? (6.P.1.1)

1. Light travels faster than sound
2. Light travels slower than sound
3. Thunder is produced by the impact of lightning against the ground
4. The eye works faster than the ear

5. Regions in a sound wave where particles are farthest apart are called \_\_\_\_\_\_\_\_\_. (6.P .1.1)

A. Compressions

B. Condensations

C. Depressions

D. Rarefactions

1. Selena stretches a rubber band across a box and lets it go. What is produced? (6.P.1.1)
2. Electrical energy
3. Magnetic energy
4. Sound waves
5. Light waves
6. How can you classify energy according to its waves? (6.P.1.1)
7. According to the waves’ frequency, amplitude, and loudness.
8. According to the waves’ wavelength.
9. According to the waves’ crest and trough.
10. According to its sound.

**Properties of Waves Guided Notes**

***What is a Wave?***

A wave is a that travels through a medium from one location to another.

A is the motion of the disturbance

***Slinky***

When the slinky is stretched from end to end and is held at , it assumes a natural position known as the  **or rest position.**

To introduce a wave here we must first create a . We must move a particle away from its rest position.

***Slinky Activity***

One way to do this is to quickly move the slinky forward. The beginning of the slinky moves away from its equilibrium position and then back. The continues down the slinky.

This disturbance that moves down the slinky is called a \_\_\_\_\_\_\_\_\_ . If we keep pulsing the slinky back and forth, we could get a repeating disturbance.

This type of wave is called a wave.

The pulse is transferred through the of the slinky, but the slinky itself does not actually move.

It (moves) from its rest position and then returns to it.

The metal of the slinky is the in that transfers the energy pulse of the wave. The medium ends up in the same place as it started

It just gets disturbed and then returns to it . The same can be seen with a stadium wave. Let’s start the wave!

***Longitudinal Wave***

The medium particles vibrate to the motion of the pulse.

What does parallel mean?

This is the same type of wave that we use to transfer .

How does this happen?

***Transverse Wave***

Transverse waves travel to the disturbance.

What does perpendicular mean?

How is this different than longitudinal waves?

***Longitudinal vs. Transverse***

waves can be seen when we wiggle the slinky up and down.

They also occur when the source disturbance follows a motion. A spring or a pendulum can accomplish this.

The wave formed here is a wave.

***Periodic Waves***

Think of some things that happen periodically….Weather patterns, Temperatures, Imperfections in cable. What are some others?

***Parts of a Wave***

The points A and F are called the **\_\_\_\_\_\_\_\_\_\_\_\_**of the wave.

This is the point where the wave exhibits the maximum amount of positive or \_\_\_\_\_\_\_\_\_displacement. The highest it’s going to get!

The points D and I are called the of the wave.

These are the points where the wave exhibits its negative or downward displacement. The lowest it’s going to get!

The distance between the dashed line and point A is called the of the wave.

This is the maximum displacement that the wave moves away from the .

The distance between two similar points is called the wavelength. The easiest to see is between 2 crests.

Between what other points (pairs) can a wavelength be measured?

***Frequency***

You should know that frequency measure how often something happens over a certain amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

We can measure how many times a wave passes a fixed point over a given amount of time, and this will give us the .

If I move a slinky up and down, and count that 10 waves pass a point in 5 seconds. What would the frequency be?

cycles / second Hz

Use the term (Hz) to stand for cycles per second.

***Period***

The period describes the same thing as it did with a pendulum. It is the time it takes for one cycle to complete. It also is the of the frequency.

What does reciprocal mean?

T = 1 / f f = 1 / T

***Wave Speed***

You can use what we know to determine how a wave is moving.

What is the formula for velocity?

What distance do we know about a wave?

What time do we know?

Plug these values in and get:

Velocity = Length of wave / Time for wave to move pass a fixed point

V = λ / T \*The symbol λ represents wavelength

What does T equal in terms of frequency?

You can also write: V = f λ

Velocity = Frequency x Wavelength

This is known as the .

**Career Day!**

**Engineering Web Quest**

**1. Engineering**

**https://www.youtube.com/watch?v=98OQpZPOnko**

**A. What is an engineer?**

**B. List the steps of the engineering process**

**1. 2. 3.**

**4. 5. 6.**

**7. 8. 9.**

**2. Product Engineer**

**https://www.youtube.com/watch?v=Llk04somtBU**

**A. List 3 things that a product engineer does.**

**B. What are the goals of a product engineer?**

**C. What are potential problems that product engineers could face? List at least 2 and explain your answers.**

**3. Materials Engineer**

**https://www.youtube.com/watch?v=DtosXFgP7C4**

**A. List 4 things that Materials Engineers work with**

**1. 2.**

**3. 4.**

**B. Name at least 3 things that Materials Engineers have created.**

**C. What are potential problems that materials engineers could face? List at least 2 and explain your answers.**

**D. What kind of education would you need to be a materials engineer?**

**4. Process Engineer**

**http://www.aboutbioscience.org/careers/processengineer**

**A. What are the 2 main responsibilities of a Process Engineer?**

**B. List at least 3 other people a Process engineer might interact with.**

**C. What are potential problems that process engineers could face? List at least 2 and explain your answers.**

**D. What kind of education would you need to be a process engineer? What high school courses could you take?**

**5. Controls Engineer**

**http://education-portal.com/articles/Become\_a\_Controls\_Engineer\_Education\_and\_Career\_Roadmap.html**

**A. What are at least 3 things that a Controls Engineer does?**

**B. What are potential problems that controls engineers could face? List at least 2 and explain your answers.**

**C. What kind of education would you need to be a Controls engineer?**

**D. What special skills might you need to be a controls engineer?**

**6. Test Engineer**

**https://www.youtube.com/watch?v=ijX7WAtjOdM**

**A. List at least 4 things that Test engineers do.**

**B. What special skills might you need to be a Test engineer?**

**C. What kind of education would you need to be a Controls engineer?**

**D. What are potential problems that controls engineers could face? List at least 2 and explain your answers.**