8th Grade Worksheets

Follow along with your VSVS team using these sheets and info!

Electromagnetism Observation Sheet

Name_____

1. How many paper clips can you pick up with the nail plus 50 coils?

_____

2. What happens when the circuit is broken (the switch no longer pressed)?

_____

3. How many paper clips can you pick up with the nail plus 10 coils?

_____

4. What materials are necessary to make an electromagnet?

_____

5. What makes an electromagnet stronger?

_____

6. Is the magnetic field around the electromagnet similar or different to that around a magnet? How?

_____

7. What happens when you move the magnet over the coil plus the iron rod?

_____

8. What materials are necessary to make a motor?

_____

9. What does the LED lighting up tell us?

_____

Electromagnetism Observation Sheet Name Answer Key

1. How many paper clips can you pick up with the nail plus 50 coils? more*

2. What happens when the circuit is broken (the switch no longer pressed)?
The nail ceases to be magnetic.

3. How many paper clips can you pick up with the nail plus 10 coils? less*

4. What makes an electromagnet stronger?
More coils in the wire.

5. Is the magnetic field around the electromagnet similar or different to that around a magnet? How?
similar - magnetic field looks the same.
different - you need electricity for one, not the other.

6. What happens to the current reading on the meter when you move the magnet past the coil plus the iron rod?
goes up - magnet induces current in coil.

7. What does the movement of the meter needle tell us?
The magnet induces current in the copper coil.

8. What happens to the meter needle when you gently turn the motor with your finger?
Changing direction changes the direction of the current.

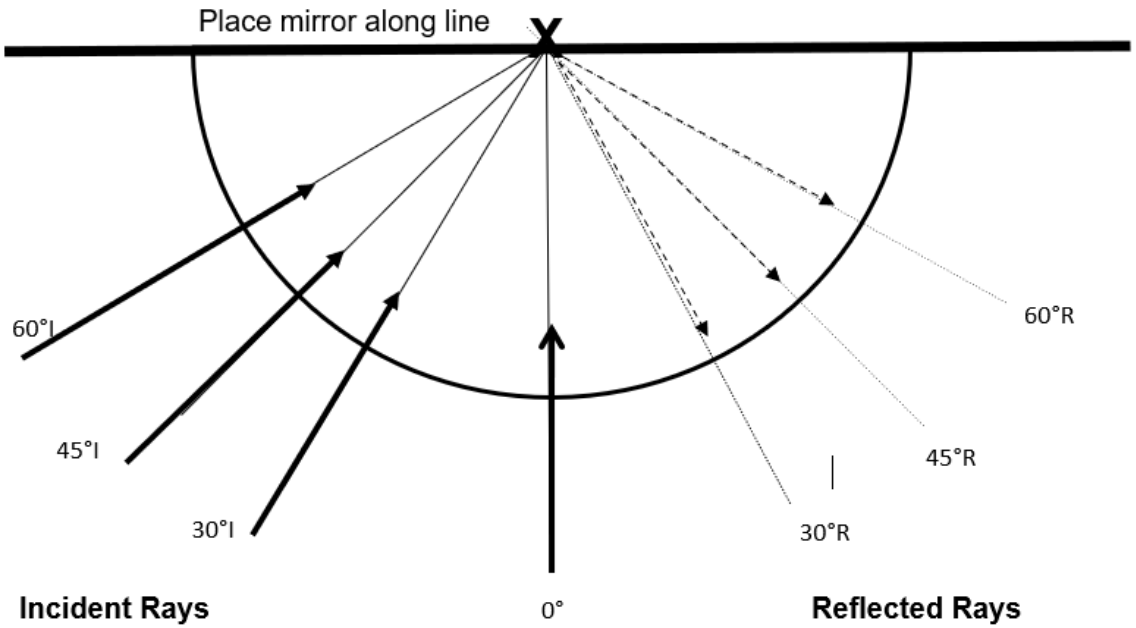
9. By turning the motor, what are you doing?
Converting mechanical energy to electrical energy.

10. With the motor hooked up to the batteries, what happens when you press the switch?
The motor turns.

11. What materials are necessary to make a motor?
A permanent magnet, electromagnet, copper wire, battery.

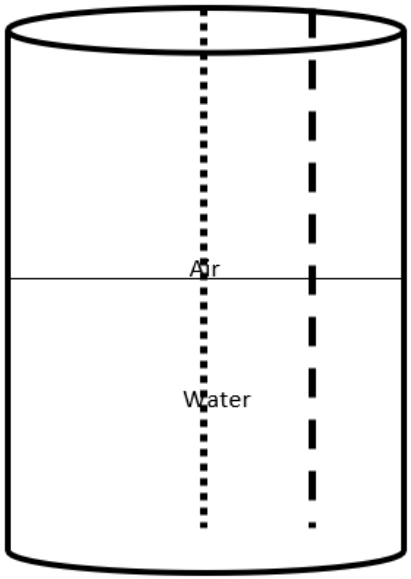
12. What does the LED lighting up tell us?
The circuit has been completed / you have converted energy types.

OBSERVATION SHEET



1. Reflection

Incident Angle	Angle of Reflection
45º	



2. Refraction

Draw what the straw looks like when it has has been moved to the side of the jar.

Hold this observation sheet behind the jar.

Mark the position of the red dot from the laser when it is shone thru air and then water, along dashed line and then the dotted line.
Explain_____

_____

_____

3. Diffraction

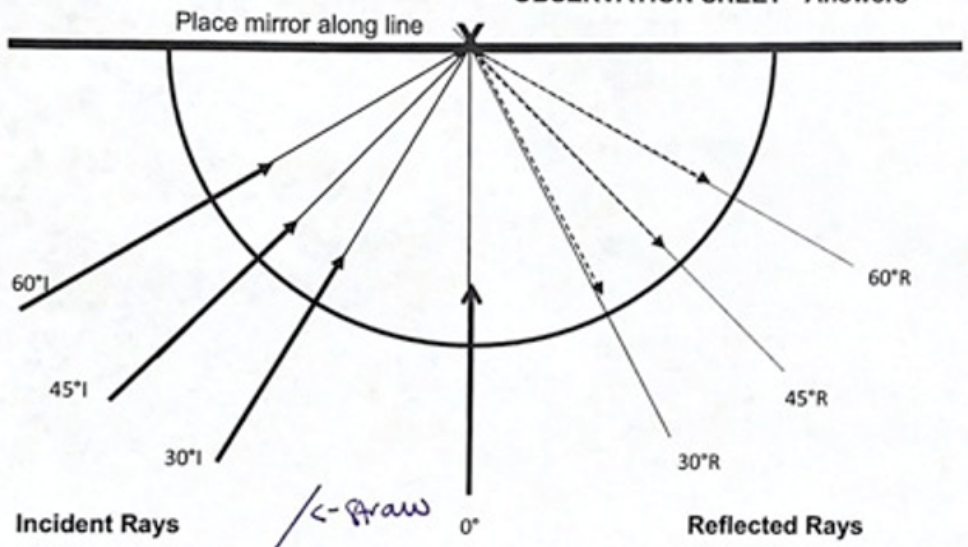
What colors do you see through the diffraction grating? _____

_____

From the CD? _____

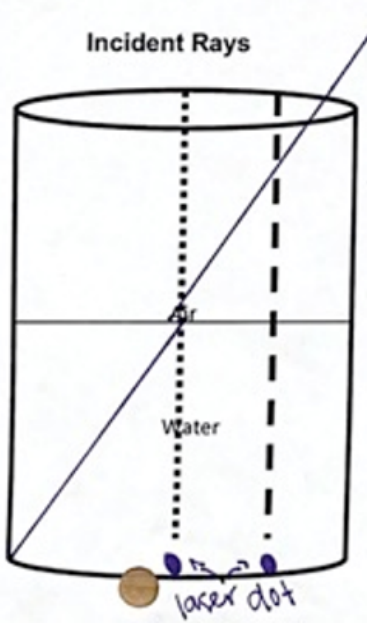
_____

OBSERVATION SHEET - Answers



1. Reflection

Incident Angle	Angle of Reflection
45°	45°
60°	60°
30°	30°
0°	0°



2. Refraction

Draw what the straw looks like when it has has been moved to the side of the jar.

Hold this observation sheet behind the jar.

Mark the position of the red dot from the laser when it is shone thru air and then water, along dashed line and then the dotted line.

Explain Since the light is shining into the water straight (not angled), it still appears straight to the bottom.

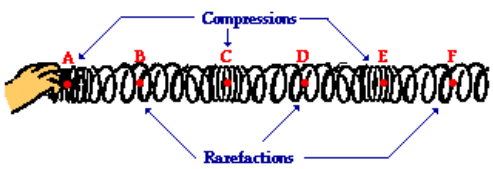
3. Diffraction

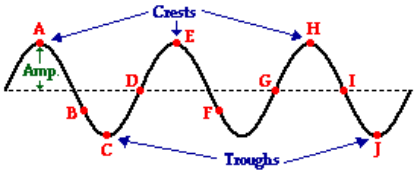
What colors do you see through the diffraction grating? red, yellow, blue, purple, green

From the CD? green, yellow, orange

SOUND AND RESONANCE: Observation Sheet

Names _____





Compressional wave Transverse wave

http://www.physicsclassroom.com/class/waves/Lesson-2/The-Anatomy-of-a-Wave

Tuning fork frequency	**Keynote**	**Which tube (#) produced the loudest resonance?**

Length of tube

Tube number	Length of tube
0	30.6cm = .306m
1	32.2cm = .322m
2	36.5cm = .365m
3	41.1cm = .411m
4	465cm = .46m
5	49.3cm = .493m
6	55.1cm = .551m
7	63.5cm = .635m

Calculation of Speed of Sound (Optional)

$v = f \times \lambda$

Speed (**v**) = frequency (**f**) x wavelength (**λ**)

1. The **FREQUENCY (f)** of the tuning fork =_____Hz
   (Shown on the fork)

2. Number on tube that resonates with tuning fork =_____

3. Length of this tube =_____meters
   (Look at the "Length of Tube" **Table above.)**

4. The WAVELENGTH (λ) of sound = length of tube x 2 =_____meters

5. Speed of sound = wavelength x frequency = value in #4 x value in #1.=_____m/s

Observation Sheet - Answers

Tuning fork frequency	**Keynote**	**Which tube (#) produced the loudest resonance?**
440	A	#2
392	G	#3

Length of tube

Tube number	Length of tube
0	30.6cm = .306m
1	32.2cm = .322m
2	36.5cm = .365m
3	41.1cm = .411m
4	465cm = .46m
5	49.3cm = .493m
6	55.1cm = .551m
7	63.5cm = .635m

Calculation of Speed of Sound (Optional)

1. The **frequency** (**f**) of the tuning fork (shown on the fork)	= 440 Hz	= 392 Hz
2. Number on tube that resonates with tuning fork	= #2	= #3
3. Length of this tube (Look at the Length of Tube Table above.)	= .365 meters	= .411 meters
4. The **wavelength** (**λ**) of sound = length of tube x 2	= .73 meters	= .822 meters
5. Speed of sound = wavelength x frequency = value in #4 x value in #1.	= .73 x 440 =321.1 m/sec	=.822 x 392 =322.2 m/sec