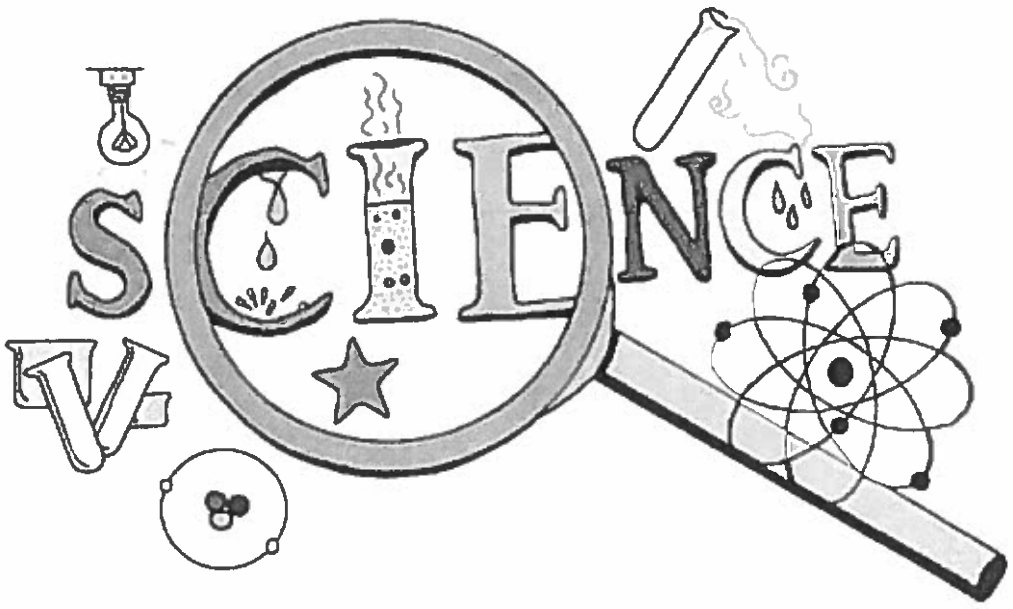
Lathrop Intermediate

8th grade Science

1st Semester



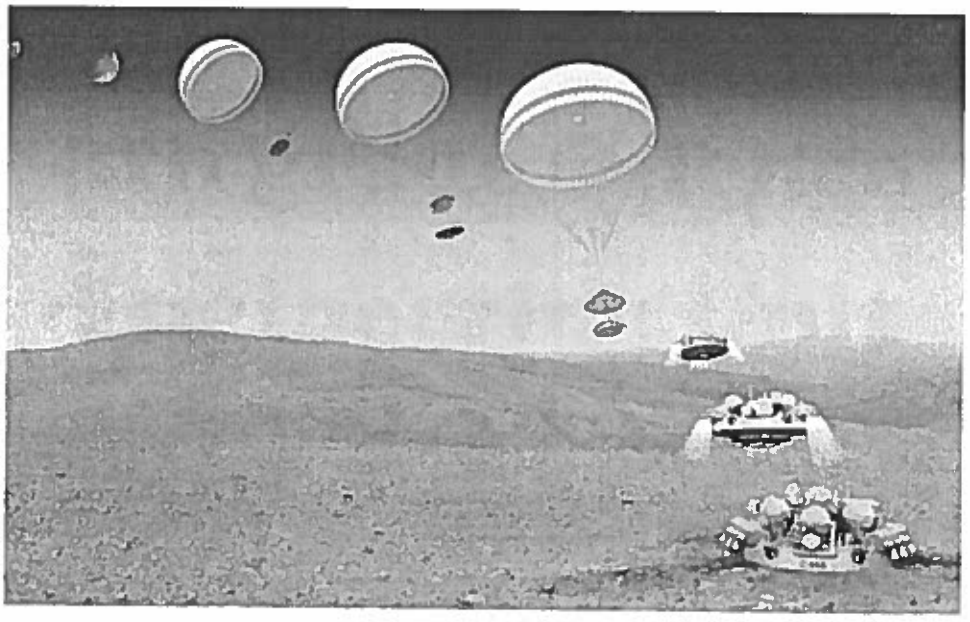
Name: _____

Teacher: _____

Period: _____

Lathrop Intermediate

8th grade Science Engineering Unit



8.0.0 Task - Building a Plane (Print 2 copies and place in plastic sleeves)

Guiding Question: How do we talk and work together like engineers?

Introduction

Have you ever seen a hang-glider or a parachute? Have you ever wondered what the engineers needed to think about in order to build a device that lands? Throughout the year you will be asked to think and work like an engineer to design and build different types of things to solve a specific problem.

Task

Build two paper planes; one that can travel the farthest and one that can stay in the air the longest.

Time: 55-minutes

Materials: (per group)
- 2 sheets of paper
- Optional: 30 cm of tape

Procedure:

1. Explore plane designs (10-minutes)
2. Use Academic Discussion Scaffolds to create a model (10-minutes)
3. Building a Prototype (15-minutes)
4. Prototype Analysis (10-minutes)
    a. As a class, record observations in the data table and analyze each prototype.

Lander Prototype Evaluation Criteria	
Materials	You must use all of the materials supplied.
	You may cut the any of the materials provided.
Test	All planes will released at the same starting point.
	Time will be recorded from release to touchdown.

Reflection: (10-minutes)

Teamwork
- Complete the Collaboration and Teamwork Rubric.
- As a team, be prepared to share your team's thinking and decision-making process.

Individual Reflective Questions

Answer the following questions individually.

1. What were the main structural features of your prototype? How did your team decide on these features?
2. How could you improve the design of your prototype?
3. What previous science knowledge or experiences did you use to design and build your prototype? Explain how your knowledge or previous experiences helped you to design and build your prototype.
4. What were some of the strengths of working together as engineers for the task? What are some areas that your team needs to improve when you work on the next task together?

Paper Plane Prototype Data Table

Design 1

Team #	Distance (m)	Time (s)	Observations

Paper Plane Prototype Redesign Graphic Organizer

Name: _____ Period: ____ Date: _____

Design 1	***Design 2***

Redesign in Prototype Description (C)

_____

_____

_____

Redesign: Structure and Function Explanation (R)

_____

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Evidence (E)

1. _____

_____

2. _____

_____

3. _____

_____

Paper Plane Prototype Data Table

Design 2 (Redesign)

Team #	Distance (m)	Time (s)	Observations

8.0.0 - Resource Sheet - Formative Assessment

Report to the your Aeronautical Engineer Team

Directions:

You are an engineer investigating devices that travel the farthest and can stay in the air the longest. Write a report updating your team about your plan to build paper plane prototypes.

In your report, include the following:

1. Explain how your team will work together to design the paper plane prototypes.
2. Describe main structural features for the planes your team might include. Use evidence based on your previous experience(s).

Word Bank

design	collaboration	infer	function
model	evidence	reinforcement	
prototype	observe	structure	engineering design process

C.H.A.T. To The Text

C – **Circle** the **vocabulary** words that you don't know or that might be challenging for other students in your class

H – **Highlight** the **evidence** to support the author's claim

A – **Annotate** the Text. **Add comments**, questions, connections, A-Ha moments or summarizing statements in the margins of the text. Every time you highlight something, you must add an annotation!

T – **Talk** to the Text. Underline, label and explain any **Cross Cutting Concepts**. You may want to use different colors to help show different CCC's.

1. **Patterns:** Do you see any patterns in what you read to the real world or to other science topics?
2. **Cause and Effect:** Do you see variables that you could test? Does one variable cause an effect on the other variable?
3. **Scale, Proportion, and Quantity:** If you changed the variables to a different size, amount of time, or energy, would there be a proportional change to another variable?
4. **Systems and System Models:** Could you design a system or use a current system to predict changes or design a solution to a current societal need or want?
5. **Energy and Matter:** If you were to track how the energy transferred or how the matter changed, could it help you understand how a system works or make any new conclusions?
6. **Structure and Function:** Can you see any way that the structures are shaped relate to the job they have to do or the way they behave?
7. **Stability and Change:** Can you see a way that a system is working to reach stability? Or, can you see how changes to a system can affect the stability of a system?

1. Annotate title
2. Annotate pictures
3. # paragraphs

Read through #1

4. Circle vocab
5. Add definitions/synonyms based on context for circled vocab

Read through #2

6. Highlight important details of article

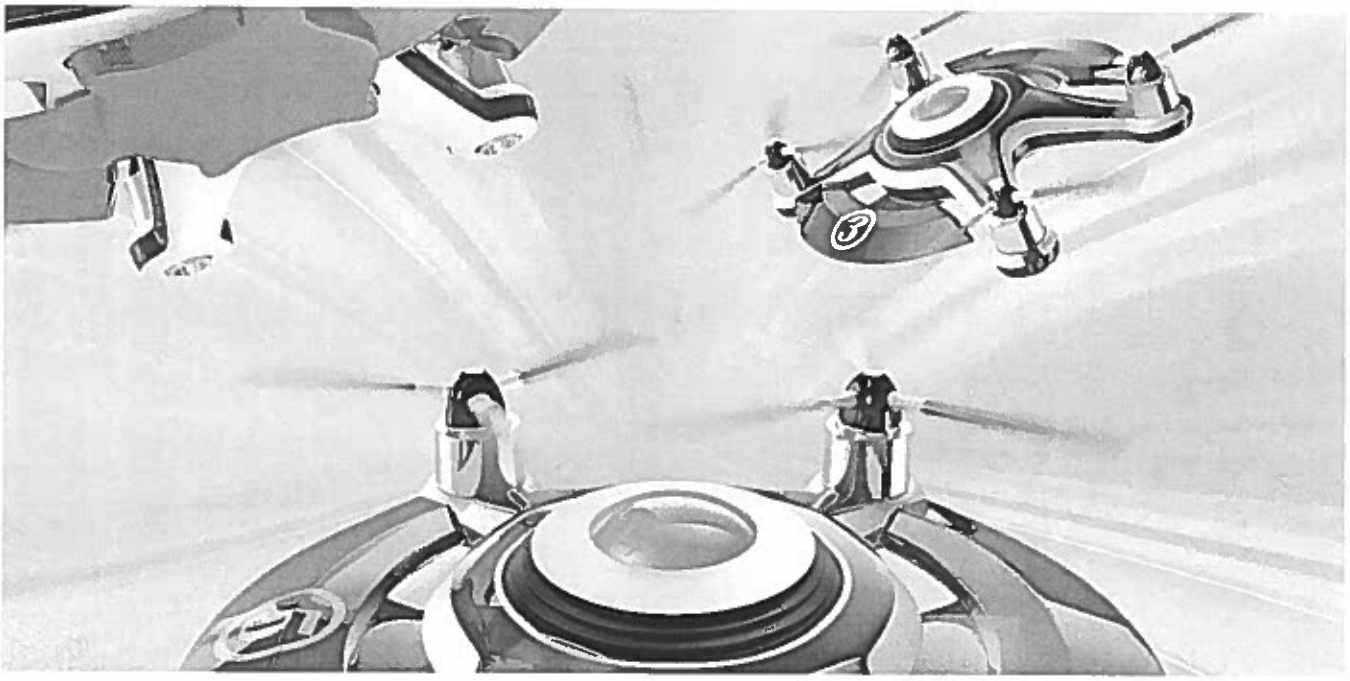
Read through #3

7. Add annotation for ALL highlights (questions you have about it, why is it important, what does it mean?)
8. Underline the main sentence(s) that let you know what the cross cutting concept is and put CC: (and the concept it is) next to it

"CHAT To The Text" and Annotating List Rubric

TASK	5	4	3	2	1
Annotate the Title Explain what you know or want to know about the subject					
Annotate Pictures Explain drawings, pictures, or graphs in your own words					
Vocabulary Circle vocabulary words and words you do not know Add definitions using context clues, notes, or class discussions					
Highlight Evidence to support or refute the author's claim.					
Annotate Highlighted Passages With: Questions that pop up for you as you read. OR Connections between the reading and your self, the world or something else you've read.					
Underline and Identify Cross Cutting Concepts					

THE CONVERSATION
Academic rigor, journalistic flair



Amazon delivery drones are just the first step to a highway in the sky

July 27, 2016 9.34am EDT

Shutterstock

Author

Andy Miah
Chair in Science Communication & Future Media, University of Salford

Amazon recently announced plans to test a drone delivery system in parts of the UK that are hard to access with conventional delivery methods. While much attention has focused on the service it would provide to Amazon customers, the really interesting story is what this agreement with the British government tries to achieve on a much broader level.

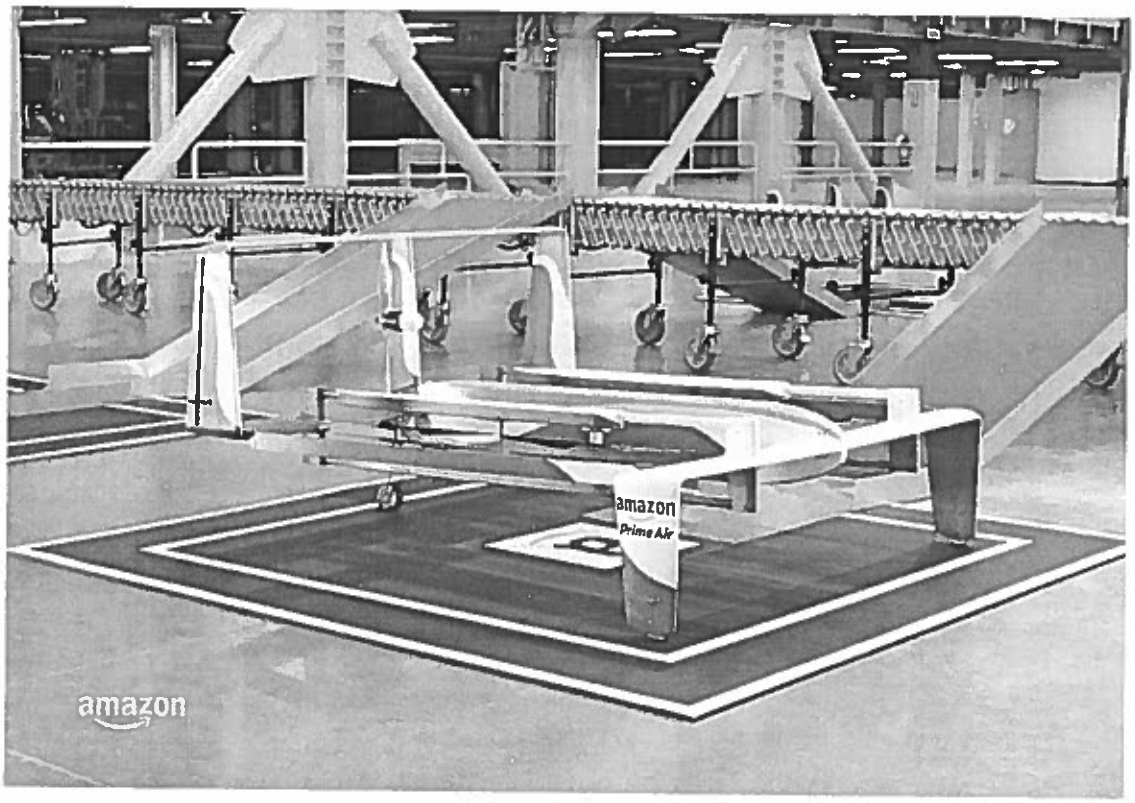
If successful, it will essentially create a high-altitude floating highway between 200 and 400 feet above the ground, within which a whole range of activities could be performed. As a result, everything from drone ambulances to drone police surveillance are on the cards for our future. So how ready are we for this transformation of air space?

Amazon's announcement reveals the plan focuses on three key aspects of drone technology that the UK's Civil Aviation Authority has said it wants to see innovation in.

The first of these is collision avoidance technology, the kind you already find in cars, where sensors detect how close the car is to another object or vehicle and prevents it from crashing. This is important because present rules ban users from flying their drones outside of their line of sight, so they can always take control if there's a problem. Collision avoidance does away with that need because the drone would be able to stop itself from causing accidents.

The second technology is fully autonomous systems, essentially intelligent flying machines that would require very little – if any – human control. Such devices could be capable of deciding where and when they fly, and could be mixed use systems. The same drones could conceivably be used to provide emergency support to patients in need of blood quickly, or for delivering a stove to campers who forgot to pack everything.

The third objective is to test out a system that would enable a single operator to fly multiple drones at the same time. This points to the possibility of fleets of flying objects that could undertake any number of operations, from police surveillance and crowd management, to disaster monitoring and rescue operations. For example, if a mountaineer is lost in the hills, a single operator could manage a number of drones to fly across a region and identify the site where the person is located. Together, the drones will share information to speed up the process and ensure support is provided as quickly as possible.



Ready for launch, Amazon

Cracking these technological challenges is a core priority for drone regulators, not least because it will open up drones for use in all kinds of other capacities. For instance, in the last two years, researchers have been developing a drone ambulance. This is essentially a flying defibrillator that could be sent out to someone having a medical emergency and used by a bystander to provide essential care when

no other alternative is available. We can expect to eventually see drones flying urgent medical products around the UK, helping to save lives and beat the current limitations of ground deliveries.

Amazon already has a remarkable delivery network and moving into drones at this early stage will ensure it dominates future airborne delivery systems, as well as adding to its brand image of being a technology innovator. So, it's reasonable to assume that the British government is working with Amazon to enhance its capacity to pursue a range of other drone applications, from connecting drones to smart city technology to enabling all kinds of surveillance. After that, a wide variety of commercial interests will follow with any number of claims being made to occupy our low-level air space.

Privacy concerns

These prospects won't sit well with everyone and there are already indications of how the public will resist such trends. In the US, for example, a project called "No Fly Zone" allows people to register the air space around their homes as private and is calling on drone manufacturers to pre-program their machines to avoid it.

The proliferation of drones around us in the world also raises the questions of how they will all be organised. Will drones be flying around randomly, avoiding each other with their collision avoidance technology? There is a good chance that a drone highway will actually mirror our present-day road network.

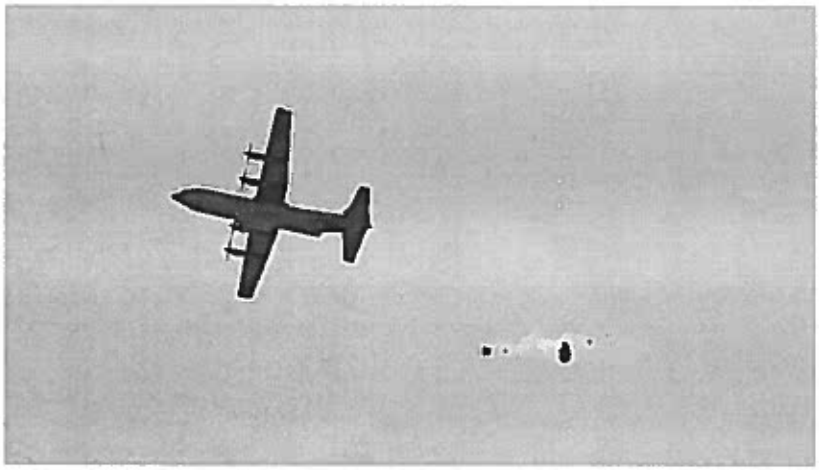
The advantage of this would be that drones could count on an established configuration of routes that are mapped out around the world. This may not be the most direct flight path but it takes into account that drone highways, like our present road network, will become quickly congested. This kind of issue shows why we need some sensible rules to avoid catastrophic failure.

Logistics Drones UAVs Amazon Unmanned aerial vehicles UAV

MILITARY

Lockheed Martin WindTracer system to improve airdrop accuracy

David Szondy | June 15, 2014



WindTracer will drop out of aircraft to evaluate atmospheric conditions for accurate air drops (Image: US Air Force)

VIEW GALLERY - 2 IMAGES

For a besieged soldier or a disaster victim, a plane dropping supplies is the most welcome sight in the world - unless the drop ends up drifting off out of reach. To help make sure that airdrops end up where they belong, the US Air Force Research Laboratory (AFRL) has awarded a contract to Lockheed Martin to adapt its WindTracer wind measurement system for a Precision Air Drop (PAD) system to help aircrews land supplies faster and on target.

Since its development during World War II, the airdrop has become standard operating procedure for the world's air forces when delivering supplies in times of war and natural disasters. In principle, it's a fairly simple job. You take a pallet of cargo, strap a parachute on it, shove it out the back of a Hercules or a similar cargo plane, and the groceries float safely to Earth.

Unfortunately, where a parachute lands depends very much on how the wind blows, as French troops learned in 1954 as they watched in despair when supplies meant for them drifted into the hands of the enemy during the Battle of Dien Bien Phu. For an accurate air drop, the crew needs a detailed profile of the winds, which can vary a great deal with altitude, from the plane down to the ground.

Lockheed's WindTracer is a commercially available wind-profiling Lidar technology that's been used at airports around the world for over a decade to give warnings of dangerous wind shears. It works by beaming pulses of infrared light that bounce off dust particles suspended in the atmosphere. As the light bounces back, the WindTracer can measure the speed and direction that the particles, and therefore the wind, is moving. That way, air traffic controllers get warnings about wind shears and other dangerous wind conditions and can warn pilots accordingly.

So it can be delivered to remote bases, PAD will be a ruggedized, miniaturized version of WindTracer set on a pallet for its own air drop. After it is deployed to the ground, troops will hook up to an equally small and rugged telemetry system. The idea is that instead of making several passes over a drop site to gauge the wind, PAD's lidar measures the wind speeds and directions, and beams the results back to the aircrew, who can compensate when dropping the actual load.

"Currently airdrop missions require several flyovers to accurately determine wind readings, but our WindTracer technology would eliminate the need for so many passes," says Dr. Kenneth Washington, vice president of STAR Labs, Lockheed Martin's space technology research and development group. "WindTracer is an adaptable commercial system. By developing this prototype, we're putting this technology on a path for fielding."

Source: Lockheed Martin

Update (Aug 7, 2014): The text relating to airdrops was edited to reflect the fact that the WindTracer doesn't operate while being dropped from the aircraft, but is ruggedized so it can be delivered to a base via aircraft, where it will then operate from the ground. We apologize for the error.

Guiding Question: How can failure lead to innovation?

Introduction

Have you ever seen a hang-glider or a parachute? Have you ever wondered what the engineers needed to think about in order to build a device that lands? Throughout the year you will be asked to think and work like an engineer to design and build different types of things to solve a specific problem.

Task

Build a device that lands slower than other groups' device being built.

Time: 47-minutes

Materials: (per group) • 1 paper plate • 2 rubber bands • 1 dixie paper cups	• 2 balloons • 1 small (paper or ziplock) bag • 30 cm of tape

Procedure:

1. Use the the Quiet Brainstorm & Academic Discussion Scaffolds create a model (20-minutes)
2. Building a Prototype (15-minutes)
3. Prototype Analysis (5-minutes)
    a. As a class, record observations in the data table and analyze each prototype.

Lander Prototype Evaluation Criteria	
Materials	You must use all of the materials supplied.
	You may cut the any of the materials provided.
Test	All landers will released from the same height.
	Time will be recorded from release to touchdown.

Reflection: (10-minutes)

Teamwork

- Complete the Collaboration and Teamwork Rubric.
- As a team, be prepared to share your team's thinking and decision-making process.

Individual Reflective Questions

Answer the following questions individually in your notebook.

1. What were the main structural features of your prototype? How did your team decide on these features?
2. How could you improve the design of your prototype?
3. What previous science knowledge or experiences did you use to design and build your prototype? Explain how your knowledge or previous experiences helped you to design and build your prototype.
4. What were some of the strengths of working together as engineers for the task? What are some areas that your team needs to improve when you work on the next task together?

Lander Prototype Data Table

Design 1

Team #	Time (s)	Observations

Lander Prototype Redesign Graphic Organizer

Name: _____ Period: ____ Date: _____

Design 1	***Design 2***

Redesign in Prototype Description (C)

_____

_____

_____

Redesign: Structure and Function Explanation (R)

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Evidence (E)

1. _____

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2. _____

_____

3. _____

_____

Lander Prototype Data Table

Design 2 (Redesign)

Team #	Time (s)	Observations

8.0.S - Resource Sheet - Formative Assessment

Report to the your Aeronautical Engineer Team

Directions:

You are an engineer investigating devices that land slow.
Write a report updating your team about your plan to build a lander prototype.

In your report, include the following:

1. Explain how your team will work together to design the lander prototype.
2. Describe main structural features for the lander your team might include. Use evidence based on your previous experience(s).

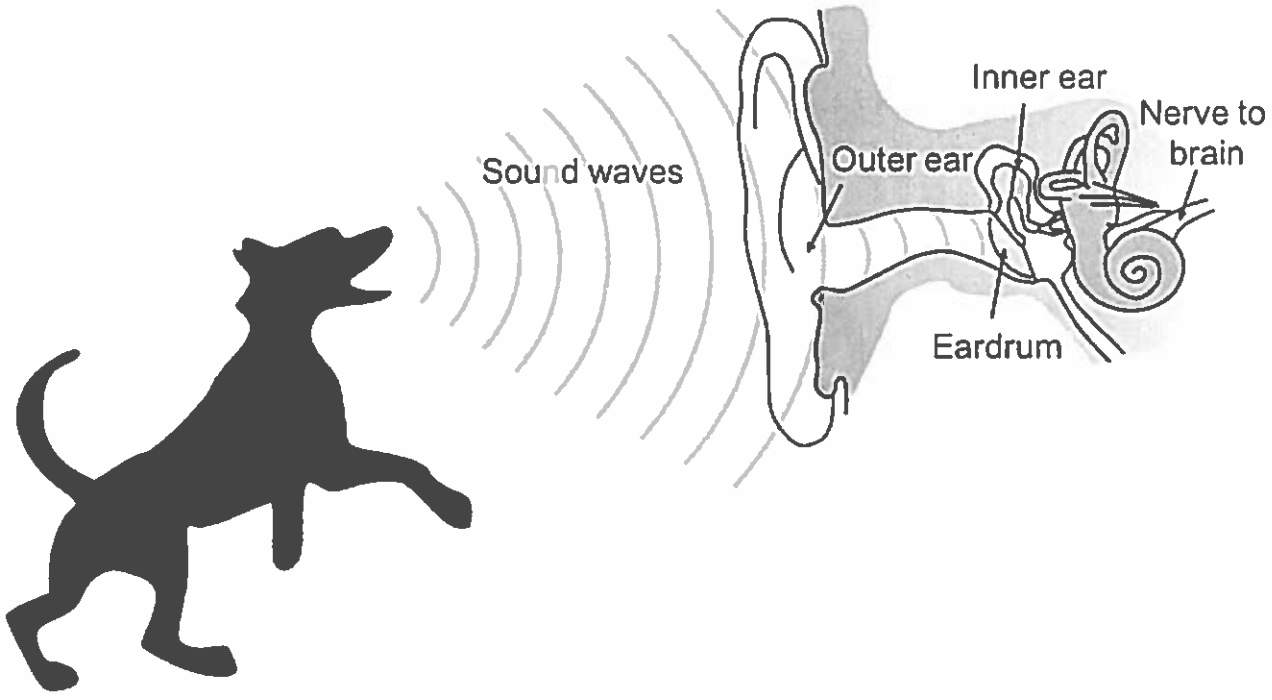
Word Bank

design	collaboration	infer	function
model	evidence	reinforcement	
prototype	observe	structure	engineering design process

OUSD Science

Lathrop Intermediate

8th grade Science
Waves (Sound) Unit



Task: Today you will be guided through three activities. Your goal is to collect data to use as evidence to respond to 3 sound questions.

Task Steps:

1. Copy the **Claim and Evidence Graphic Organizer** into your science notebook. Take notes in this graphic organizer as you gather information to respond to each question.

Claim and Evidence Graphic Organizer

Investigation Question:	**Claim**	**Revised claim AND collected evidence to prove your claim.**
1. How do sounds produced by hitting the bottle with a pencil **differ** from those produced by blowing across the top?		
2. How can you make a **higher pitched** sound? How can you make a **lower pitched** sound?		
3. How can you make the sound **louder**? **Quieter**?		

2. **Video Exploration -** VIDEO - "Billie Jean" on Bottles and Glass Music Xylophone
   a. Review the 3 questions above.
   b. While your teacher plays the following videos, gather information on your graphic organizer to help you respond to each question.
   c. Answer each question to the best of your ability with a **claim**.

3. **Glass Bottle Exploration -**
   a. Your group will be provided with 5 glass bottles and a container of water.
   b. Experiment with your group, gather information on your graphic organizer, and revise your claims to the 3 questions above.
   c. As you collect more information and evidence, do not erase your claims if they change, but explain the evidence you collected that led to a different claim.

4. **Infographic -**
   a. Annotate the **8.3.0 Glass Bottle Infographic Output Sheet** with visuals, notes, and details that clearly explain your discoveries from the investigation. Be sure to complete all steps in the checklist.

Name: _____ Period: ____ Date: _____

8.3.0 Glass Bottle Infographic Output Sheet

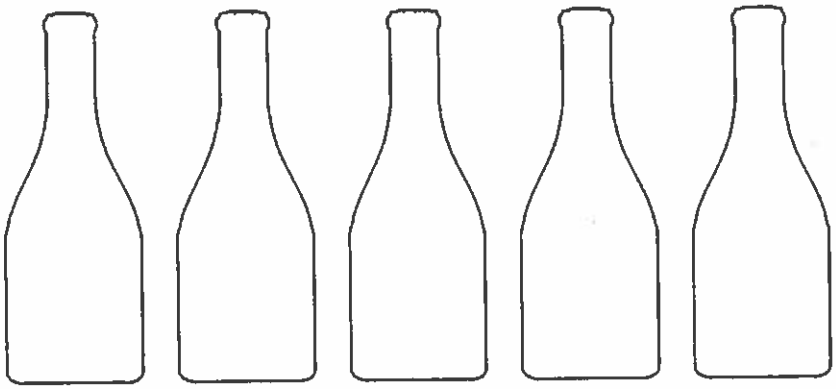
Directions: Annotate the infographics below with the following information:

___ Organize your bottles from low pitch to high pitch (pitch = notes)

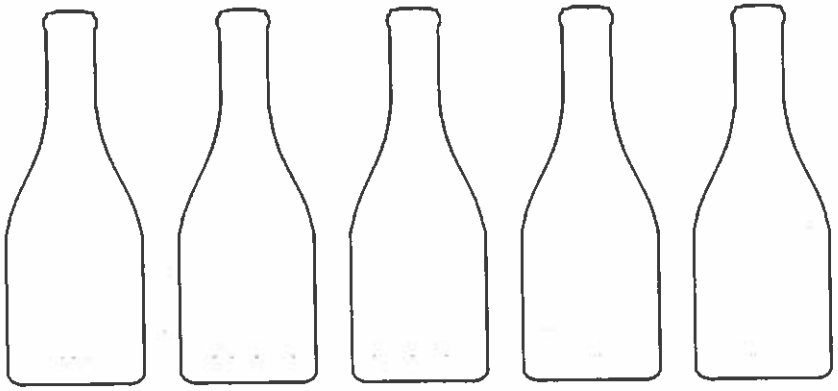
___ Mark and label the water levels in your diagram

___ Annotate your infographic to explain how sounds produced by striking the bottle differ from those produced by blowing across the top.

___ **Add visuals and annotations to your infographic to explain what produces the sound.**



LOW PITCH **BLOWING ACROSS BOTTLES** HIGH PITCH



LOW PITCH **HITTING THE BOTTLE** HIGH PITCH

Guiding Questions: 1) How is sound created? 2)How does does sound travel? 3)What patterns can we observe about sound?

DIRECTIONS: Work together as a team through the tasks below. You will need to stay focused in order to enjoy the entire investigation. Your group will be assessed regularly by your teacher as you work.

PART ONE: Initial Observations

1. Take a tuning fork and hit it with your pencil. Bring it near your ear. What do you observe?
2. Practice hitting the tuning forks with different strengths.
3. Notice the measurement on each tuning fork in Hz (Hertz). Hit and **compare** the sounds of the two tuning forks.
4. After hitting the tuning fork, touch one of the prongs of the tuning fork very gently with your finger. *Discuss your observations with your teammates.*
5. **Complete Section 1 of your 8.3.1 Student Output Sheet: Graphic Organizer.**

PART TWO: Sound Vibrations and Objects

1. Pick up the ping pong ball attached to the string.
2. Let the ball hang from the string and hold the string very still.
3. Hit the tuning fork with your pencil.
4. Now, touch the tuning fork gently against the motionless ball. (See picture to the right)
5. Take turns and experiment/ explore with this.
6. **Discuss** your observations with your teammates.
7. **Discuss the following questions**:
    a. How is sound created?
    b. How does sound travel?
    c. What patterns can we observe about sound?
8. **Complete Section 2 of the 8.3.1 Student Output Sheet: Graphic Organizer**

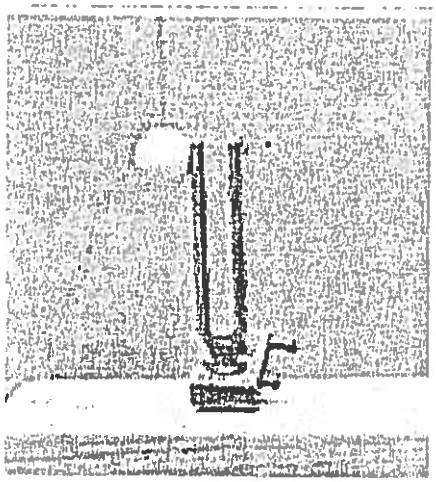


FIGURE 1

Guiding Questions: 1) How is sound created? 2)How does does sound travel? 3)What patterns can we observe about sound?

PART THREE: Sound Waves and Water

1. Fill a cup with water (to the top).
2. **Strongly** hit a tuning fork with your pencil.
3. **Gently** touch the water surface with one of the prongs of the tuning fork (see **FIGURE 2** below).
4. Hit the tuning fork strongly again.
5. Next, dip the prongs of the tuning fork down into water (see **FIGURE 3** below).
6. Take turns and let different group members conduct these tests.
7. **Discuss your observations and the following questions:**
    a. How is sound created?
    b. How does sound travel?
    c. What patterns can we observe about sound?
7. **Complete Section 3 of the 8.3.1 Student Output Sheet: Graphic Organizer**

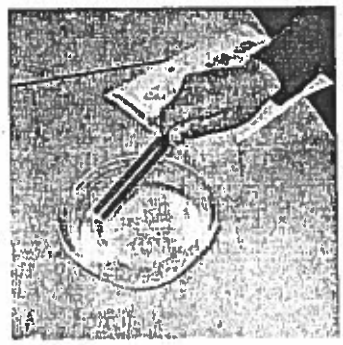


FIGURE 2

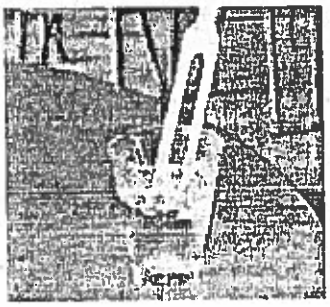


FIGURE 3

PART FOUR: Constructing an Explanation

1. The group **Facilitator** should ensure that everyone is participating during this discussion section.
2. **Facilitator:** Read the following questions (one by one) to the group. Discuss group ideas for each question.
    1. How is sound created?
    2. How does does sound travel?
    3. What patterns can we observe with sound?

3. Once everyone in the group has shared their ideas, individually complete **Section 4** on your graphic organizer.

Tuning Forks Student Output Sheet: Graphic Organizer

Guided Questions: 1) How is sound created? 2) How does sound travel? 3) What patterns can we observe about sound?

Directions: Complete the Graphic Organizer below as you complete your investigation.

Section 1

1. How is sound created? _____

_____

_____

2. How does sound travel? _____

_____

_____

3. What **patterns** can we observe about sound? _____

_____

_____

Section 2: Construct a **model** illustrating and explaining what you observe happening. Label each part of the diagram and describe/explain what is happening.

Tuning Forks Student Output Sheet: Graphic Organizer

Guided Questions: 1) How is sound created? 2) How does sound travel? 3) What patterns can we observe about sound?

Section 3: Construct a **model** illustrating and explaining what you observe happening. Label each part of the diagram and describe/explain what is happening.

Section 4:

1. How is sound created? _____

_____

_____

2. How does sound travel? _____

_____

_____

3. What **patterns** can we observe about sound? _____

_____

_____

Name: _____ Period: ____ Date: _____

8.3.1 - Resource Sheet

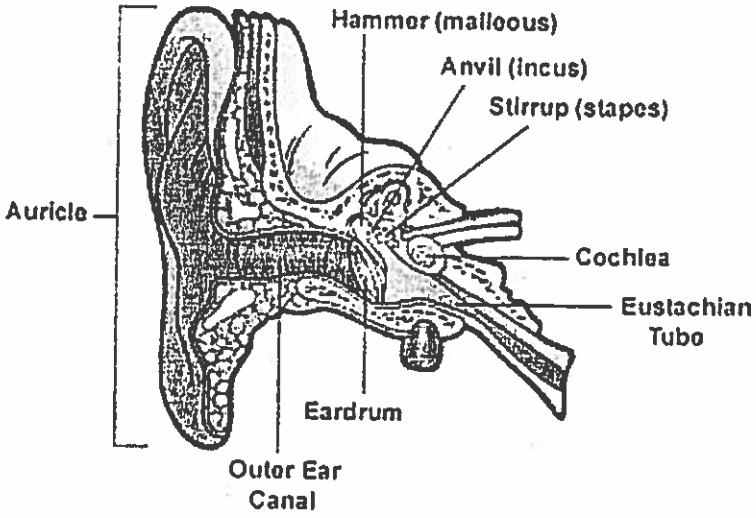
The Middle Ear: Good Vibrations

Focus Question: What effect can very loud music have on your hearing?

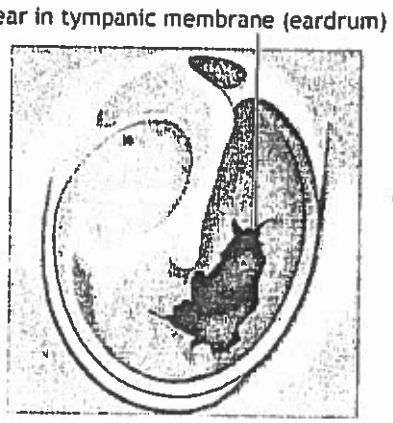
Directions: Read the article closely and follow the instructions on your Talking to the Text Annotating Rubric.

After sound waves enter the outer ear, they travel through the ear canal and make their way to the middle ear. The middle ear's main job is to take those sound waves and turn them into vibrations that are delivered to the inner ear. To do this, it needs the eardrum, which is a thin piece of skin stretched tight like a drum. The eardrum separates the outer ear from the middle ear. In the middle ear, you can find the three tiniest, most delicate bones in your body. They include:

- the **hammer** which is attached to the eardrum
- the **anvil** which is attached to the hammer
- the **stirrup** which is the smallest bone in the body, and is attached to the anvil

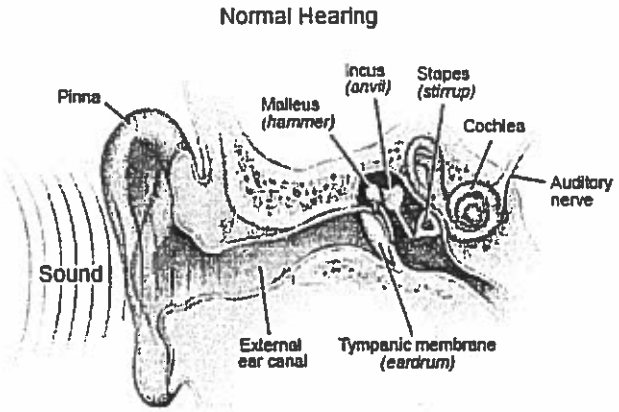


When sound waves reach the eardrum, they cause the eardrum to vibrate. When the eardrum vibrates, it moves the tiny bones — from the hammer to the anvil and then to the stirrup. These tiny bones help sound move along on its journey into the inner ear. Really loud noises, like an explosion, can produce sound waves that are strong enough to damage the eardrum.



Name: _____ Period: ____ Date:

The Inner Ear: Nerve Signals Start Here

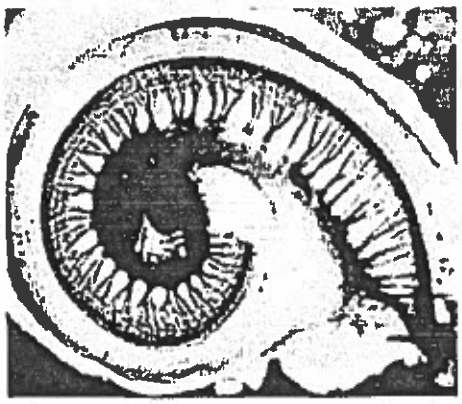


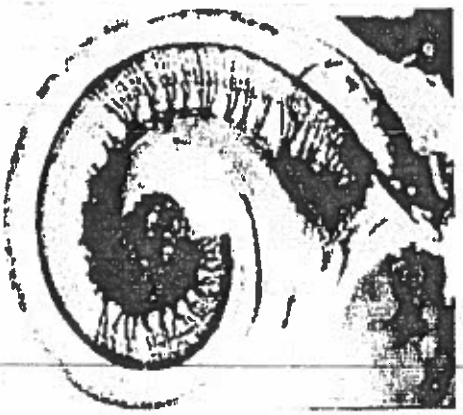
Sound comes into the inner ear as vibrations and enters the **cochlea** (say: KAH-klee-uh), a small, curled tube in the inner ear. The cochlea is filled with liquid, which is set into motion, like a wave, when the small bones vibrate.

The cochlea is also lined with tiny cells covered in tiny hairs that are so small you would need a microscope to see them. They may be small, but they're awfully important. When sound reaches the cochlea, the vibrations (sound) cause the hairs on the cells to move, creating nerve signals that the brain understands as sound. The brain puts it together and hooray! You hear your favorite song on the radio.

Can Music in Your Headphones be TOO Loud?

Pictured is an electron micrograph image from both a normal, undamaged cochlea and one that has experienced extreme noise exposure and hair cell loss. The hair cells are connected to nerves which send messages to the brain and the brain "hears" sound. But as you can see, many of the hairs have been destroyed by exposure to extremely powerful noises. What effect could this have on your hearing?





Which of the pictures above show a healthy cochlea, and which shows a damaged cochlea? Explain.

8.3.2 Task Card - Wave Motion

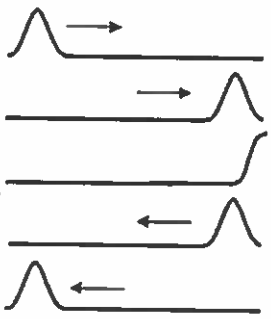
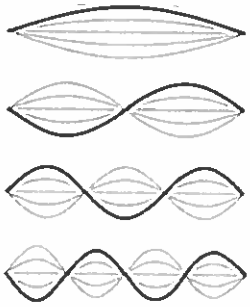
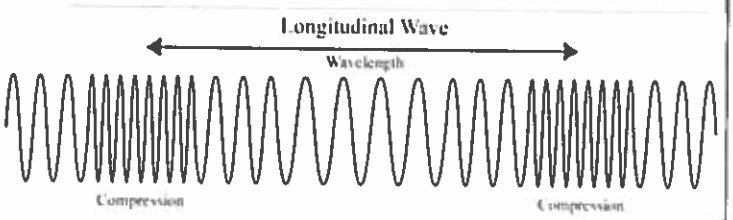
Guiding Question: How do we measure and describe waves?

Task: You are going to create pulse, standing and longitudinal waves using a piece of latex tubing and a slinky. You will construct several models illustrating and explaining your observations.

Task Steps:

Part 1: Exploration

1. Observe the three wave diagrams below.
2. Using the latex tubing or slinky, create the three types of waves in the diagrams: wave pulse, standing waves, and longitudinal waves.
3. Take turns testing how to change the wavelength, frequency, and amplitude of the different waves. Experiment with the tightness and length of the material and speed of your movements.

		
longitudinal wave	**wave pulse**	**standing waves**

Part 2: Modeling Wave Observations

4. In your science notebook, sketch <u>at least three</u> models of the waves you created (at least one model for each type of wave).
   a. <u>Label</u> and <u>explain</u> the **wavelength** in each of your drawings. *How did you manipulate (change) wavelength?*
   b. <u>Label</u> and <u>explain</u> the **amplitude** of your wave pulse and standing waves. *How did you manipulate (change) the amplitudes of the waves you created?*
   c. Make sure you **explain** in your model how to change the **wavelength, frequency,** and **amplitude** of a wave.

Part 3: Classifying Waves

1. Copy the following question and table into your science notebook.

Question: Are the waves you created during today's investigation examples of **mechanical or electromagnetic waves?**

Claim	Evidence

2. Using your knowledge of sound waves and your observations from this investigation, respond to the question with a **claim.** Provide **at least 2** pieces of evidence from today's investigation or other resources in your notebook to support your claim.

Guiding Question: Is a vacuum a medium?

Task: You and your group will complete a short reading on vacuums. Using the information you have gathered from the reading, you will construct a claim supported by evidence responding to the question: Is a vacuum a medium.

Task Steps:

1. Re-read / consider the **guiding question** and share your ideas and thoughts with your group. (2 min)

2. Create a graphic organizer in your notebook containing the following information:
   a. **Guiding Question:** Is a vacuum a medium?
   b. **Claim:** Your response to the question
   c. **Evidence:** Facts and information that supports your claim

3. Read the short article "What is a Vacuum?" out loud in your team. **Rotate around the team, each student reading one sentence then rotating.** (5 min)

4. Once your group has completed the reading, search for evidence that helps you respond to the guiding question. Fill out the graphic organizer in your notebook together as a team. (5 min)

5. **Be prepared to share out if you are called on during the Whole Class Discussion.**

6. **Extra time?** What happens if a person is exposed to the vacuum of space (without a spacesuit)? Discuss your ideas with your group.

vac·u·um

/ˈvakˌyo͞o(ə)m/

noun

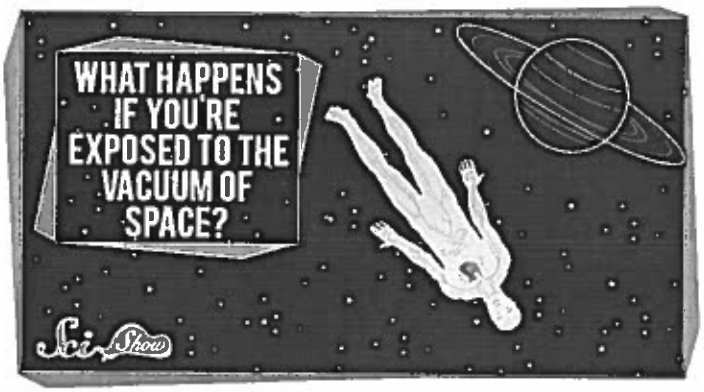
1. a space entirely devoid of matter.
   synonyms: emptiness, void, nothingness, vacancy, absence, black hole
   "people longing to fill the spiritual vacuum in their lives"

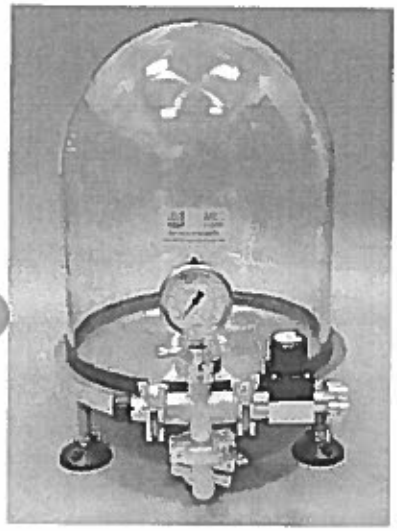
Guiding Question: Is a vacuum a medium?

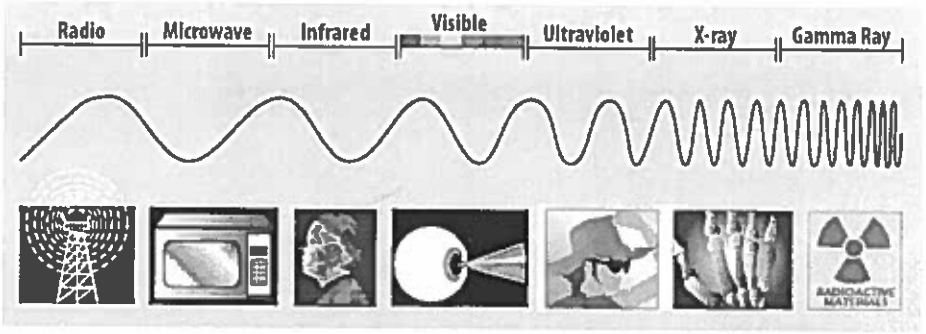
WHAT IS A VACUUM?

A vacuum is an area in with little or no matter of any kind. In a vacuum, there are incredibly small amounts of molecules, atoms, or particles. A complete and absolute vacuum does not exist in nature. However, the emptiness of deep space and the universe come very close to a perfect vacuum with only tiny amounts of hydrogen atoms.

We can create vacuums in the laboratory by completely removing gas molecules from an airtight container using a vacuum pump (see image to the left). All **electromagnetic waves**, such as those shown in the image below, do not need a medium or matter to travel and can travel through a vacuum.







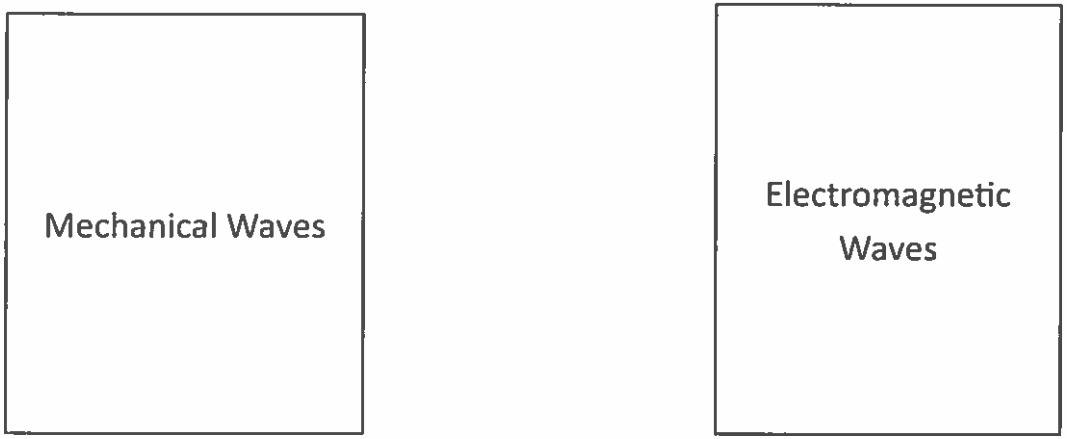
VACUUM (SPACE)
↓
NO MATTER
↓
SOUND CANNOT TRAVEL

In a vacuum, there is not enough matter or particles to vibrate and help transport **mechanical waves**. Sound waves, like all mechanical waves, cannot travel through a vacuum or outer space because of the absence of a medium, or matter.

Guiding Question: Is a vacuum a medium?

Claims (your response to the question)	Evidence (Facts and information that supports your claim)

Double Bubble Thinking Map



8.3.3 - Resource Sheet

Waves Traveling Through Mediums

Focus Question: How does sound travel differently through a solid, liquid, gas or vacuum?

Sound waves are both **mechanical waves** and longitudinal waves and require a **medium** to travel through. When something makes a sound, the sound waves cause the molecules in matter to vibrate and bump into each other (see FIGURE 1). Sound waves, like all mechanical waves, need to travel through a medium such as a solid, liquid, or gas. The sound waves move through each of these mediums by vibrating from molecule to molecule through the matter (see FIGURE 2). Because molecules are spaced differently between solids, liquids, and gases, sound travels through each state of matter at a different speed.

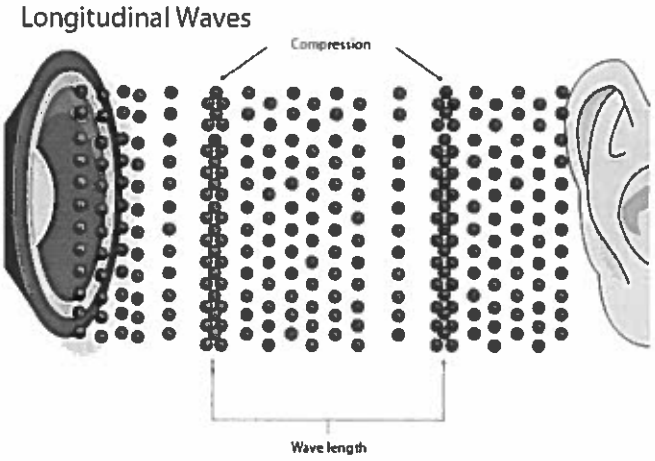


FIGURE 1

FIGURE 2

Sound Waves in a SOLID

The atoms or molecules in a solid are packed very tightly together, almost touching each other and remain in place. Since these particles are bonded tightly together, a sound wave moving from one solid molecule immediately transfers the sound wave to the next molecule touching it. Because there are no gaps between molecules, sound waves can travel very quickly from molecule to molecule in a solid without losing energy.

Sound Waves in a LIQUID

In a liquid, the atoms or molecules are touching each other, but they are not fastened to each other as strongly as they are in a solid. When sound waves travel through a liquid, some of sound's energy is

wasted pushing the particles around because they can slide past each other. Sound cannot travel across gaps between molecules, which can slow a sound wave down. Sound travels about four times faster and farther in water (liquid) than it does in air (gas).

Sound Waves in a GAS

In a gas (example: air), the molecules are far apart. For sound to travel through a gas, the molecules must move quite a distance before they collide with other molecules. Sound energy cannot move as quickly when the molecules are not in contact with each other. Sound waves travel about thirteen times faster in wood (solid), than air (gas).

Sound Waves in a VACUUM

Sound travels by vibrating the particles in the medium so that they bump into each other. In a vacuum, there are very, very few particles to vibrate, so sound cannot travel.

Electromagnetic Waves in a VACUUM

How can we communicate with astronauts orbiting earth if sound waves cannot travel through space? We use radio waves. Radio waves travel through a vacuum because they are electromagnetic waves, and do not need a medium to travel. We can see light traveling through the space because light waves are also electromagnetic.

Focus Question:

1) How does sound travel differently through a solid, liquid, gas, or vacuum?

Apply Your Knowledge:

2) Dolphins and whales communicate through great distances underwater. How is this possible?

3) Native Americans who lived on the Great Plains used to put an ear on the ground to tell if buffalo or horses were coming. Why didn't they listen through the air?

4) Is FIGURE 3 scientifically accurate? Explain.

Advanced Concepts:

5) Would you expect sound waves to move faster on a hot day or a cold day? Explain your reasoning.

8.3.3 Task Card - Modeling Sound Through Different Mediums

Guiding Question: How do sound waves travel through different mediums?

Task: Design a colorful chart, table, or foldable to model the difference between sound waves traveling through a solid, liquid, gas, and vacuum. Follow the checklist below:

- ❑ Draw and label a solid, liquid, gas, and vacuum.
- ❑ Draw and label the molecules in each medium.
- ❑ Draw the sound waves moving through each medium.
- ❑ Annotate and explain your models so they tell a story and educate.
- ❑ Use color and be creative!
- ❑ Fill the entire page.

8.3.3 Task Card - Modeling Sound Through Different Mediums

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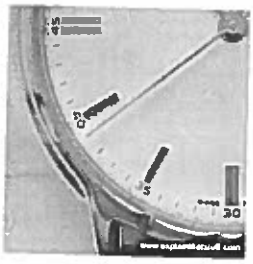
- ❑ Annotate and explain your models so they tell a story and educate.
- ❑ Use color and be creative!
- ❑ Fill the entire page.

8.3.3 1 SAUSD SCIENCE ADAPTED FROM OUSD

FOCUS QUESTION: *What are the advantages and disadvantages of using digital signals instead of analog to transmit information?*

ANALOG AND DIGITAL TECHNOLOGY: WHICH IS BETTER?

Introduction:



Back in the late 1970s, one of the most exciting things you could own was a **digital watch**. Instead of trying to figure out the time from slowly rotating hands, as you had to do with an old-style **analog watch** (FIGURE 1), you simply read the numbers off a digital display. Since then, we've got more used to the idea of **DIGITAL TECHNOLOGY**. Now pretty much everything seems to be digital, from television and radio to music players, cameras, cell phones, and even books. What's the difference between analog and digital technology? Which is best? Let's take a closer look!

*1.Based on this paragraph, what do you think is the difference between **analog and digital?***

_____

_____

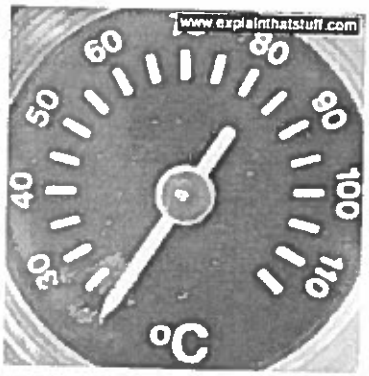
_____

_____

_____

Section #1:

What is ANALOG technology?



An **analog watch** tells time with two hands that sweep around a dial (the middle) The position of the hands is a *measurement* of the time. How much the hands move is directly related to what time it is. These movements are a way of *representing* passing time.

*It's not the same thing as time itself: it's a representation or an **analogy** of time.* That's really what the term ANALOG means: representation / analogy.

*2. "It's not the same thing as time itself: it's a representation or an **analogy** of time."*

*Based on this sentence, what do you think **analog** means?*

_____

_____

_____

_____

***FOCUS QUESTION**: What are the advantages and disadvantages of using digital signals instead of analog to transmit information?*

ANALOG INFORMATION

Often when we say something is **analog**, the information it handles **doesn't involve processing numbers electronically**. An **old-style film camera** is sometimes referred to as an example of *analog technology*. It captures an image on a piece of transparent plastic "film" coated with chemicals, which react to light. When the film is developed (chemically processed in a lab), you are left with **a representation of the scene you photographed**. In other words, the picture is an *analogy (representation)* of the scene you wanted to record.

The same is true of recording sounds with a cassette recorder (old school tape recorder). The recording you make is a collection of magnetized areas on a long reel of plastic tape. Together, they represent an *analogy (representation)* of the sounds you originally heard.

3. Why is a printed picture from a film camera an example of an analog?

_____

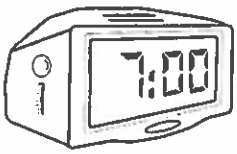
_____

_____

_____

Section #2:

What is digital technology?



DIGITAL technology is completely different. Instead of storing words, pictures, and sounds as **representations (analogies)** on things like plastic film or magnetic tape, we first convert the information into numbers (digits : digital) and then display and/or store the numbers.

4. Why is digital technology different than analog technology?

_____

_____

_____

_____

8.3.4 Digital vs Analog Reading

***FOCUS QUESTION**: What are the advantages and disadvantages of using digital signals instead of analog to transmit information?*

Many scientific instruments now measure things **digitally** (automatically showing readings) instead of using analog pointers and dials. Thermometers and bathroom scales are just a few of the common measuring devices that are now likely to give you an instant digital reading. **Digital** displays are generally quicker and easier to read than analog ones; whether they're more accurate depends on how the measurement is actually made and displayed.

5. Which is an example of analog technology? WHY??

6. Why do you think scientists prefer using digital tools rather than analog ones?

Digital Information

All kinds of everyday technology also works using digital rather than analog technology. Cell Phones, for example, transmit and receive calls by converting the sounds of a person's voice into numbers and then sending the numbers from one place to another in the form of radio waves. Used this way, **digital technology** has many advantages. It's easier to store information in digital form and it generally takes up less room. You'll need several shelves to store 400 vinyl, analog music records (analog technology) but with an

7. Are cell phones an example of digital or analog technology? WHY?

8. List the advantages of digital technology below:

FOCUS QUESTION: *What are the advantages and disadvantages of using digital signals instead of analog to transmit information?*

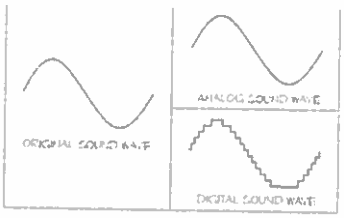
ipod (digital technology) you can put the same amount of music in your pocket! Digital information is generally more secure: cell phone conversations are encrypted before transmission—something easy to do when information is in numeric form to begin with.

Conclusion:

Which is better, analog or digital?

Just because **digital technology** has several advantages, **doesn't mean it's always better than analog.**

For example, an analog watch might be far more accurate than a digital one if it uses a high-precision movement (gears and springs) to measure time passing, and if it has a sweeping second hand it will represent the time *more precisely than a digital watch (digital watches only display the minutes and hours)*. Surprisingly, analog watches can also keep time better. Generally, the most expensive watches in the world are analog ones.



9. What example does the reading give to prove that digital technology ISN'T always better than analog technology? EXPLAIN.

How long will the information last?

One interesting question is whether information stored in digital form will last as long as analog information. Museums still have paper documents (and ones written on clay or stone) that

10. How do you think we can store / keep digital information? Remember that technology keeps changing so we need to store information in a way that it can ALWAYS be accessed.

***FOCUS QUESTION**: What are the advantages and disadvantages of using digital signals instead of analog to transmit information?*

are thousands of years old, but no-one has the first email or cell phone conversation. Open any book on the history of photography and you'll see reproductions of early photos. But you won't see any pictures of the first digital photo: even though it was much more recent, probably no-one knows what it was or who took it! Lots of people own and cherish plastic vinyl records that are decades old, but no-one attaches the same importance to disposable itunes music files.	

Write your ONE SENTENCE SUMMARY HERE (15-20 words): What was this article about?

FOCUS QUESTIONS

1. What does ANALOG mean? How would you use that information to explain the difference between ANALOG and DIGITAL?

2. You have a CD (what we used in computers in the late 90's / early 2000's, see picture). What are the advantages and disadvantages of that specific technology.

8.3.4 Digital vs Analog Reading

name: _____ per: _____

FOCUS QUESTION: *What are the advantages and disadvantages of using digital signals instead of analog to transmit information?*

Advantages

Digital	Analog

Disadvantages

Digital	Analog

Name _____ Period _____

8.3.4 Task Card - My Telephone

Focus Question: *What are the advantages of digital signals over analog signals?*

Introduction:

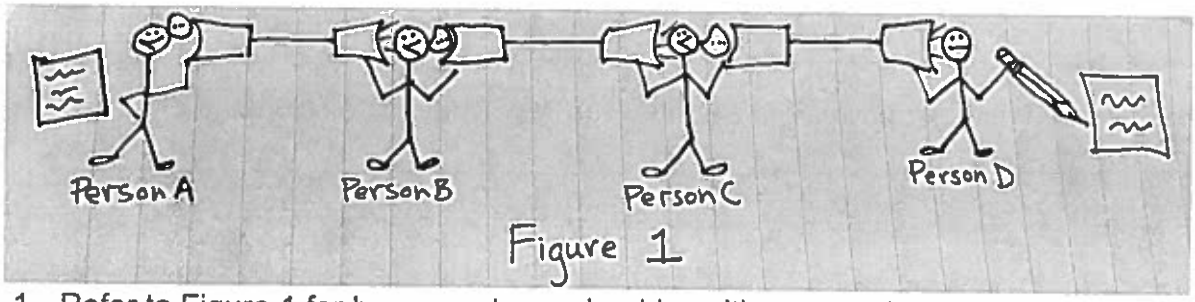
You and your team are going to send and receive messages using two different methods and the materials listed below.

Materials:

6-plastic cups
3-meters of string
rubbing alcohol and napkins

Part 1: Analog of an Analog

Figure 1:



1. Refer to Figure 1 for how your team should position yourselves. Make sure the string is tight between each person.
2. The teacher will give Person A three messages on a piece of paper.
3. Person A sends one of the messages (speaks into the cup) to Person B.
4. Person B repeats the message to Person C.
5. Person C repeats the message to Person D.
6. Person D writes down the message.
7. Repeat for the two other messages.
8. *Disinfect after use.*
9. Respond to the **Analysis Questions** in your science notebook.

Analysis Questions:

1. Could you hear your partner's message/or could they hear you? Why or why not?

Name _____ Period _____

8.3.4 Task Card - My Telephone

Focus Question: *What are the advantages of digital signals over analog signals?*

2. Would sound travel if the string was loose between persons? Why or why not?

3. Without trying it first, would the sound travel through the string if someone was holding the string? Why or why not?

Raise your hand to get teacher permission to move onto Part 2: Digital Encoding...

Part 2: Digital Encoding

Figure 2:

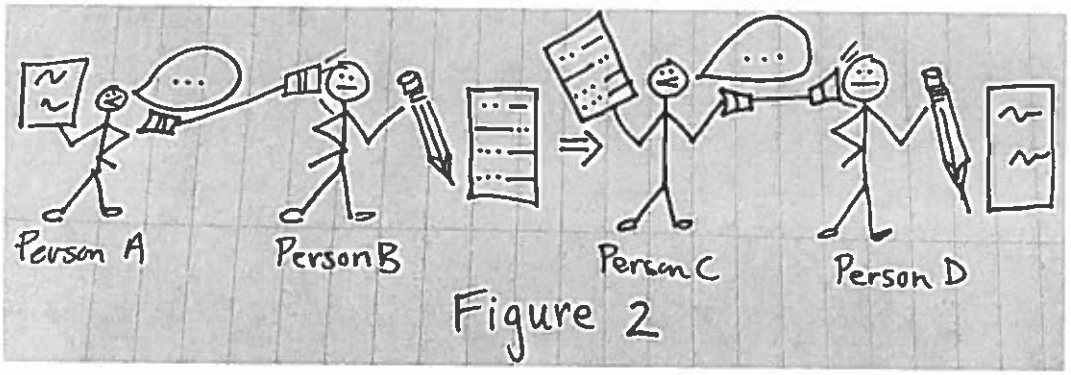


Figure 2

1. Refer to Figure 2 for how your team should position yourselves.
2. The teacher will give Person A 1 message on a piece of paper.
3. Person A sends the message (speaks into the cup) to Person B.
4. Person B **encodes** the message using Morse Code and **passes (hands)** it to Person C.
5. Person C **decodes** the message (using the Morse Code alphabet sheet) and then **sends** the message (speaks into the cup) to Person D.
6. Person D **writes down** the message in his / her notebook.
7. *Disinfect cups after use.*

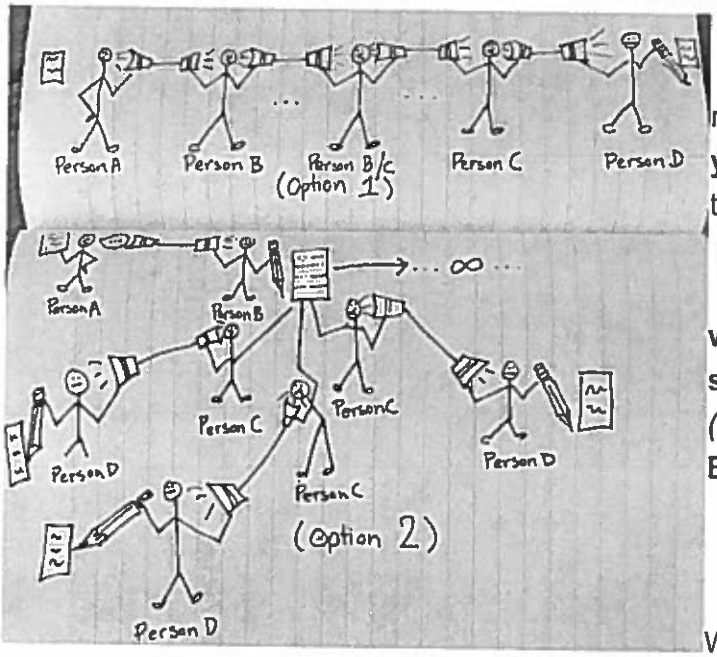
8.3.4 Task Card - My Telephone

Focus Question: *What are the advantages of digital signals over analog signals?*

8. As a group, discuss and respond to the Analysis Questions. Record your responses in your science notebook.

Analysis Questions:

Figure 3:



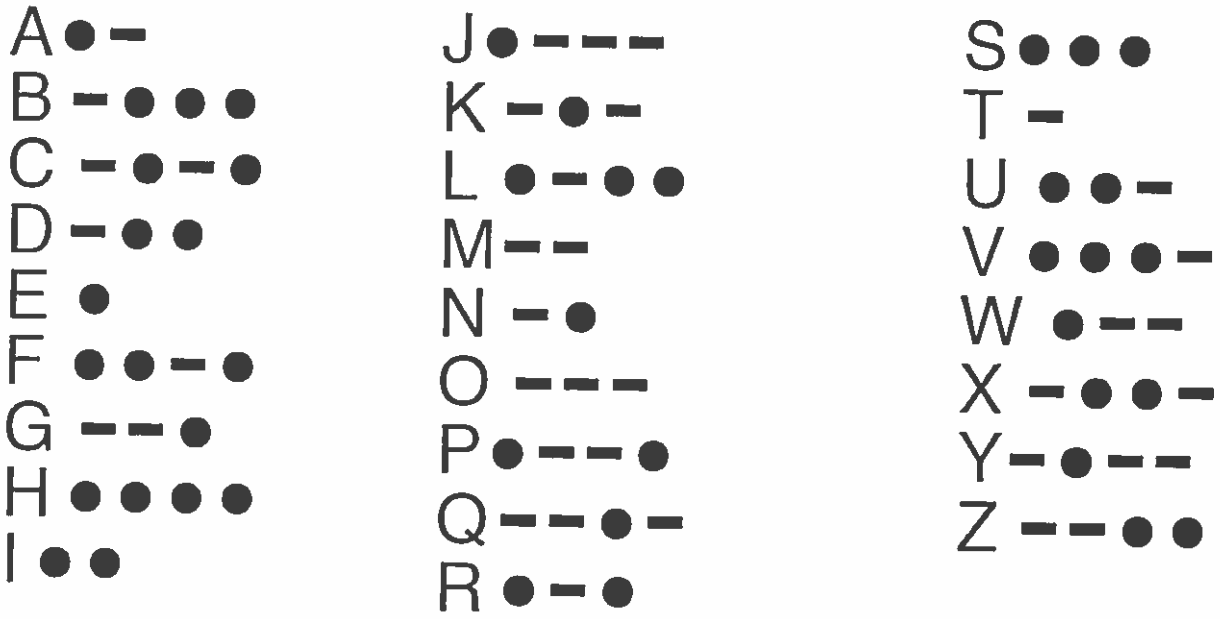
1. Which model is better at getting a message out, Analog or Digital? **Explain your answer.** Give 3 pieces of evidence from the BrainPop video, reading and activity.

2. If we were to expand these models, **which one would be more effective for sending a message to the whole class?** *(Refer to Figure 3)* **Explain your answer.**

What's happening?
Speaking into the cup creates sound waves which are converted into vibrations at the bottom of the cup. The vibrations travel along the string and are converted back into sound waves at the other end so your friend can hear what you said. Sound travels through the air but it travels even better through solids such as your cup and string, allowing you to hear sounds that might be too far away when traveling through the air.

More about phones:
Landline telephones feature microphones that convert sound waves into electric currents that are then sent through wires and converted back into sound waves by an earphone inside the telephone at the other end. Modern mobile phones use radio waves (part of the electromagnetic spectrum that includes microwaves, infrared, visible light, Xrays and others) to communicate with base stations located throughout telephone networks.
Phones have come a long way since Alexander Graham Bell was awarded the first electric telephone patent by the United States Patent and Trademark Office back in 1876. Today's cell phones are a marvel of modern technology, featuring not only the ability to make phone calls but to also surf the web, play music, view documents and much more.

Use the following to encode and decode the message:



A "DAH" is a line
A "DIT" is a dot

Example the letter "A" would be " DIT DAH"

8.3.S Output Sheet #1: Musical Instruments

Focus Question: *How do sound waves the create different tones of various musical instruments.*

Directions: Complete this output sheet **individually.** Using your knowledge of sound waves as scientific evidence, respond to the following questions. You may use your science notebook as a reference.

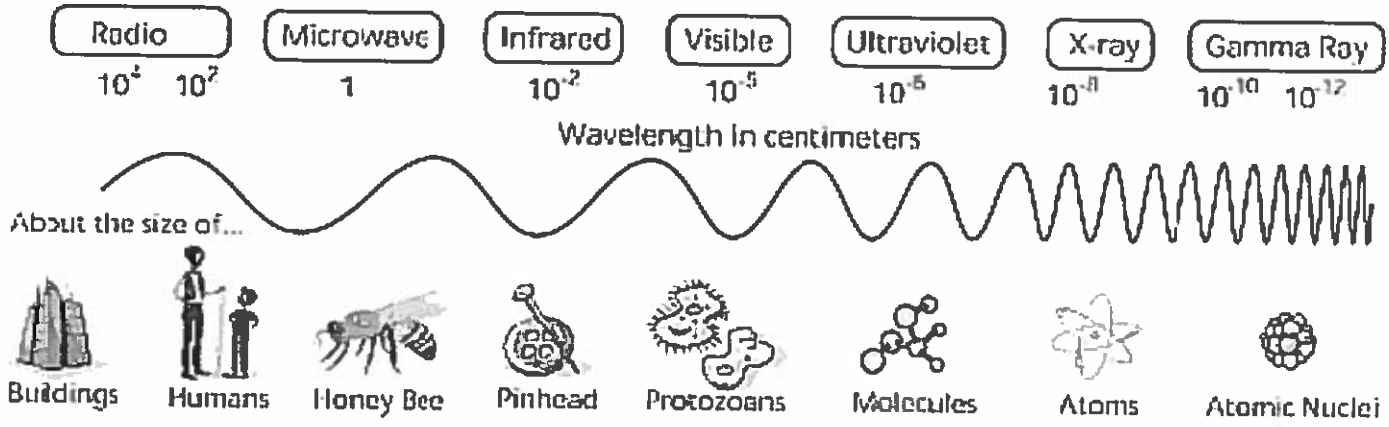
1. What equipment will you use to create your instruments? Why did you choose these materials? *Use scientific evidence about sound to explain your materials.*

2. Draw a diagram your instrument, annotating the wave lengths and types that will be produced

Lathrop Intermediate

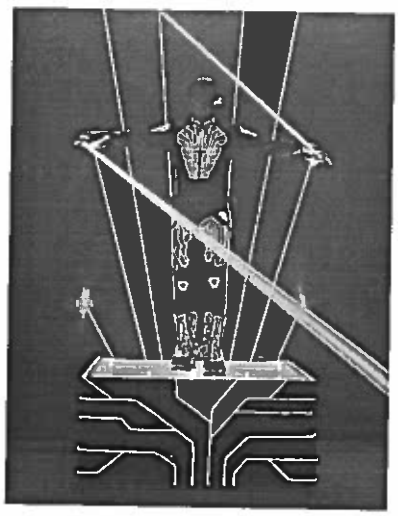
8th grade Science

Waves (Electromagnetic Spectrum) Unit



Warm Up:

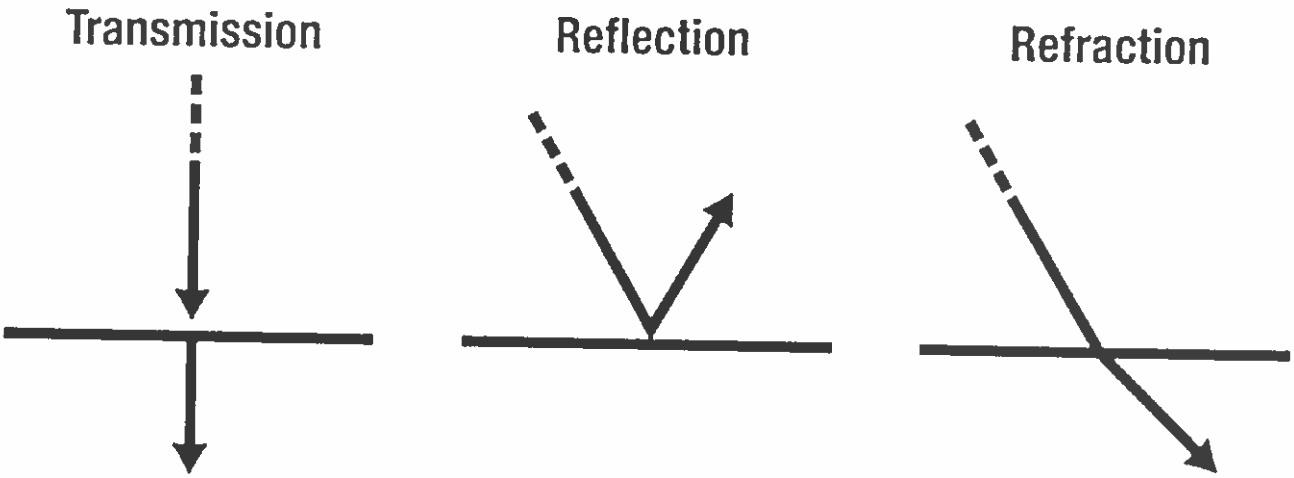
1. Record the following question in your science notebook: **How did the lasers (light) move and change their movement?**
2. You are about to watch a music video of the performer "Laserman." Pay close attention to the lasers as you watch. After the video, describe **how** the lasers moved and changed in their movement.



PART ONE: Modeling a Ray Diagram

A **ray diagram** is a diagram that traces the path that light takes in order for a person to view a point on the image of an object. On the diagram, rays (lines with arrows) are drawn for the incident ray and the reflected ray.

1) Sketch a full page model in your notebook illustrating and naming the 3 light wave behaviors shown below.
2) *Annotate* to explain **what you think is happening** to the light rays in the model.
3) Label your model.
4) Do not worry about being correct, just practice making sense of these light behaviors on your own. We will continue to add more information to these models as more information is collected.



PART TWO : Evidence Based Claims

Focus Question: *Are these images illustrating light wave transmission, reflection, or refraction?*

Instructions:

1. Your teacher will display 6 different images.
2. You will have **2 minutes** for each image to discuss in your table groups if the image shown is an example of *transmission, reflection, or refraction* and provide evidence to support your claim.
3. Record your claims and evidence in a data table in your notebook.

Preparing for the Activity:

Design a data table to organize the claims and evidence for this activity. Create this data table in your science notebook.

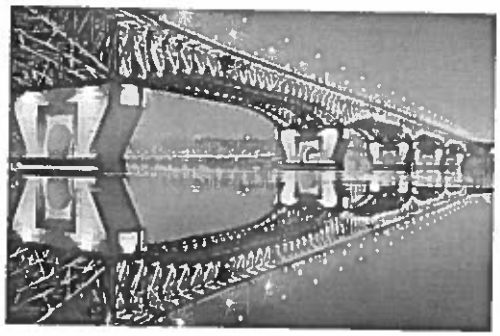
Include the following categories in your data table:

1) IMAGE: Include the number and a short description of the image

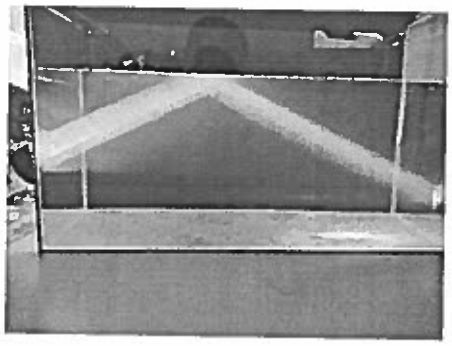
2) VOCABULARY: Write the word that best describes the image: reflection, refraction, or transmission.

3) EVIDENCE: What evidence can you provide that supports your vocabulary choice?

#1

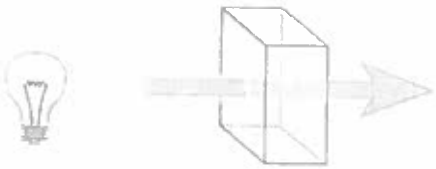


#2

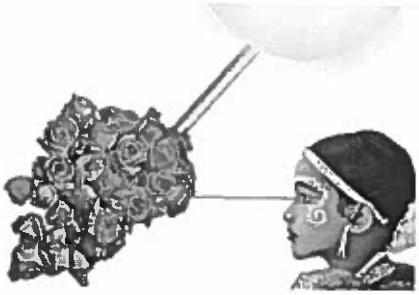


#3

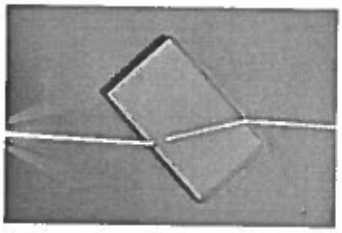
#4



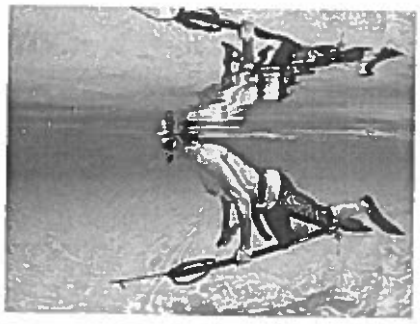
#5



#6 -



#7

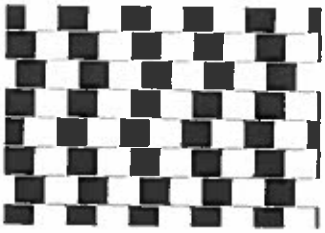


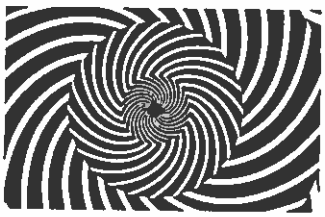
8.4.0 table

Image Number	Vocabulary	Evidence
1		
2		
3		
4		
5		
6		
7		

LAB MATERIALS (per group):

- 2 clear glasses, beakers, or jars
- 2 pennies
- 1 pitcher, or measuring cup (for pouring water)
- 1 dropper
- 1 pencil
- 1 directional arrow sheet
- 1 stripe sheet





INSTRUCTIONS:

1) Work on one test at a time.
2) Read over the procedure carefully for each test.
3) **Rewrite the procedure** in your notebook as a **visual procedure** by sketching/drawing each step and labeling the equipment.
4) Construct a full page model in your notebook illustrating your observations for each test. Follow the rubric guidelines below for your model:

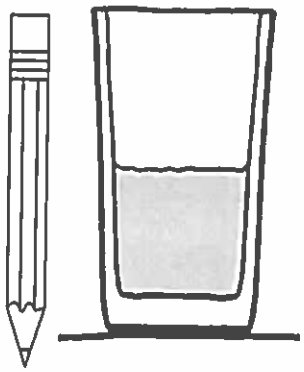
Model Rubric Guidelines: (Full page in notebook)	**Points Possible**	**Self Score**	**Teacher Score**
❑ Label all key features of the system			
❑ Describe relationships between the parts of the system in depth			
❑ Explain how light waves behave and move through the system using unit vocabulary and scientific concepts			
Group Work:	**Points Possible**	**Self Score**	**Teacher Score**
❑ All members demonstrate respectful, safe, and positive behavior			
❑ The group remains focused and uses class time wisely			
❑ All members contribute ideas, participate, and divide up the lab work evenly			

Focus Question: *How does light behave?*

Test #1 - The Coin Trick

1) Place a coin on the table and place the first glass on top of the coin.
2) Place the coin inside the second glass.
3) Fill both glasses with equal amounts of water.
4) Look at both glasses from many different angles. Record your observations.
5) Now lift the first glass.
6) Use the dropper to place a few drops of water on the coin before placing the glass back on top of the coin.
7) Record all observations in a full page model according to the rubric provided.
8) Annotate your model by answering the following question: "What do you believe is the scientific reason for these observations"?

Test #2 - Broken Pencil

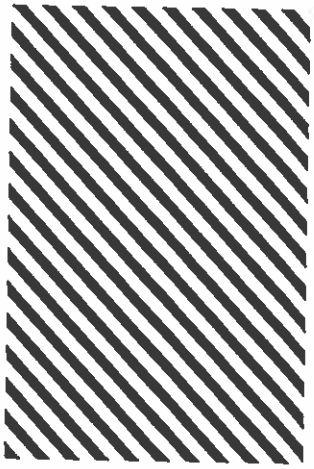


1) Fill one of the glasses halfway with water.
2) Insert a pencil in the glass and water.
3) Hold the pencil straight up in the center of the glass of water and look at the system from the top and side.
4) Record your observations.
5) Let the pencil rest against the side of the glass at an angle. Look at the pencil from the top and side.
6) Record your observations.
7) Hold the pencil straight up in the glass, but to the left of the center. Look at the pencil from the top and the side.
8) Record all observations in a full page model according to the rubric provided.
9) Annotate your model by answering the following question: "What do you believe is the scientific reason for these observations"?

Test #3 - Directional Arrows

1) Stand the arrow sheet up behind one empty, clear glass.
2) Begin to fill the glass a little past the first arrow only.
3) Record observations of the system.
4) Fill the glass past the second arrow.
5) Record observations of the system.
6) Slide the glass side to side, to the left and right of the arrows.
7) Record all observations in a full page model according to the rubric provided.
8) Annotate your model by answering the following question: "What do you believe is the scientific reason for these observations"?

Test #4 - Watery Stripes



1) Stand the stripe sheet up behind one empty, clear glass.
2) Fill the glass halfway with water.
3) Record observations of the system.
4) Fill the glass with water.
5) Record observations of the system.
6) Slide the glass side to side.
7) Record all observations in a full page model according to the rubric provided.
8) Annotate your model by answering the following question: "What do you believe is the scientific reason for these observations"?

Analysis and Conclusions:

1. Examine the results of all four tests. As light travels through the glass, the water, and through the air to your eyes, what did you observe happening to the light waves in each of the tests?

2. Write a conclusion that explains what you have learned about the behavior of light as it passes from one medium to another.

8.4.1 Task Card: Light Exploration

Focus Question: *How does light behave through mediums of different clarity (clearness)?*

Task: You and your group are going to investigate how light behaves when it interacts with materials of different clarity (clearness). You will record written observations and diagrams to help you respond to the Focus Question: How does light behave through mediums of different clarity (clearness)? After the investigation, you will construct a simple model comparing and explaining how light behaves through three mediums of different clarity.

Materials:

- Laser
- 3 different cups
- 3 types of paper
- Optics board

Task Steps:

1) Copy the Data Table shown below into your science notebook.

Material Name and describe the material you are testing	**Observation** (2+ sentences) Is the light transmitted or absorbed? Describe in what you see in detail	**Diagram** Include all parts of the system and labels
1. 2. 3. 4. 5. 6.		

2) **Start** with the three different types of paper.
3) One at a time, hold each type of paper on the Optics Board at the blue line.
4) Shine the laser light at each type of paper.
5) *Record* your observations and *sketch* a labeled diagram on your Data Table for each type of paper. Make sure your observations are detail and describe everything that you observe happening.

6) **Next**, you are going to test the three types of cups.
7) One at a time, place each type of cup on the Optics Board at the blue line. **Make sure your cup is placed on its side, with the bottom of the cup facing the laser.**
8) Shine the laser light at each cup.
9) *Record* your observations and *sketch* a labeled diagram on your Data Table for each type of cup.

10) Complete the following **Reflection Questions.** Record your responses in your notebook under the Data Table.

a) *Which materials behaved the same when light (the laser) hit them? How did they behave the same?*
b) *What is the pattern you notice between how clear a medium (material) is and how light behaves?*

11) As a group, read the vocabulary terms below outloud.

12) Revisit your Data Table and include these vocabulary terms to your observations. *Identify how the light behaved as it hit each type of medium?*

Light Behavior Vocabulary

Transmission: The action or process of transmitting something or the state of being transmitted (light **passes through**)

Absorption: When light hits a surface some of its color is absorbed (**taken in**) : light does not pass through

Refraction: An effect that occurs when light **bends** as it passes from one surface into another

Reflection: An effect that occurs when light hits smooth, shiny surfaces. The light changes direction and a minor image is reflected (light bounces off a surface).

Scattering: An effect that occurs when light rays are dispersed or spread : the light ray is no longer perfectly straight and/or in some cases, the same size as the starting ray (incident ray)

13) Construct a simple model **comparing** and **explaining** how light behaves through mediums (materials) of different clarity. **You model should include:**

- Three types of mediums (materials) of different clarity (clearness)
- Light rays (before and after hitting the materials)
- Labels
- Explanations describing how the light is behaving
- Vocabulary terms from the Light Behavior Vocabulary List

8.4.1 table

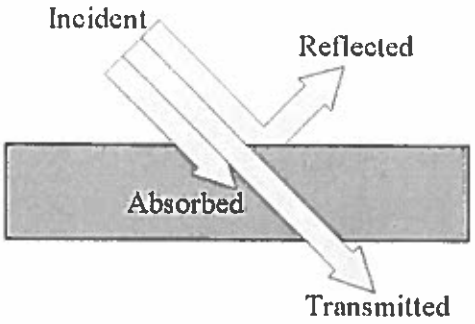
Material - Name and describe the material you are testing	Observation (2+ Sentences) - Is the light transmitted or absorbed? Describe what you see in detail.	Diagram - include all parts of the system and labels
1		
2		
3		
4		
5		
6		

8.4.1 Reflection Questions

Focus Question: *How is the absorption, transmission, and reflection of light affected by the color of the object?*

Task:

Today you will test color filters to ***compare how different light colors are absorbed, transmitted, or reflected by different paper colors.*** Color filters absorb certain wavelengths of color and transmit the other wavelengths. A blue color filter will transmit blue light, and absorb all other colors. You will test how a white, red, green, and blue light are absorbed, transmitted or reflected by white, red, green, and blue paper.



Materials:

- 1 light & optics table
- 1 power source
- 3 bright white LED modules
- 4 filters (red, blue, green, and clear)
- 1 each of white, red, blue, and green construction paper

Procedure:

1. ***You will be testing how a white, red, green, and blue light are absorbed, transmitted, or reflected by white, red, green, and blue paper.*** Discuss data table designs with your group and brainstorm ideas in your notebook.

2. Create a final draft data table in your notebook to organize your observations during the investigation. **Have your teacher approve your data table before moving on.**

3. Darken the room (and your group's space) as much as possible and collect your materials.

4. Turn on the **white light** and aim it at the **white paper**. Observe and record the color of the paper along with how the light behaves in the data table.

5. One by one, shine the **white light** at the **red, blue, and then green** pieces of paper. For each test, observe and record the color of the paper along with how the light behaves.

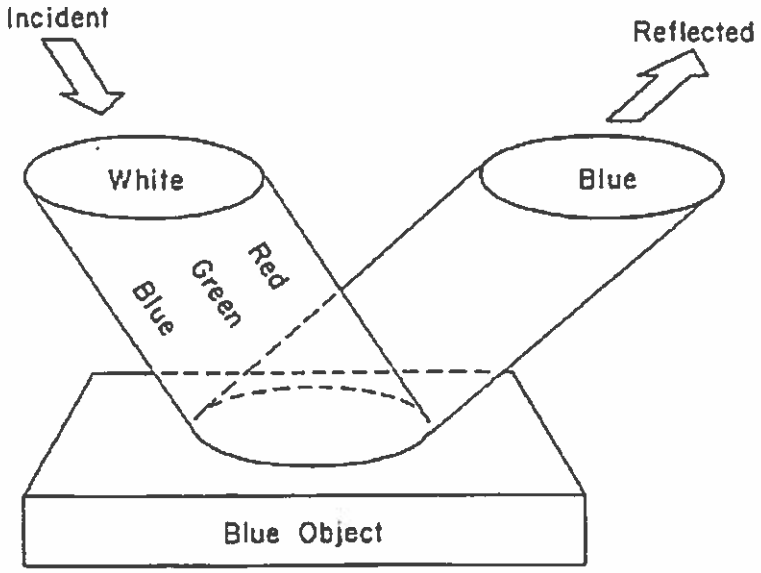
6. Take turns shining the light with the **red filter** at the **white, red, blue, and then green** sheets of paper. Observe and record the paper color and how the light behaves with each test.

7. Repeat **Step 6** using the **blue filter**, and then the **green filter**. After each test, record your observations.

Focus Question: *How is the absorption, transmission, and reflection of light affected by the color of the object?*

Analysis and Conclusion Questions:

1) Study the model below and compare it to your data. Are the results from your investigation illustrated by this model? Explain.



2) Re-create and annotate a similar model to the one shown above in your notebook illustrating your experimental results for ***shining an incident red light on a blue sheet of paper.*** Use the vocabulary words **incident, reflected, transmitted,** and **absorbed** in your response.

3) What do you predict will happen when a red light shines on a green shirt? **Draw and annotate a model to explain your claim.**

8.4.1 Task Card: Convex and Concave Mirrors and Lenses

Focus Question:How does light behave when it hits a convex/concave lens vs. a convex/concave mirror?

Task: You are going to observe and gather data from two sources to compare the behavior of light when it hits a convex/concave lens vs. a convex/concave mirror. Using these two sources, you are going to construct a model illustrating and explaining your response to the **focus question.**

Task Steps:

1. Rewrite the **focus question** in your science notebook.
2. Design a Data Table that allows you to gather information about convex and concave **mirrors** AND **lenses**. Place your Data Table under the focus question you just recorded in your notebook.
3. Be prepared to add evidence to your Data Table during each activity. Your evidence should include *written explanations* along with *sketches / diagrams.*

Part 1: Convex vs Concave Mirrors Video

1. Watch the following video: Convex vs. Concave Mirrors. **Note: This video is about mirrors, not lenses.**

2. Gather evidence to help you respond to the focus question: **How does light behave when it hits a convex/concave lens vs. a convex/concave mirror?**
    a. Remember you are eventually going to construct a model. Make sure you add quick sketches / diagrams along with your evidence

3. Once you have watched the video, pair / share the evidence you gathered with your partner. **Add to your evidence** if your partner has a great idea that you do not already have.

Part 2: Online Exploration:

1. Once you have received and logged onto a Chromebook, open the internet and type in the following web address: http://ca.pbslearningmedia.org/asset/lsps07_int_refractdemo/

2. Play the **Convex Lens Video** and then the **Concave Lens Video**. While you are watching each video, gather and record evidence on your Data Table. Remember to include sketches / diagrams.

3. Move onto Part 3 when you have finished watching the videos and collecting evidence on your Data Table.

Part 3: Constructing a Model

1. Using the evidence you have gathered, construct a model responding to the focus question: **How does light behave when it hits a convex/concave lens vs. a convex/concave mirror?**

    a. Your model should include clear and detailed labels, explanations, and diagrams that respond to the focus question.

    b. You may work with your partner while constructing your model.

Convex

Concave

Mirrors

Lens

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8.4.2 Resource Sheet

Visible Light Spectrum

Focus Question: *What does the color of a visible light wave tell us?*

Is visible light a form of radiation?

Radiation is energy that comes from a source and travels through a medium or through space. Mechanical waves like water, seismic, and sound waves radiate energy. All electromagnetic waves like radio, visible light, and x-rays are also various forms of radiation. The section of the electromagnetic spectrum that can be seen and detected by the human eye is the visible light spectrum (see **FIGURE 1**).

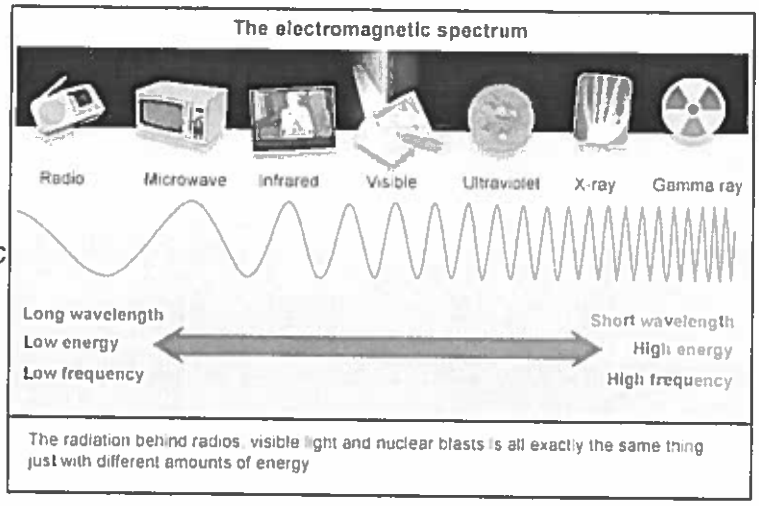

FIGURE 1

What is white light?

White light is the name given to what the human eye sees when all the colors that make up the visible spectrum are combined. The visible light spectrum is made up of red, orange, yellow, green, blue, indigo, and violet light, and these colors combine to make white light. In 1665, Isaac Newton discovered that a prism bends white light into the separate colors of the visible light spectrum (see **FIGURE 2**).

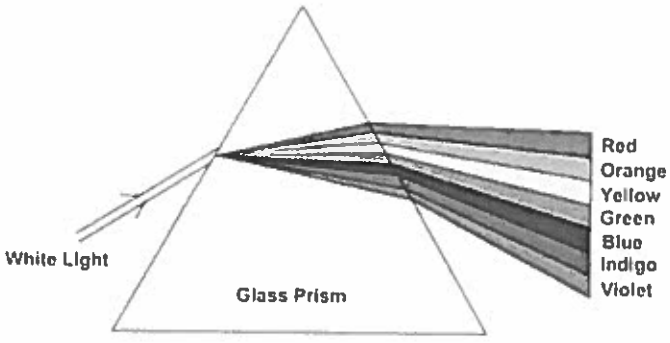

FIGURE 2

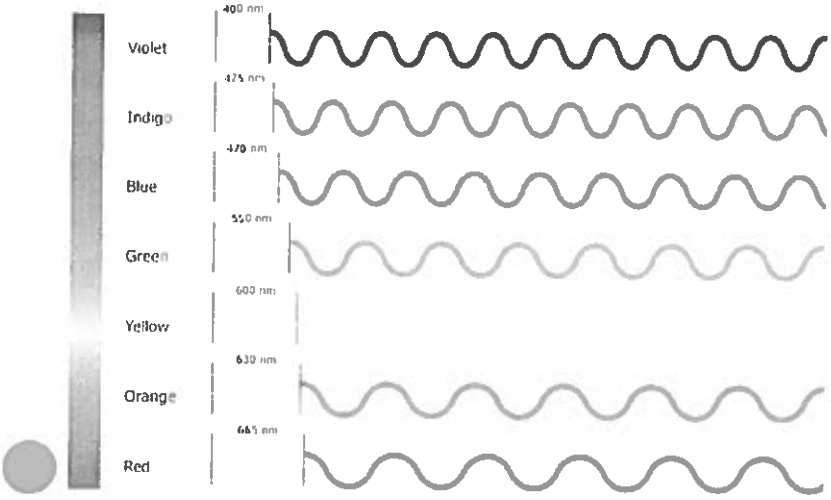

FIGURE 3

How is color related to energy?

Each color of the rainbow bends at a slightly different angle depending on its unique wavelength. The longer the wavelength, the lower the energy, the shorter the wavelength, the higher the energy. Violet light has the shortest wavelength, high energy, and bends at the greatest angle. Red light has the longest wavelength, low energy, and bends at the smallest angle.

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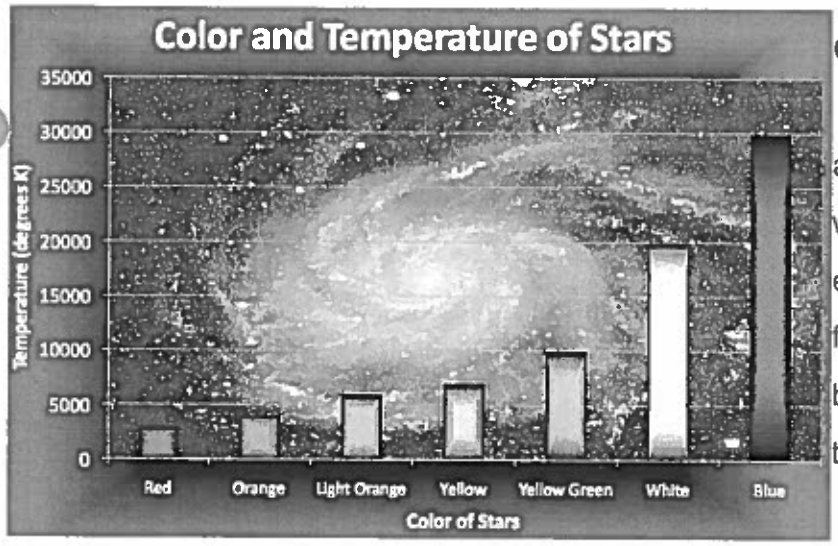


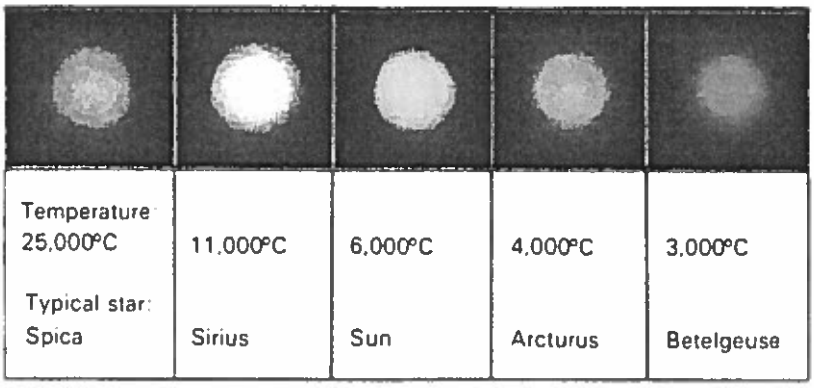
Color = Energy

As objects grow hotter, they gain energy and radiate shorter, more energetic wavelengths, changing color before your eyes. The flame color on a gas stove shifts from red to blue in color as it is adjusted to burn hotter. Study **FIGURE 4** to see how temperature is related to color.

FIGURE 4

What can a star's color teach us?

The color of stars tells scientists about their temperature. Our Sun produces more yellow light than any other color because its surface temperature is 5,500°C. If the Sun's surface were cooler, 3,000°C, it would look reddish, like the star Betelgeuse. If the Sun were hotter, 12,000°C, it would look blue, like the star Spica.



Temperature: 25,000°C Typical star: Spica	11,000°C Sirius	6,000°C Sun	4,000°C Arcturus	3,000°C Betelgeuse

FIGURE 5

Adapted From:
National Aeronautics and Space Administration, Science Mission Directorate. (2010). Visible Light. Retrieved February 27, 2015, from Mission:Science website:http://missionscience.nasa.gov/ems/09_visiblelight.html

Text Dependent Questions:

1. Review **FIGURE 1.** What radiation waves are you exposed to on a daily basis, and do you believe this level of radiation is safe? Explain your reasoning.
2. Create an annotated model comparing the energy, wavelength, and frequencies of x-rays and radio waves.
3. What does the color of a visible light wave tell us?

8.4.2 Task Card: Self Guided Tour of the Electromagnetic Spectrum

Focus Question: How does the Electromagnetic Spectrum play a role in my life?

Task: Using the Chromebooks, you and your partner are going to participate in a self-guided online tour of the Electromagnetic Spectrum. As you go through the "tour," you are going to add information on the Electromagnetic Spectrum you created during the Warm Up.

Task Steps:

1. Log onto the Chromebook, open an internet tab, and type in the following web address: http://www-tc.pbs.org/wgbh/nova/gamma/media/spectrum.swf

2. Read / go through the self guided tour with your partner.

3. Add information to your Electromagnetic Spectrum:
    a. The information you add should include written descriptions AND diagrams for each type of radiation

4. Rewrite and respond to the following questions in your science notebook:

    1. Which type of radiation (on the Electromagnetic Spectrum) do you think is the MOST harmful to humans? Provide evidence from the self-guided tour, videos, and/or readings.

    2. *How do radio waves differ from gramma waves?* Construct a model illustrating and explaining the differences between these two types of waves. INCLUDE the following terms in your model: **frequency, wavelength, and energy.**

8.4.2 Challenge Task Card

Focus Question: How are rainbows created?

Task:

1. Using your knowledge of light behavior, respond to the following phenomena question: **How are rainbows created?** CLUE: Use the Prism Video projected on the board as a reference / starting point.

2. In your science notebook, construct a mini model illustrating and explaining how you think rainbows are created. Use your science notebooks as a reference.

Task Card: Laser Alarm System

Focus Question: *How can we use our knowledge of light behavior to design and test a laser alarm system that could protect the world's largest diamond?*

Storyline:

You are a security consultant for the world's most renowned security company. Your team has been hired to design and construct a laser alarm system to protect the world's largest, most valuable diamond.

Constraints:

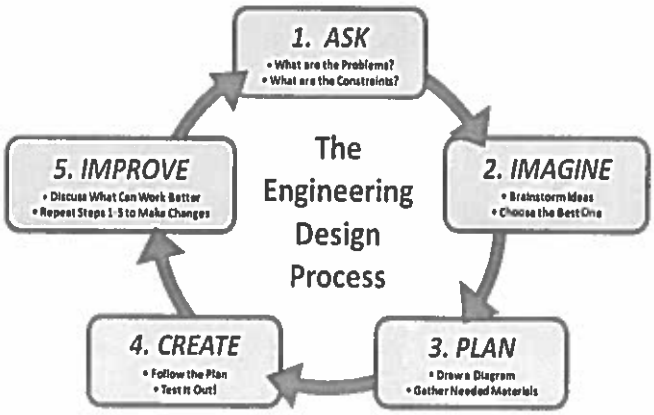
Your laser must be reflected, refracted, and transmitted through different mediums and begin and end at the same location, landing on a small bullseye target at the end of the course. The diamond you are protecting is located in the center of the bank vault. Your laser must provide 360 degree coverage around the diamond (you want to protect the diamond from every angle). You will design a 2 page spread in your notebook illustrating your laser alarm system, AND you will construct a mini 3-D model of your laser alarm design using the light optics kits.

Materials Available:

- Laser
- Convex lenses (2 small, 1 large)
- Prism
- Mirror
- Materials from home (get teacher approved)
- Glass with water
- Optics table
- Object that represents the diamond
- Bullseye

Project Steps:

1) With your group, review the materials available for your light obstacle course.
2) Brainstorm ideas with your group: How can you design your laser alarm system to fully protect the diamond?
3) In your notebook, construct a 2 page spread of your security alarm prototype. Use arrows to predict light behavior.
4) Test your prototype model and annotate all changes and revisions.
5) Annotate your prototype model to explain key features, relationships between parts, vocabulary, limitations, and revisions
6) Create a final, mini 3-D model of your laser alarm system.



Adapted from http://www.photonics.com/Article.aspx?AID=52252

Name: _____ Period: ____ Date: _____

8.4.S Laser Alarm System: Final Individual Reflection

Focus Question: How does light behave?

Directions: Read each of the following questions carefully. Respond to each question using the knowledge you have acquired throughout the Light Unit. You may use your science notebook as a reference.

1. Draw a model of the set up for your laser alarm system.

Name: _____ Period: ____ Date: _____

8.4.S Laser Alarm System: Final Individual Reflection

Focus Question: How does light behave?

Directions: Read each of the following questions carefully. Respond to each question using the knowledge you have acquired throughout the Light Unit. You may use your science notebook as a reference.

1. You used a laser as your light source for your alarm system model. Using the knowledge you have acquired from this unit and with as much scientific detail as possible, describe how light travels.

2. In the space provided below, sketch a simple wave diagram. Label the following parts: **wavelength, amplitude, crest,** and **trough.**

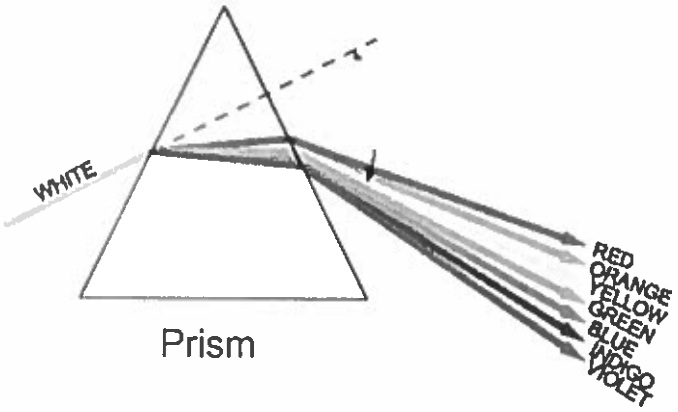
3. Define **frequency** and describe how it relates to light.

4. What would happen to your laser if the frequency of the wave was dramatically increased?

5. List and define the four major types of light behavior.

6. Which types of light behavior did you observe while constructing your laser alarm system? Describe one example for each type of light behavior on your laser alarm system.

7. Describe what is happening in the diagram below. Use at least 2 vocabulary words from the Word Box.



Prism

Word Box

Reflection
Refraction
Transmission
Frequency
Visible light
Wavelength
Light wave

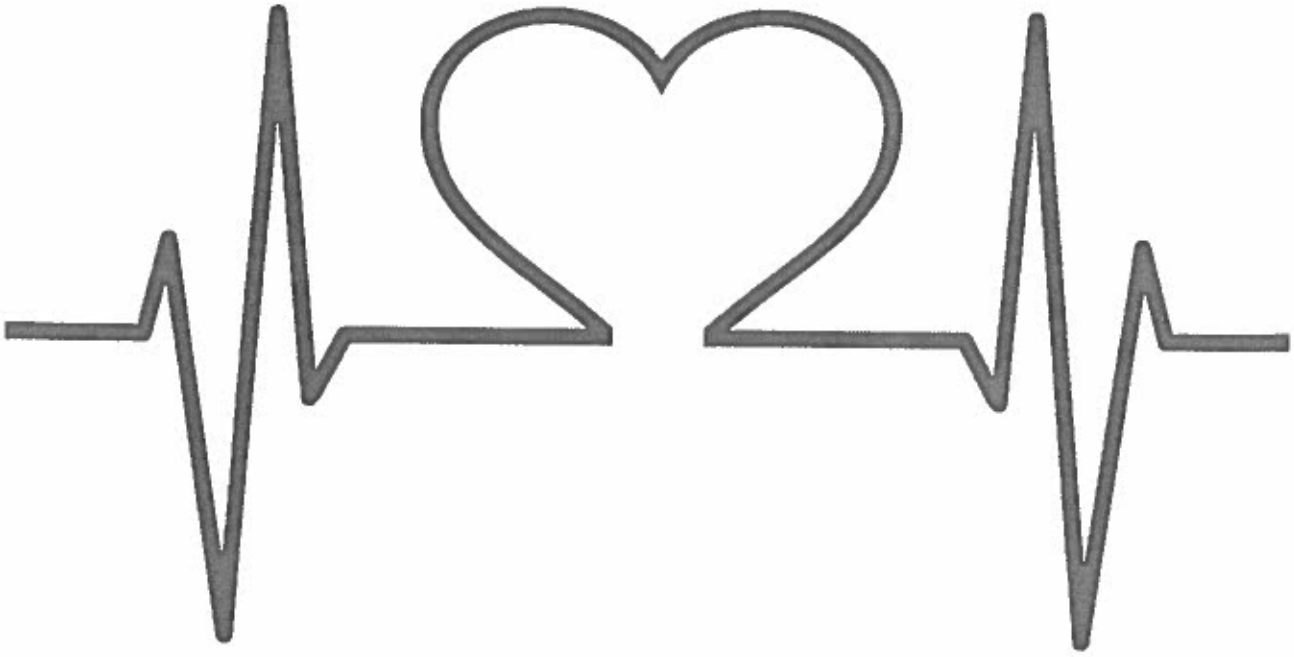
Name: _____ Period: ____ Date: _____

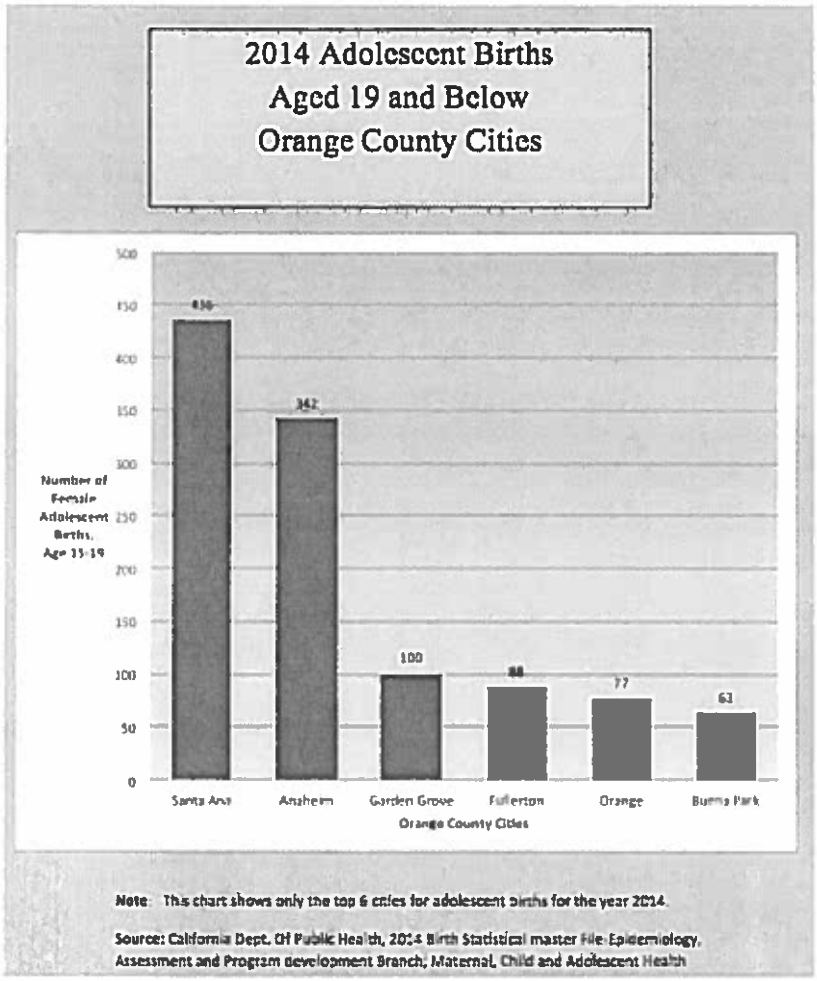
8. Construct a model to **illustrate** and **explain** what happens when light rays from the sun hit a convex magnifying glass lens. Use scientific vocabulary from this Light Unit.

Lathrop Intermediate

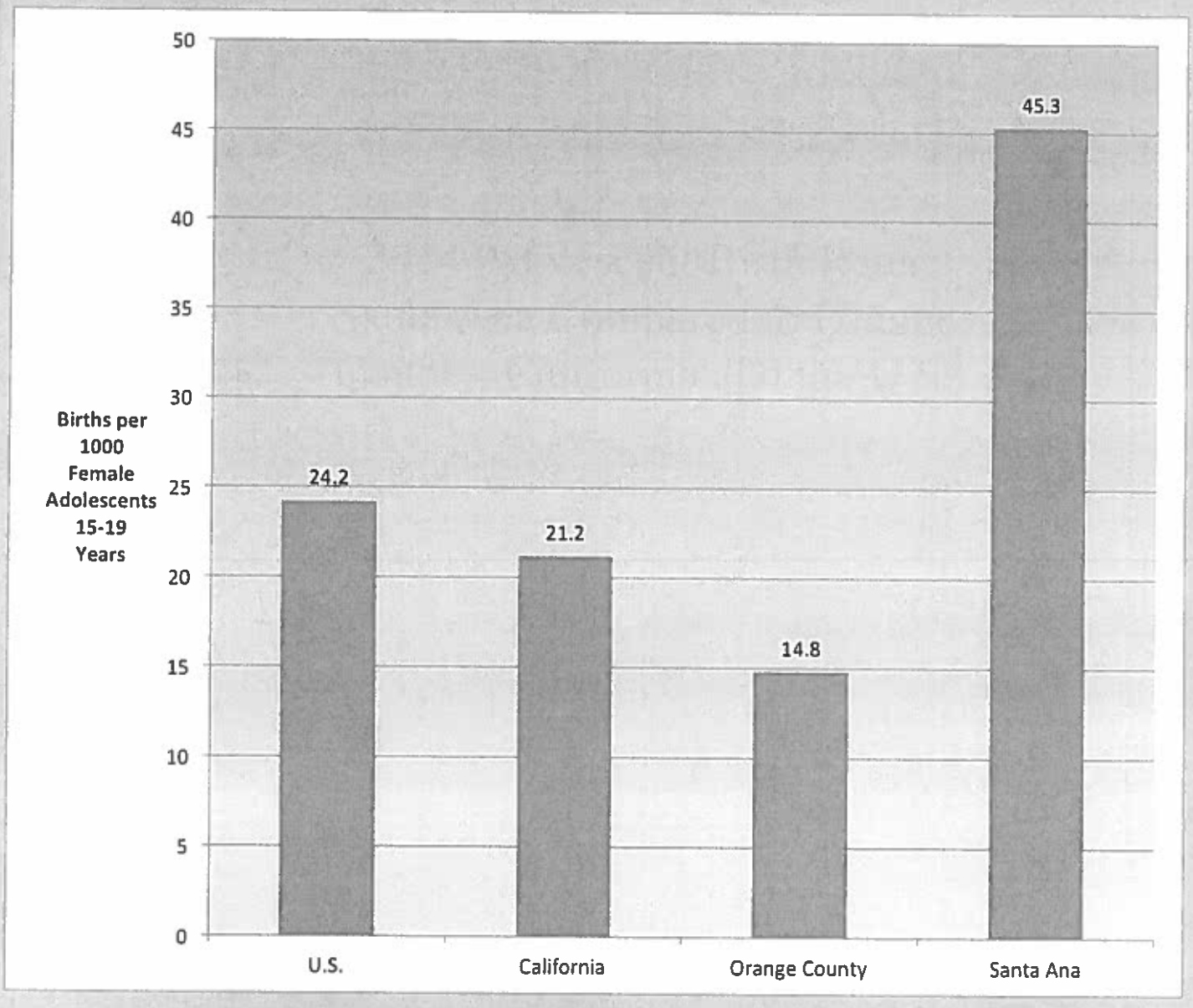
8th grade Science

Health Unit




2014 Adolescent Births
Aged 19 and Below
Orange County Cities
Number of Female Adolescent Births, Age 15-19
500
450
400
350
300
250
200
150
100
50
0
436
362
100
88
77
63
Santa Ana
Anaheim
Garden Grove
Fullerton
Orange
Buena Park
Orange County Cities
Note: This chart shows only the top 6 cities for adolescent births for the year 2014.
Source: California Dept. Of Public Health, 2014 Birth Statistical master File-Epidemiology, Assessment and Program development Branch, Maternal, Child and Adolescent Health

2014 Adolescent Birth Rates Santa Ana Compared to Orange County, California and the U.S.



Notes: Per 1000 females aged 15-19, 2014.

Source: State of California, Center for Health Statistics, Birth Records

Prepared By: Angela Allen-Hess, Special Projects Office

Group Agreements

1.

2.

3.

4.

5.

6.

7.

8.

I agree to follow
these Group Agreements
during our lessons on Sexual Health.

SIGNATURE

DATE

LESSON 1 PREVIEW

Sexual Development

DIRECTIONS Read the following story, and write your answers to each question before coming to class.

The math teacher was trying to demonstrate the concepts of mean, median and mode. So she asked the students to line up against the wall, from shortest to tallest, to measure everyone's height and calculate the average for the class.

This was embarrassing for Timmy, who was the shortest kid in his class. He was frustrated about being less developed than the other boys, and lining up like this just made things worse.

At the other end of the line stood Brenda, the tallest and most developed girl in the school. Since 4th grade she had felt awkward about going into puberty early, and lining up like this made her feel even more awkward and embarrassed.

Question 1. Briefly summarize the facts in this story.

Question 2. Timmy is worried that he is not "normal." Should he feel this way? Why or why not?

Question 3. Brenda also feels like she is not "normal." Should she feel this way? Why or why not?

Question 4. Four years from now in high school, do you think that Timmy will still be the shortest and Brenda will be the tallest? Why or why not?

NAME

Positive Prevention *PLUS* Student Pre-Test

DIRECTIONS Read each statement and circle whether you Agree, Disagree, or Don't Know.

Agree	Disagree	I don't know	1. A good friendship involves honesty, openness, flexibility, and communication.
Agree	Disagree	I don't know	2. In most states, a newborn baby can be safely surrendered within 72 hours of being born.
Agree	Disagree	I don't know	3. When making important decisions it is important to evaluate your options, seek advice from reliable resources, and take responsibility for your decisions.
Agree	Disagree	I don't know	4. By law, it is illegal for a minor (anyone under 18) to have sexual contact with an adult (anyone 18 or over).
Agree	Disagree	I don't know	5. You should not develop friendships with people who are overly controlling, possessive, threatening, and/or abusive.
Agree	Disagree	I don't know	6. Contraception can greatly reduce the risk of unintended pregnancy when used consistently and correctly.
Agree	Disagree	I don't know	7. Everyone has the same sexual orientation and gender identity.
Agree	Disagree	I don't know	8. Sexual harassment is when you make someone else feel bad or uncomfortable because of something (sexual) you say or do.
Agree	Disagree	I don't know	9. It is more important for women to get regular health checkups than for men to get regular health checkups.
Agree	Disagree	I don't know	10. Sexual abstinence is the only 100% effective method for preventing pregnancy and the spread of Sexually Transmitted Infections.
Agree	Disagree	I don't know	11. Anti-retroviral therapy (ART) can keep an infected person healthy for many years, and greatly reduces their chance of transmitting HIV to their sexual partner(s).
Agree	Disagree	I don't know	12. It is possible for a person to have an STI and have NO symptoms.
Agree	Disagree	I don't know	13. Many methods of birth control do not protect against HIV/STIs.

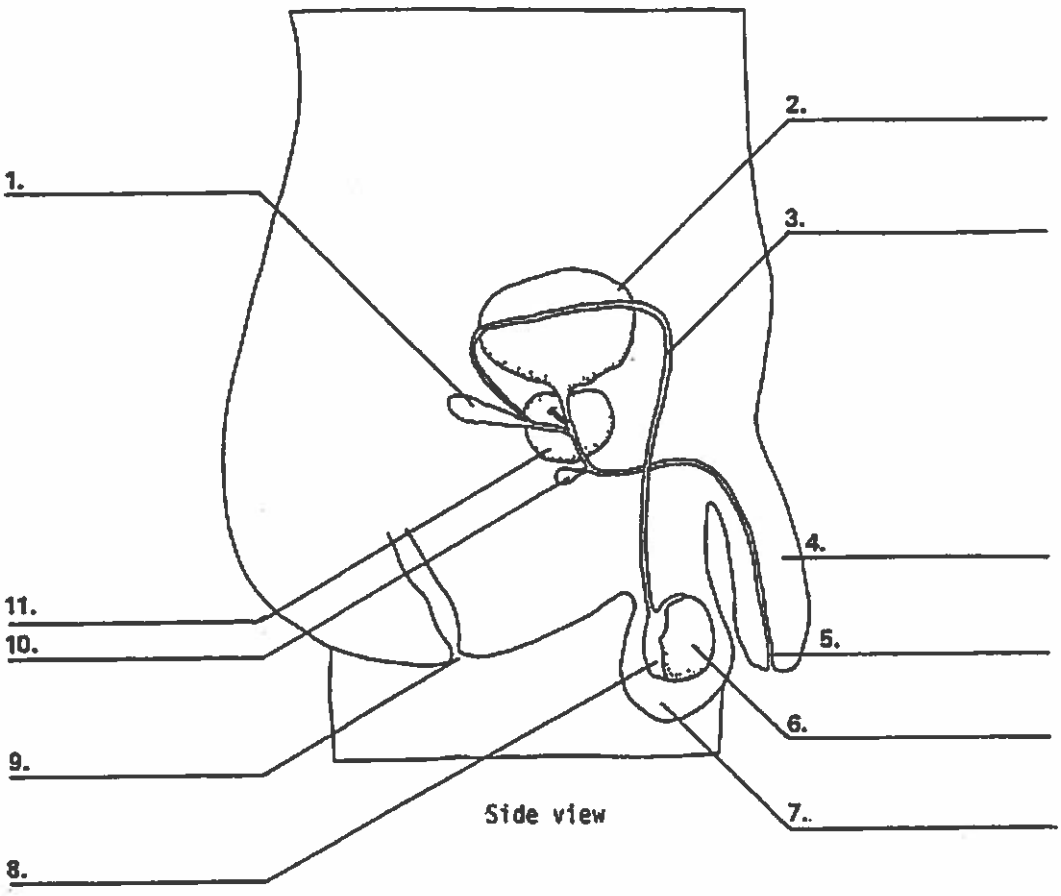
Agree	Disagree	I don't know	14. I am confident that I can make good decisions about delaying sex, even if I am being pressured by others.
Agree	Disagree	I don't know	15. I know how and where to find accurate and reliable sexual health information and sexual health services.
Agree	Disagree	I don't know	16. Sometimes hormone changes during puberty can cause anger and sadness.
Agree	Disagree	I don't know	17. Partners must agree to the sexual behaviors they engage in ("yes means yes").
Agree	Disagree	I don't know	18. Getting pregnant or getting a sexually transmitted infection would interfere with my life plans and goals.
Agree	Disagree	I don't know	19. A condom is most effective in preventing HIV, STIs, and pregnancy if it is used consistently and correctly.

What are some things you would like to learn in this unit?

SIGNATURE OF PARENT OR TRUSTED ADULT

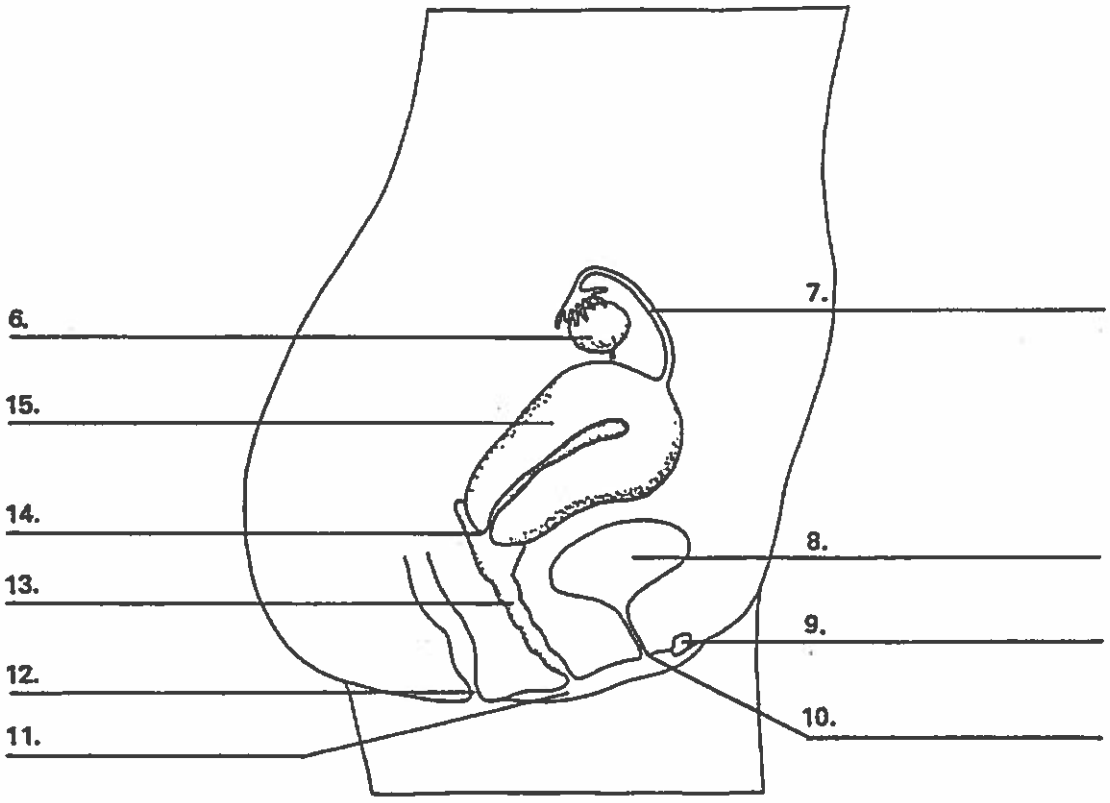
Reproductive System Transparency/Worksheet 1

DIRECTIONS: Fill in the name of each body part. Some will be repeated. Use correct spelling and medical, not slang, words.



NOTE: #9 and #2 are not part of the reproductive system

Reproductive System Transparency/Worksheet 2 continued...



Side view

NOTE: #8, 10, and 12 are not part of the reproductive system

Martin and Tia
Homework (Lesson 8-1)

Name: _____ Date: _____

Instructions:

- Read the following story about Martin and Tia.
- There are two versions of the story. Please read both, and then respond to the questions at the end.

VERSION ONE:

Martin and Tia go to the same school. One of Tia's friends tells her that she heard from her boyfriend's best friend that Martin likes Tia. Tia likes Martin too, but she would never say anything. She asks her friend to tell her boyfriend to say something to Martin, and that if Martin asked her out she'd say yes.

Martin hears from his friend that Tia is interested in him. He finds her outside of school at the end of the day and asks her if she wants to hang out during the coming weekend, and Tia says yes. When he asks her what she wants to do, Tia says, "I don't know, whatever you want."

Martin picks out a movie he's been wanting to see – the new Avengers movie. He texts Tia to meet him at the movie theater. When she gets there, he's already bought the tickets, then holds the door open for her. Tia is really not interested in seeing the Avengers movie but goes along with it because Martin has already bought the tickets. He buys them both popcorn, and when they sit down in the theater and the lights go down, Martin puts his arm around Tia. Tia really wants Martin to kiss her, but she doesn't say anything.

VERSION TWO:

Martin and Tia go to the same school. One of Martin's friends tells him that he heard from his girlfriend's best friend that Tia likes Martin. Martin likes Tia too, but he would never say anything. He asks his friend to tell his girlfriend to say something to Tia, and that if Tia asked him out he'd say yes.

Tia hears from her friend that Martin is interested in her. She finds him outside of school at the end of the day and asks him if he wants to hang out during the coming weekend, and Martin says yes. When she asks him what he wants to do, Martin says, "I don't know, whatever you want."

Tia picks out a movie she's been wanting to see – a love story that all her friends have said will make her cry like a baby. She texts Martin to meet her at the movie theater. When he gets there, she's already bought the tickets, then holds the door open for him. Martin is really not interested in seeing a romantic movie, but goes along with it because Tia has already bought the tickets. She buys them both popcorn, and when they sit down in the theater and the lights go down, Tia puts her arm around Martin. Martin really wants Tia to kiss him, but he doesn't say anything.

QUESTIONS:

1. Which of the versions feels more familiar or realistic? _____

2. Could Version Two ever happen in a relationship between a guy and a girl? Why or why not?

_____

_____

_____

_____

3. If you were to create your own version of this story, how would you combine the two? What would you change or keep? Why would you make these changes?

_____

_____

_____

_____

_____

_____

_____

SEXUAL ORIENTATION: MYTH OR FACT?

Name _____ Date _____

Instructions: Decide whether each of the statements is a myth or a fact and circle the corresponding response.

1. You can tell whether someone is heterosexual, lesbian or gay, or bisexual by the way they look or act.

MYTH FACT

2. Most people know what their sexual orientation is by the time they are 13 years old.

MYTH FACT

3. The way parents raise their children determines whether a child is heterosexual, lesbian or gay, or bisexual.

MYTH FACT

4. If you try really hard, you can change your sexual orientation—regardless of whether you are heterosexual, lesbian or gay, or bisexual.

MYTH FACT

5. In a same-sex relationship, one person always plays a "male" or "butch" role, and the other always plays a "female" or "femme" role.

MYTH FACT

6. The majority of people in the world with HIV or AIDS are gay men.

MYTH FACT

7. With the 2015 U.S. Supreme Court Decision on marriage equality, lesbian, gay, and bisexual people now have all the same legal rights as heterosexual people.

MYTH FACT

Who Do I Know?

Homework (Lesson 8-2)

Name: _____ Date: _____

Instructions: Please complete the questions below, using people in your own life or people you have seen in the media, whose sexual orientations you know and who represent more than one of the orientations we discussed in class (also listed below). What have you learned from these people about what it is like to be their sexual orientation?

1). Name: _____

How You Know Them: _____

Are they: Heterosexual Lesbian Gay Bisexual Queer Other: _____

What is one thing you learned about being that orientation from this person?

_____

_____

_____

2). Name: _____

How You Know Them: _____

Are they: Heterosexual Lesbian Gay Bisexual Queer Other: _____

What is one thing you learned about being that orientation from this person?

_____

_____

_____

3). Name: _____

How You Know Them: _____

Are they: Heterosexual Lesbian Gay Bisexual Queer Other: _____

What is one thing you learned about being that orientation from this person?

_____

_____

_____

MYTH VS. FACT: GENDER IDENTITY AND SEXUAL ORIENTATION

Name: _____ Date: _____

Instructions: Please read the following statements and indicate whether you think each is a myth or a fact by circling the appropriate answer.

1. People can choose their sexual orientation.

MYTH FACT

2. People can choose their gender identity.

MYTH FACT

3. People can choose their gender expression.

MYTH FACT

4. You can usually tell a person's sexual orientation just by looking at them.

MYTH FACT

5. A girl who is really athletic is either a lesbian or transgender.

MYTH FACT

6. A person can look like a boy or a man and feel on the inside like they are a girl or a woman.

MYTH FACT

LESSON 3 PREVIEW

Bullying and Relationship Abuse

DIRECTIONS Read the following story, and write your answers to each question before coming to class.

When Josh was a baby, he had some bleeding in his brain. He was in the hospital for months, and when he was discharged, he was blind in one eye and had a muscle weakness in his leg.

Josh tried really hard to do well in middle school. When his leg got stronger, he even tried out for the track team!

Josh was also very smart. But maybe because he had a limp, and because he wore special glasses, the other students made fun of him. They would even call him "retard."

Question 1. Briefly summarize the facts in this story.

Question 2. Why do you think Josh went out for the track team?

Question 3. Why do you think other students picked on Josh?

Question 4. What are some things that Josh could do to end the bullying?

Protect Yourself

DIRECTIONS A healthy relationship is honest, equal, respectful, and responsible. Some people have identified the behaviors listed in the chart below as **warning signs** that a relationship is not honest, equal, respectful, and responsible. Check what you would probably do in each of the following situations.

Imagine Someone:	You Would Probably:			
	Do nothing	Discourage behavior	Seek help	End relationship
1. Makes negative comments about your clothes, body, or hair.				
2. Always decides where you will go together or what you should do.				
3. Puts you down in public.				
4. Asks you to send them nude pictures of yourself.				
5. Ignores what you want to do.				
6. Gets angry when you spend time with others.				
7. Tells you to keep secrets.				
8. Hits you and then apologizes.				
9. Makes progressively more sexual moves on you without your permission.				
10. Forces you to have sex with others for money (sex trafficking).				

Adapted from *Unequal Partners, 2nd Ed.* Sue Montfort and Peggy Brick, Planned Parenthood of Greater Northern New Jersey, 2000.

LESSON PREVIEW

Sex Trafficking

DIRECTIONS Read the following story, and write your answers to each question before coming to class.

Sheri and her friend stood in front of the department store mirror, laughing and talking and trying on clothes. Sheri noticed a young man watching her from the other side of the store. Then as they stood in line to check out, he approached Sheri and said to her, "Hi. My name is John. I couldn't help noticing how beautiful you are!" Sheri and her friend giggled, and didn't know how to respond. John continued, "You would make a great model! There is a lot of money in it for you. Tell me, how are things going for you at home?"

At that point Sheri's friend jerked her arm and whispered, "This guy is creepy. Let's get out of here." So the girls put their purchases on the counter, and walked quickly out into the mall. They never turned back to see if they were being followed.

Several days later, Sheri was surprised to see John waiting for her after school. "Listen" he said, "I've set up this great photo shoot for you this afternoon, and would love to have you come along. You can earn a lot of money doing this for me. Please?" Sheri reluctantly got into John's car. They drove about 30 minutes to a nearby town, all the while John telling her how beautiful she was, and that she could make a lot of money. He said that he could also set her up with a place to live if she wanted.

John pulled the car into a hotel parking lot, and asked Sheri to follow him. He knocked on a door, and an older man answered. John turned to Sheri and said, "This is the photographer. Just do anything he asks you to do. Don't worry. You and I can make a lot of money doing this."

Question 1. Briefly summarize the facts in this story.

Question 2. What were the signs that John might be a threat to Sheri's safety?

Question 3. List several ways Sheri could have avoided this situation.

NAME _____

What Would You Do?

DIRECTIONS Put a check in the box (or boxes) to indicate what you would do in the following situations.

What would do if...	Agree or Say Yes	Discourage behavior	Leave or Escape	Tell Someone
1. A stranger promised to pay you a lot of money if you would do something for him/her.				
2. Your new boyfriend or girlfriend asked to have sex with someone else for money.				
3. An online stranger asked to meet you someplace.				
4. Your little brother told you about being taken to a hotel and being sexually molested.				
5. You notice that your friend is having constant cellphone communication with multiple people, and is keeping a record of names and monetary amounts.				
6. You notice that your friend has expensive jewelry, new clothing or a cell phone they cannot afford.				

Question 1. Name another sign or "red flag" of sex trafficking you can remember from the lesson.

_____

_____

Question 2. If you were being pressured into sex trafficking, who could you go to for help?

_____

Question 3. If you found out a friend was being sex trafficked, what could you do?

_____

_____

SIGNATURE OF PARENT OR TRUSTED ADULT _____

NAME _____

Lesson Wrap-Up

Part I. Ask Yourself

DIRECTIONS Check your understanding of today's lesson by answering the following True-False questions.

T F Child Sex Trafficking is a form of child abuse.

T F To avoid being arrested, children who are the victims of sex trafficking must prove they were forced or coerced into their actions.

T F Child sex traffickers often "groom" their victims by acting like their boyfriend, or like they really care about them.

T F Runaways and victims of sex trafficking can call 1-800-RUNAWAY for help.

Part II. Ask a Friend

DIRECTIONS Turn to a partner to check your answers and tell her/him the most interesting or important thing you learned during this lesson.

Part III. Ask Yourself Again

DIRECTIONS Answer the question in this section honestly. How committed are you to preventing child sex trafficking among your friends and family members? Circle your answer below.

Not Committed *Very Committed*

1 2 3 4 5

Part IV. Ask a Parent or Trusted Adult

DIRECTIONS Share your worksheets with your parent(s) or trusted adult, and discuss with them what they would want you to do if you were being pressured into sex trafficking.

SIGNATURE OF PARENT OR TRUSTED ADULT _____

Why Would Someone Choose to Become A Young Parent?

Instructions: In the space below, please list as many reasons why you think a teenager who discovers they are pregnant might choose to become a young parent, and why you think they might choose not to.

Reasons a Teen Might Choose to Become a Young Parent	Reasons a Teen Might Choose NOT to Become a Young Parent

Why Would Someone Choose to Place A Baby for Adoption?

Instructions: In the space below, please list as many reasons why you think a teenager who discovers they are pregnant might choose to place a baby for adoption, and why you think they might choose not to.

Reasons a Teen Might Choose to Place a Baby for Adoption	Reasons a Teen Might Choose NOT to Place a Baby for Adoption

Why Would Someone Choose to End A Pregnancy?

Instructions: In the space below, please list as many reasons why you think a teenager who discovers they are pregnant might choose to have an abortion, and why you think they might choose not to.

Reasons a Teen Might Choose to Have an Abortion	Reasons a Teen Might Choose NOT to Have an Abortion

Pregnancy Website Hunt!

Homework (Lesson 8-7)

Name: _____ Date: _____

Instructions: Answer the questions below, using any of the following three websites. Be sure to include the link to where you found the information!

- http://www.plannedparenthood.org/teens
- http://www.plannedparenthood.org/learn/pregnancy/prenatal-care
- http://sexetc.org

1. How does a person take a pregnancy test?

_____

_____

Link where I found this information:

2. What are some suggestions for how a young person or couple should tell their parent(s) or caregiver(s) about the pregnancy?

_____

_____

_____

Link where I found this information:

3. What tends to happen during a prenatal care visit?

_____

_____

_____

Link where I found this information:

4. One new thing I learned about pregnancy is:

_____

_____

Link where I found this information:

LESSON 6 PREVIEW

Myths and Stereotypes about HIV Infection

DIRECTIONS Read the following story, and write your answers to each question before coming to class.

Terrel and Jeff were playing basketball after school when Terrel suddenly asked, "Do you know anybody with AIDS?"

"No way!" Jeff panted as he made his shot.

"But how do you know if they have AIDS or not?" asked Terrel.

"All you have to do is just look at them. If they look clean – and they don't look gay – no worries!" Jeff replied.

Terrel stopped asking questions, and just kept playing basketball. He was still worried about his older sister.

Question 1. Briefly summarize the facts in this story.

Question 2. Do you think Jeff's description of people with AIDS was accurate? Why or why not?

Question 3. Why do you think Terrel is worried about his older sister?

Question 4. If Terrel is concerned about a friend or family member who may have AIDS, where could he go for information?

HIV AND AIDS

Homework (Lesson 6-8)

Name: _____ Date: _____

Instructions:

- There are some unique aspects of HIV and AIDS that are different from other STIs.
- Answer the questions by going to http://teens.webmd.com/hiv-aids-and-teens-faq

1. What does HIV cause?

2. HIV weakens which system in the human body?

3. That means it's harder for people with HIV to fight off certain _____.

4. Which three body fluids do NOT transmit HIV?

5. Can you get HIV from someone sneezing on you?

6. You can't tell whether someone has HIV just by looking at them. How can people know for sure whether they have HIV?

7. If someone doesn't know where to go get tested, what number can they call that's both free and confidential (no one will know they called)?

NAME

STI Worksheet

DIRECTIONS For each of the following Sexually Transmitted Infections, check whether it is caused by a virus, bacteria, or something else ("other"), and whether it can be cured. Then answer the questions at the bottom of the page.

STI Check:	Virus	Bacteria	Other	Curable?
Gonorrhea				❑ yes ❑ no
Syphilis				❑ yes ❑ no
Chlamydia				❑ yes ❑ no
Human Papilloma Virus (HPV)				❑ yes ❑ no
Human Immunodeficiency Virus (HIV)				❑ yes ❑ no
Hepatitis B				❑ yes ❑ no
Herpes				❑ yes ❑ no
Pubic Lice				❑ yes ❑ no

1. What do all the incurable STIs seem to have in common?

2. Identify a local clinic where a person can get an STI test:

Clinic Name:

Address:

Telephone Number:

STI Clinic Hours:

SIGNATURE OF PARENT OR TRUSTED ADULT

Epidemic Lab

Name: _____ Date: _____ Period: ____

How does an epidemic spread?

Some people are carriers of disease. These carriers show either no symptoms associated with that disease or only mild symptoms. At some point they may eventually get sick, but the danger to others is that a carrier may not be recognized as having the disease. They carry the virus inside them, however, and may spread it to people they contact. This is one reason why some viruses, like AIDS, can be spread so quickly. Some people just don't know they have it.

In this lab, one of you will be the original carrier of a "disease." It's perfectly harmless if handled properly. You will carry it in a cup rather than in your body. That would get a little messy. The original carrier will make contact with three students who will then make contact with others. All the students will then be tested to see who has become infected.

Procedure

1. When you are instructed, come to the front of the room and obtain a cup from your teacher. One of you is now "infected," but we have no idea who that person is. **PLEASE DO NOT DO *ANYTHING* TO THE STUFF IN THE CUP JUST YET!!**

2. With your cup in hand, mingle around the classroom when asked to do so by your teacher.

3. a. Choose someone at random and empty the contents of your cup into the other person's cup.
   b. Then return half of the solution back to your cup
   c. Record the name of the person you exchanged solution with on this sheet.

4. Repeat step 3 two more times.

5. Carefully record the names of the people your exchanged with on the sheet on the overhead and return to your seat with your solution.

6. When asked to do so, come to the front of the class and get a couple drops of phenol red placed in your cup. **If it turns red, you are infected. If it doesn't, no sweat!**

How does an epidemic spread?

Who did you exchange with?

1. _____
2. _____
3. _____

Did you find out that you were infected, or not infected? (Circle one)

Questions to answer …

1. What would be the greatest number of individuals that could test positive after three rounds of contact?

2. What would be the smallest number of individuals that could test positive after three rounds of contact?

3. What would be the greatest number of individuals that could test positive if we had done four rounds?

4. How many rounds of contact would it take for everyone in the class to be infected?

5. Reflecting on this activity, how can a disease like AIDS spread so fast?

Media Analysis Skills

1. What product is being advertised?

2. What specific information about the product is provided?

3. Describe the people and/or images used in the advertisement.

4. What does the appearance of the people and/or images imply (suggest) about the product?

5. What is the advertiser trying to get you to do?

BE ASSERTIVE!
Worksheet

Name _____ Name _____

Instructions:

- Pretend that someone is pushing you to have sex with them, and you want to wait. The following statements are possible responses to that pressure.
- Circle whether each statement is PASSIVE, AGGRESSIVE, or ASSERTIVE. If it's not assertive, write a response that is.

1. I don't want to have sex with you, grow up!

PASSIVE, AGGRESSIVE, or ASSERTIVE?

ASSERTIVE: _____

2. Listen, having sex means taking risks – and I'm not willing to risk my health and my future like this.

PASSIVE, AGGRESSIVE, or ASSERTIVE?

ASSERTIVE: _____

3. If all you can think about is sex, there's something wrong with you.

PASSIVE, AGGRESSIVE, or ASSERTIVE?

ASSERTIVE: _____

4. I'm not ready to have sex right now. But I really like it when we kiss a lot.

PASSIVE, AGGRESSIVE, or ASSERTIVE?

ASSERTIVE: _____

5. I guess we could hang out at your place – I mean, I'm really uncomfortable about your parent(s) not being there, but if you really want to, I'll come with you.

PASSIVE, AGGRESSIVE, or ASSERTIVE?

ASSERTIVE: _____

Adapted from an activity in Goldfarb, E. and Schroeder, E. (2004), Making SMART Choices about Sex: A Curriculum for Young People. Rochester, NY: Metrix Marketing