

Middle School/High School  
Standards Based Activity Set

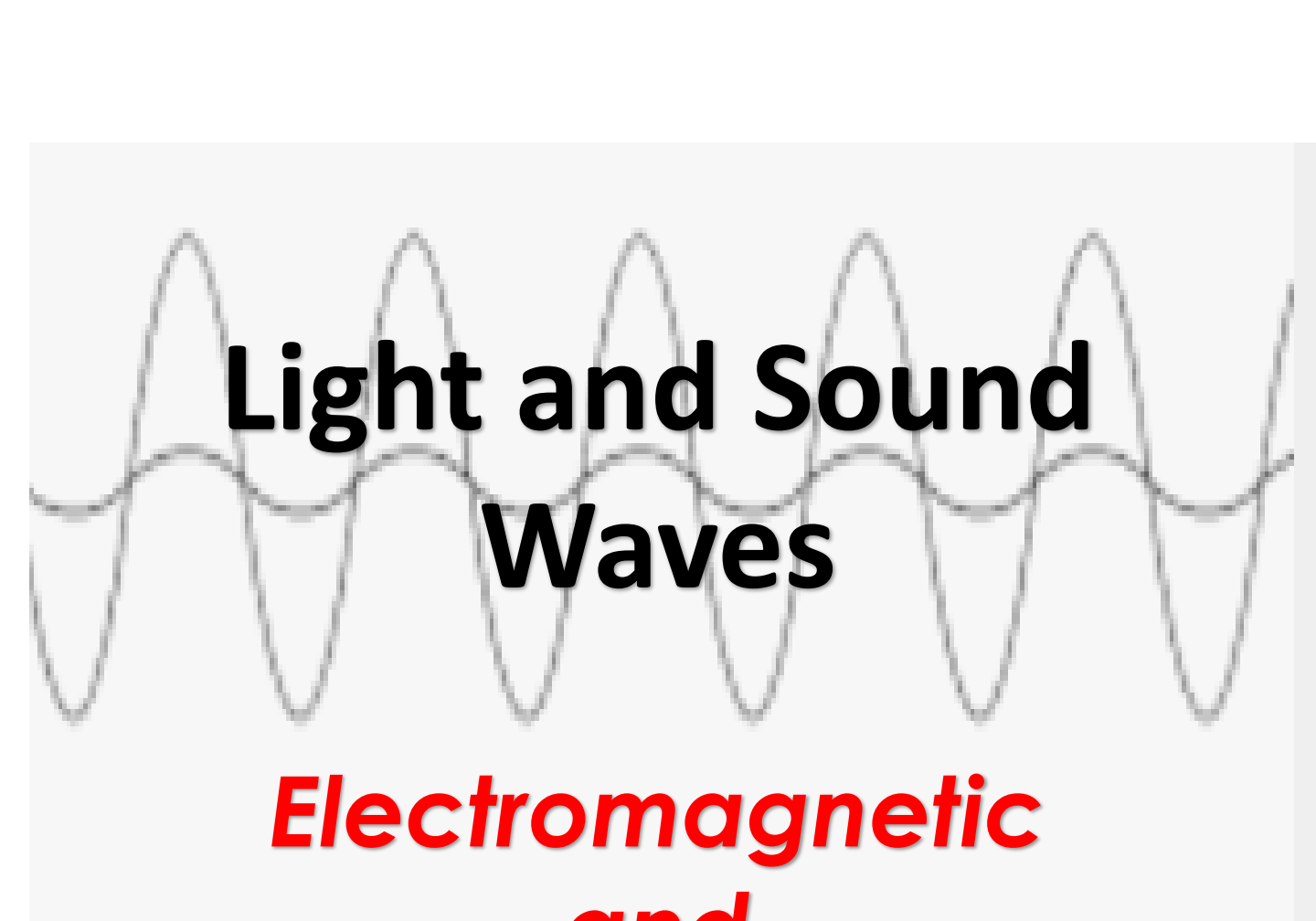
@dtaschools.com

# Mechanical & Electromagnetic Waves



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# **Light and Sound Waves**

## ***Electromagnetic and Mechanical Waves***

**Adapted Information Textbook**



*AYC&M Academic Series: Juanita Pritchard/DTA Schools*

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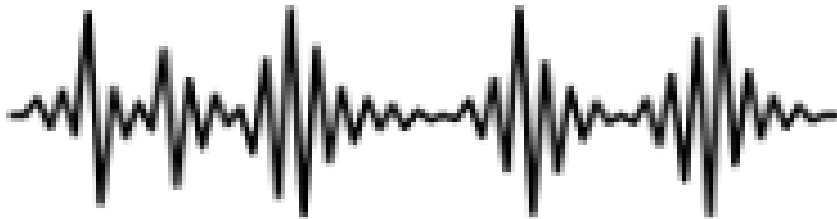
**What is a wave?**



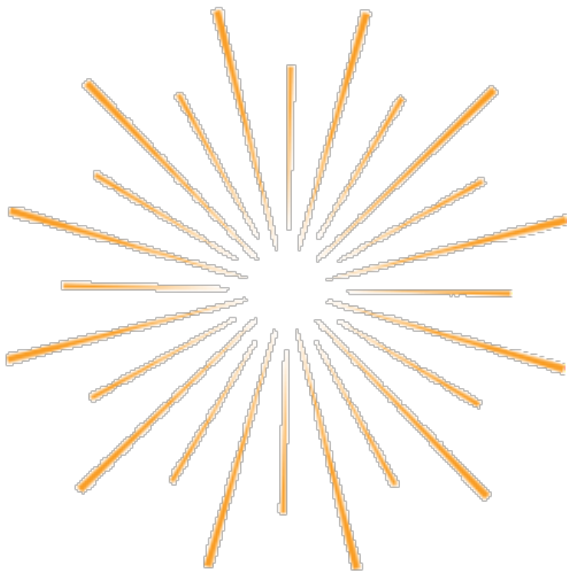


**Waves show the pattern of motion.**

**Think of the waves in an ocean.**



**There are different types of waves.**

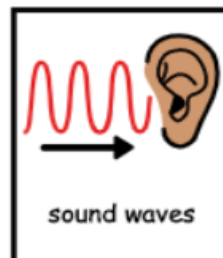
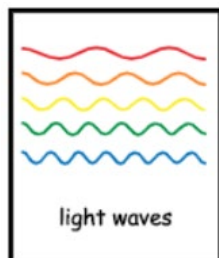


***light waves***

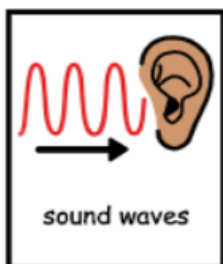


***sound waves***

**Let's look at 2 main types of waves.**



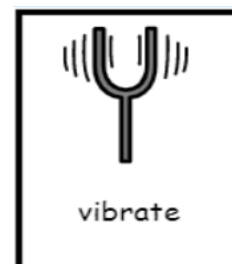
# What is a sound wave?





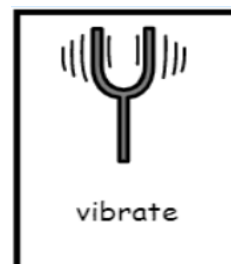
When something **vibrates**, it makes a sound.

**Vibration** means to move something back and forth.



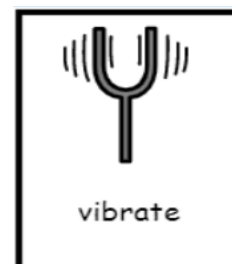


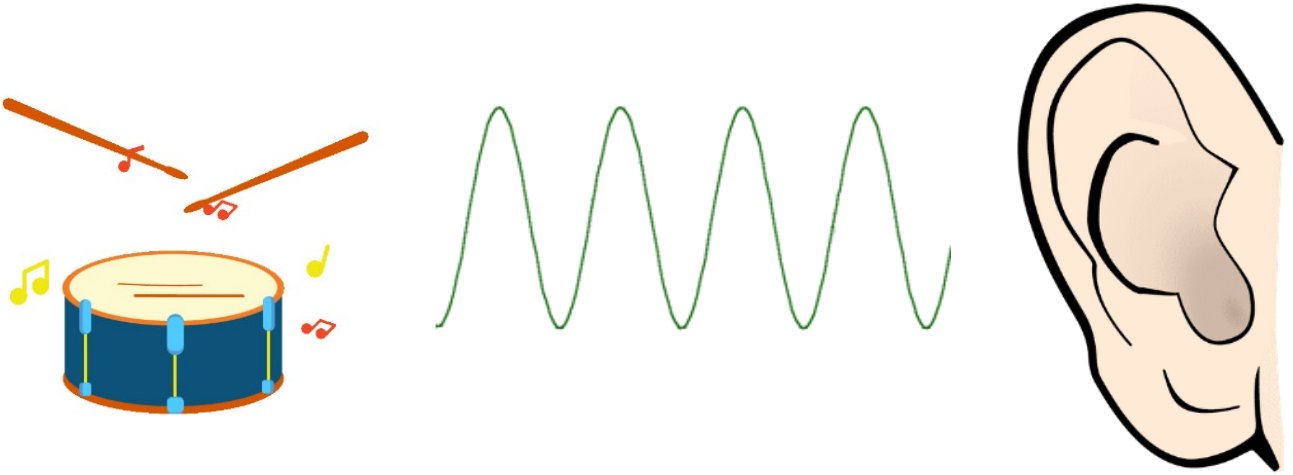
A tuning fork **vibrates** to make a sound.





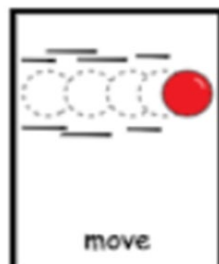
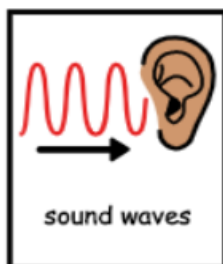
A guitar string **vibrates** to make a sound.

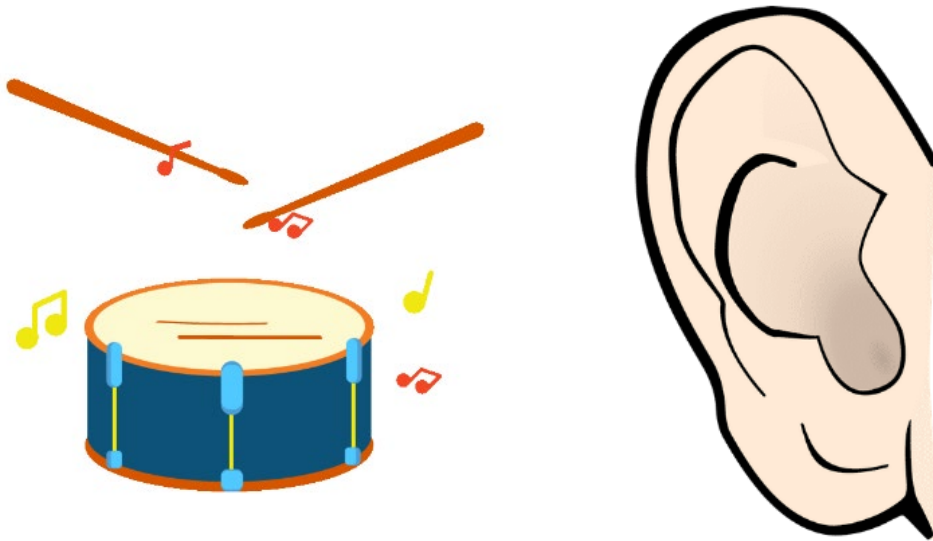




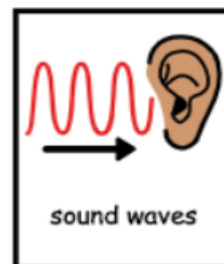
**Sound waves are vibrating energy.  
Sound waves move back and forth  
through solids, liquids and gases.**

**That's how you can hear sounds.**

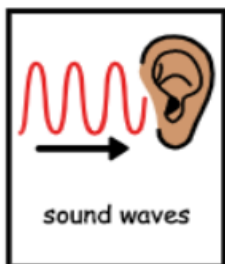




**Sound waves cannot be seen --  
they are invisible.**



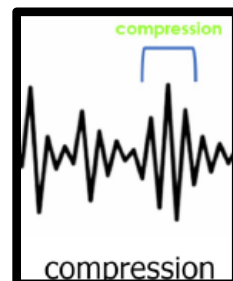
**Sound** waves are  
also called  
**mechanical** waves.



compression



In a sound wave sometimes the vibration particles move close together. These are called **compressions**.





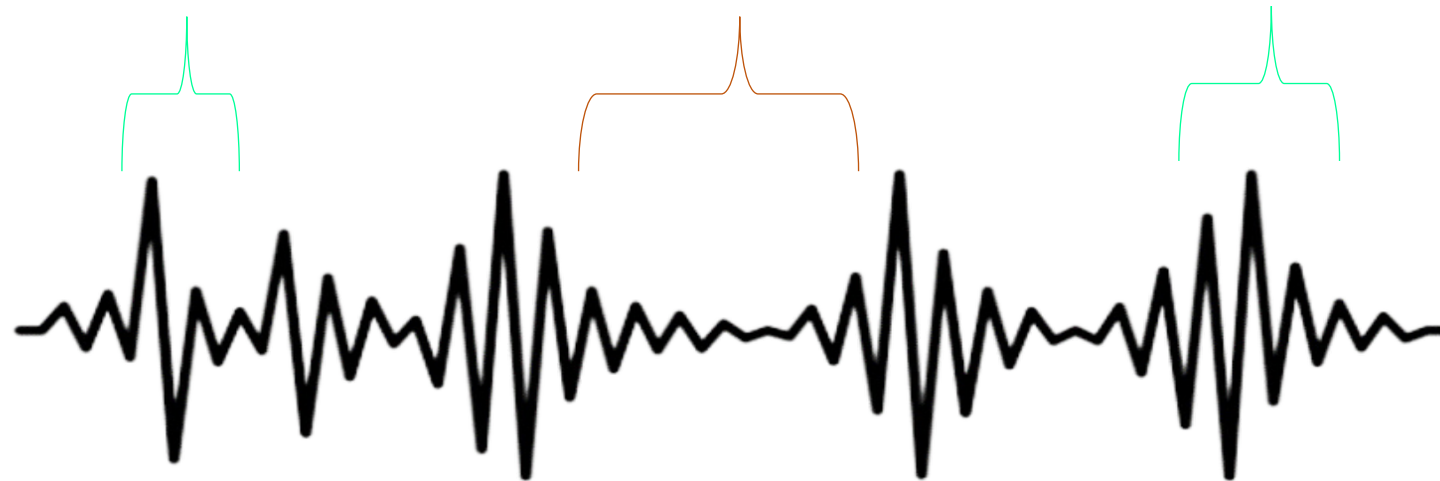
If the vibrating particles move farther apart it is called **rarefaction**.



compression

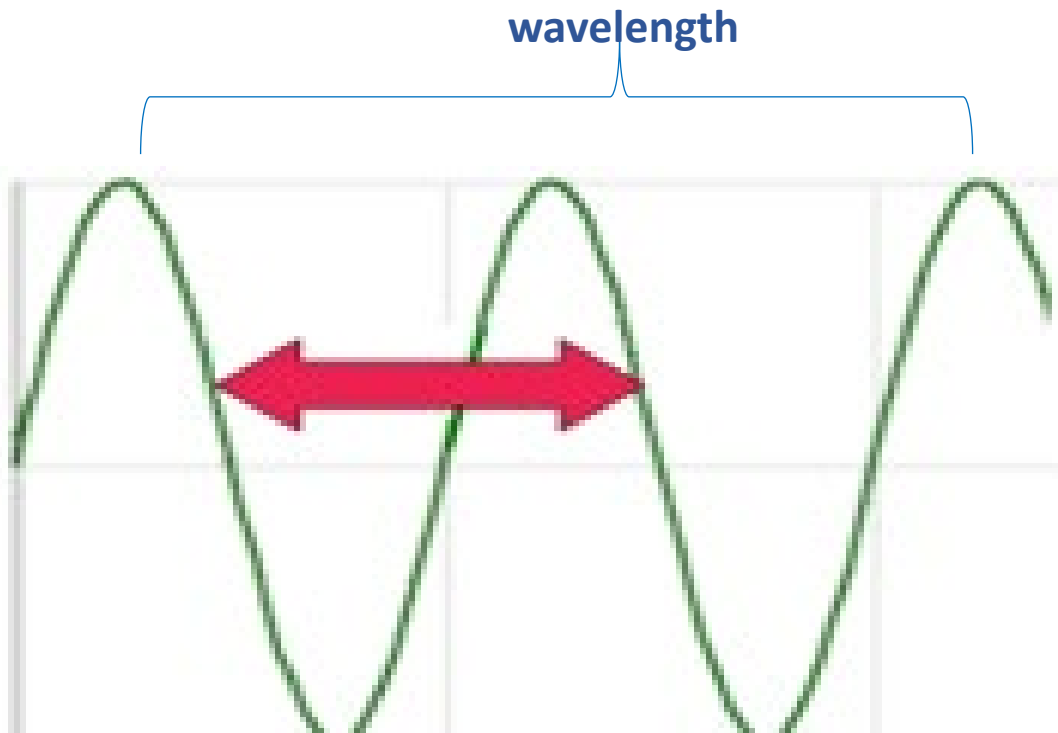
rarefaction

compression

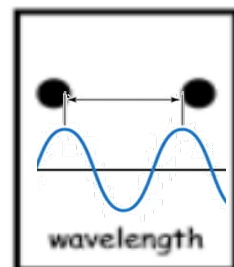


**The compression (particles closer together) will make a higher sound.**

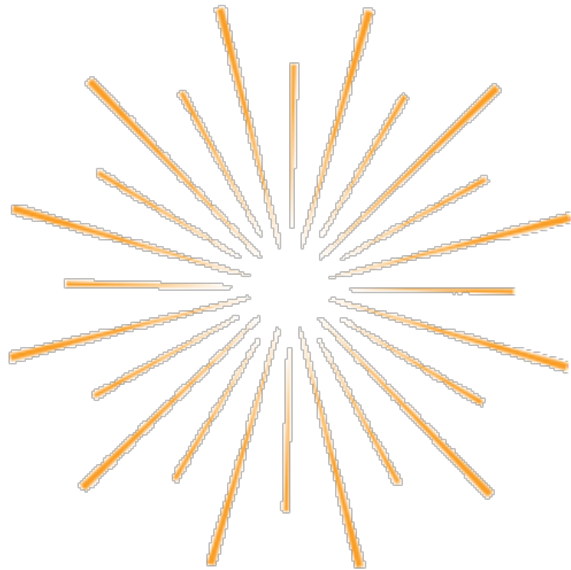
**The rarefaction (particles vibrating farther apart) will make a lower sound.**

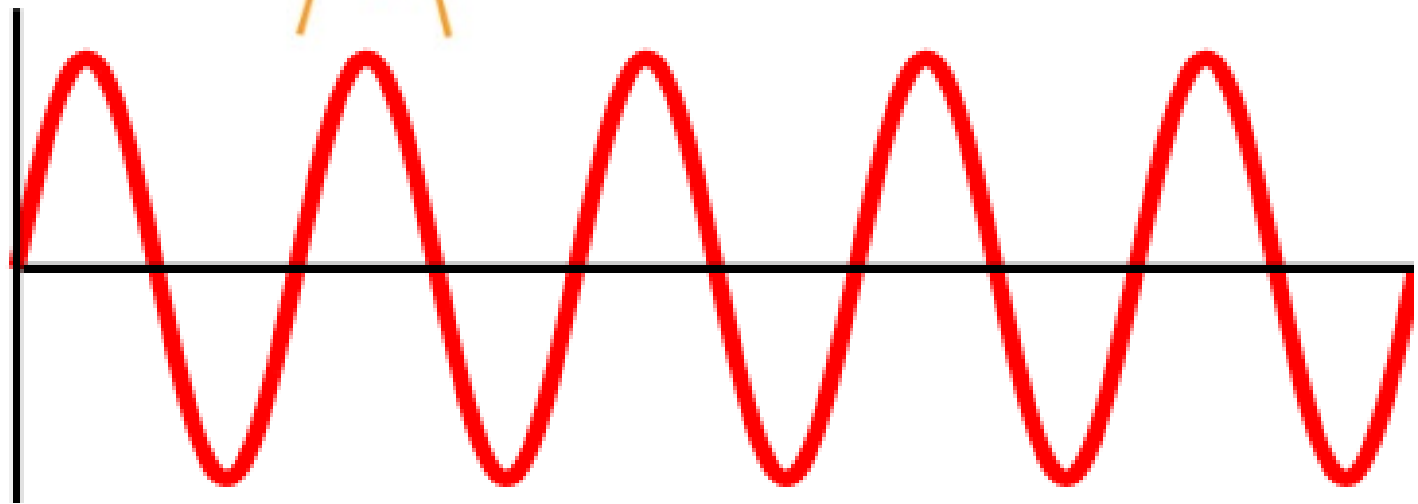


A **wavelength** is the distance between the wave peaks.

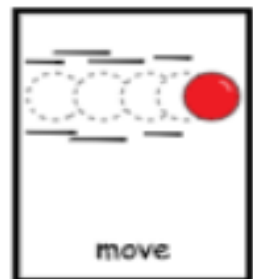


# What is a light wave?





**Light also travels or moves in waves.**



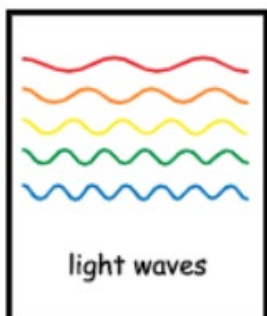
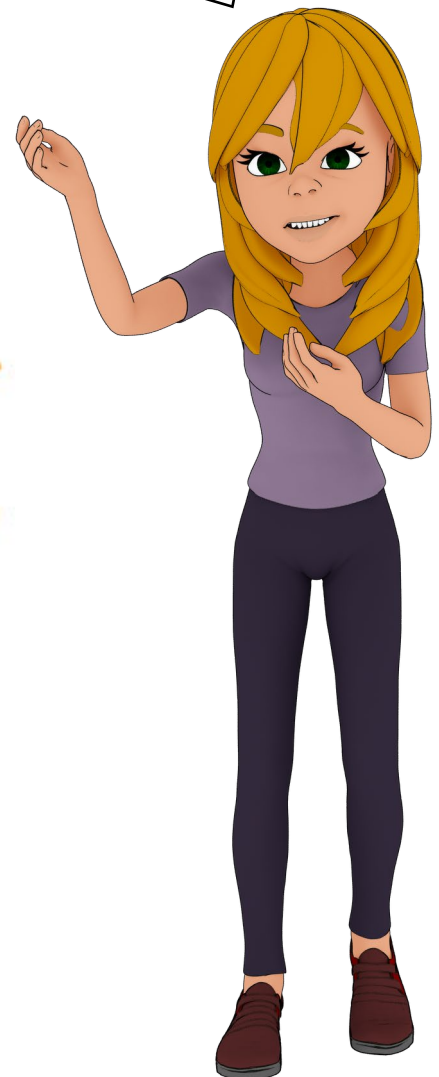


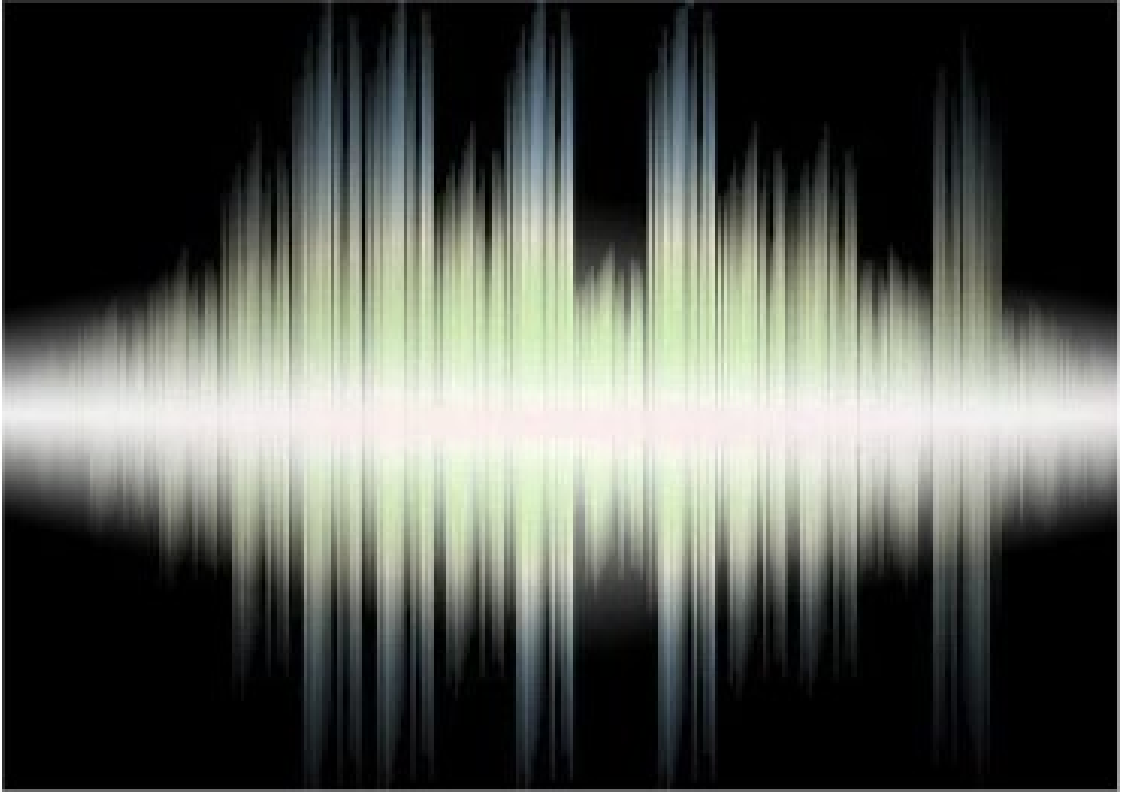
**Light can travel through empty space or a vacuum.**

**That is how we can see the stars that are so far away.**



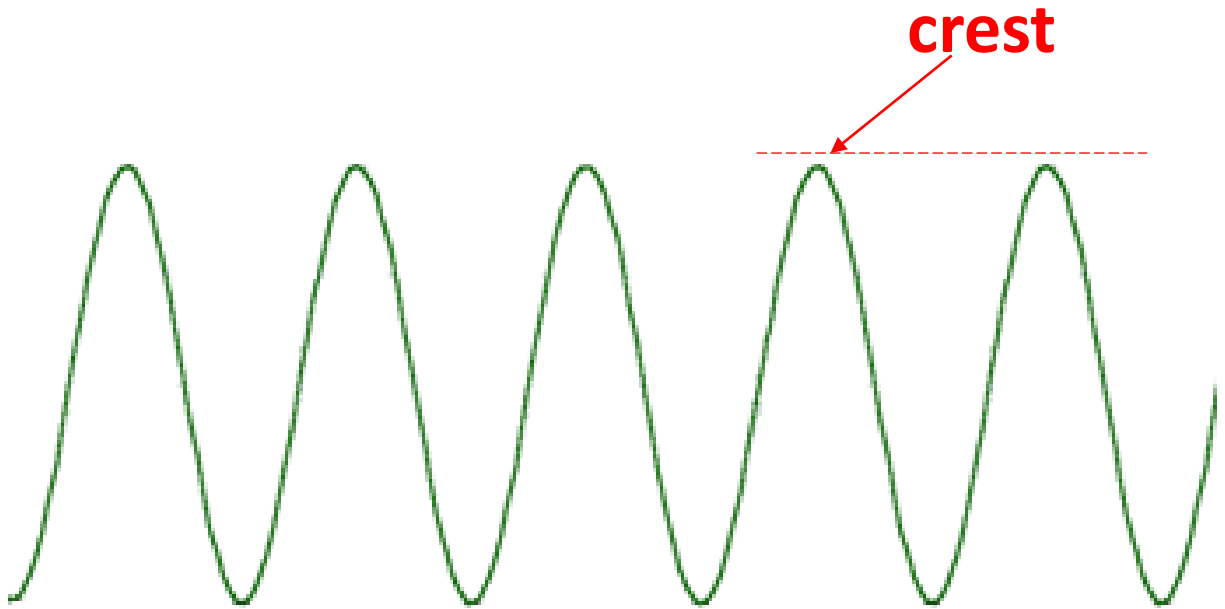
**Light** waves are also called **mechanical** waves.



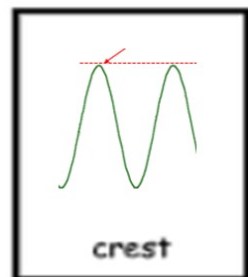


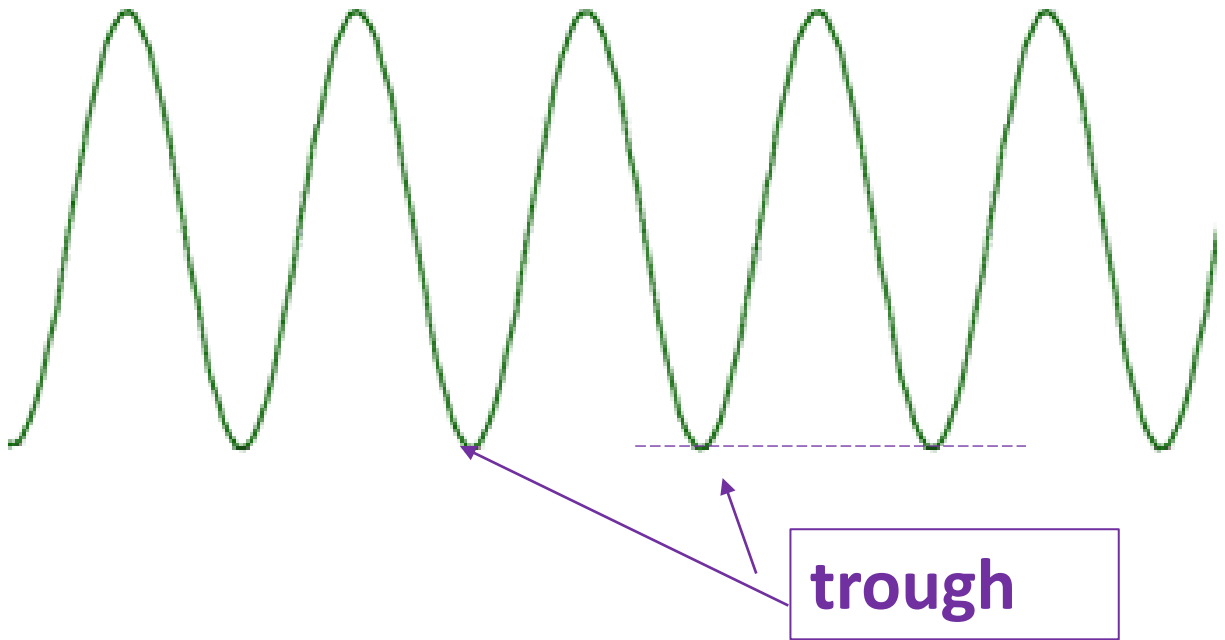
Light radiates from a source in waves. Each wave has two parts: an **electric** part and a **magnetic** part.

That's why light waves are called **electromagnetic** waves.

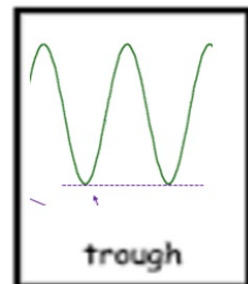


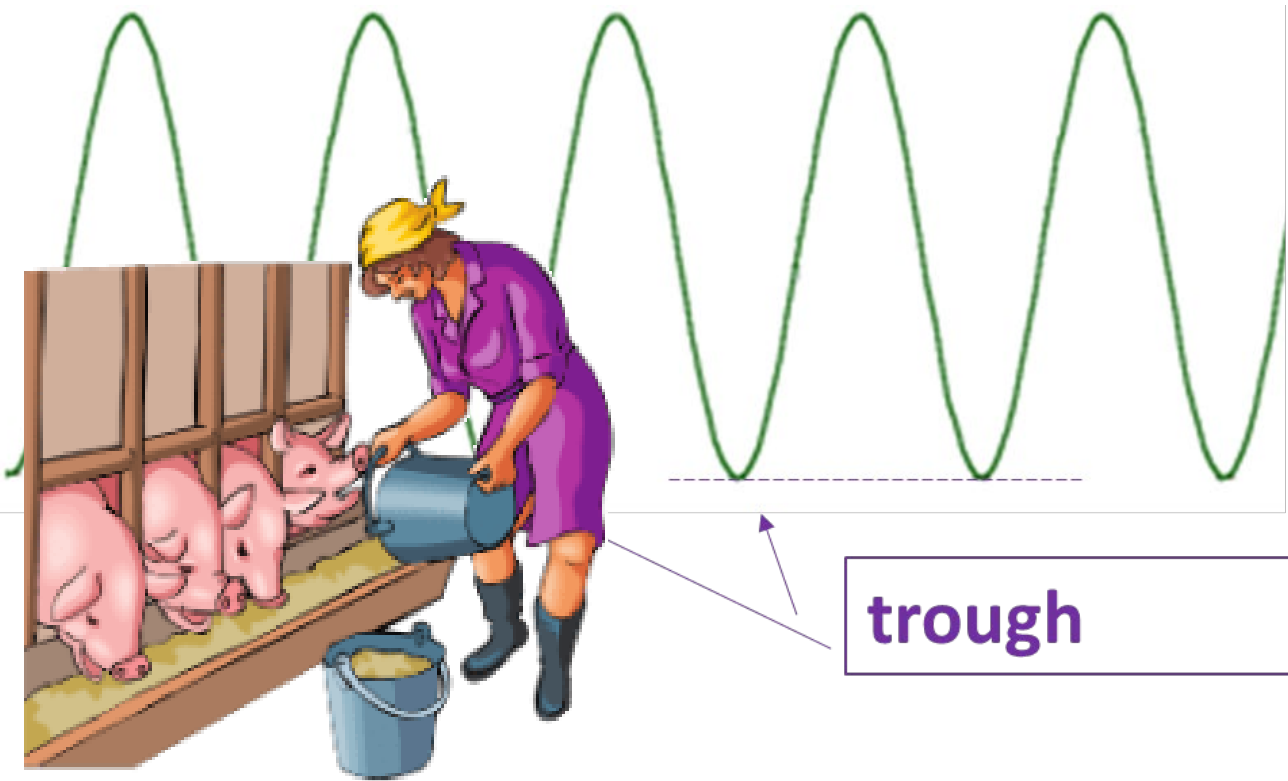
The **crest** is the highest peak or peaks of a sound wave.



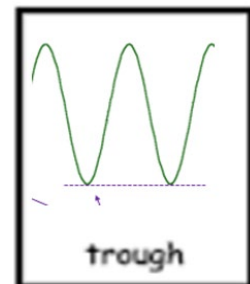


The **trough** is the lowest peak or peaks of a sound wave.

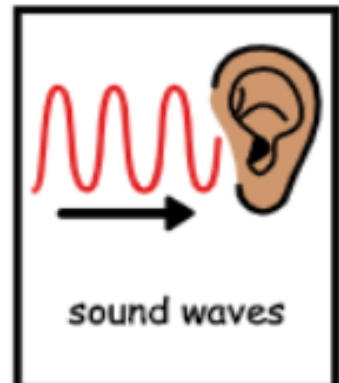
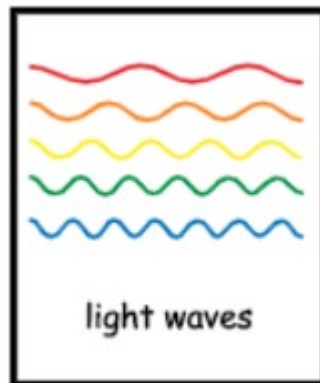


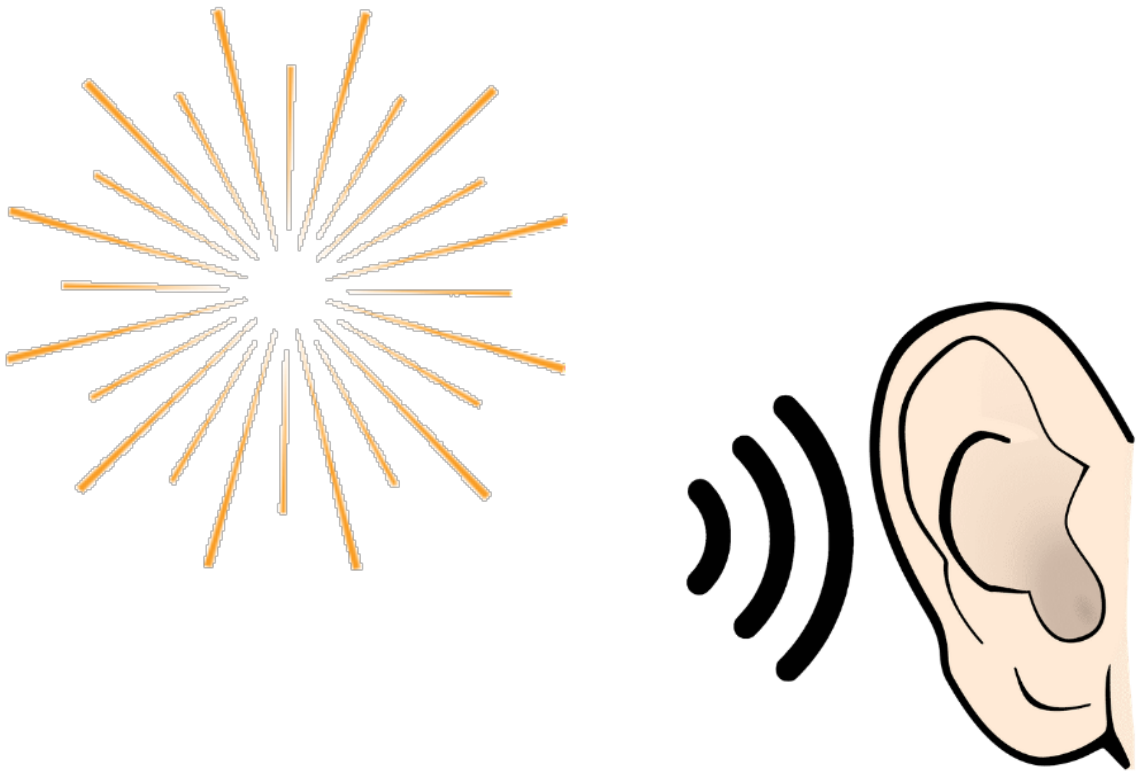


One way to remember that a **trough** is the lowest peak of a sound wave is to remember that pigs eat out of a trough which is low to the ground.



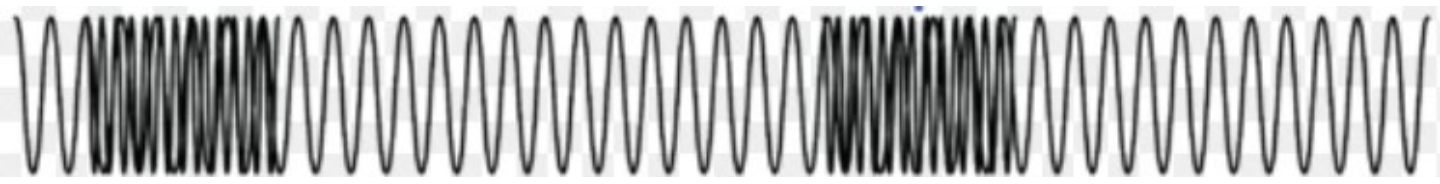
# How do *light waves* and *sound waves* compare?



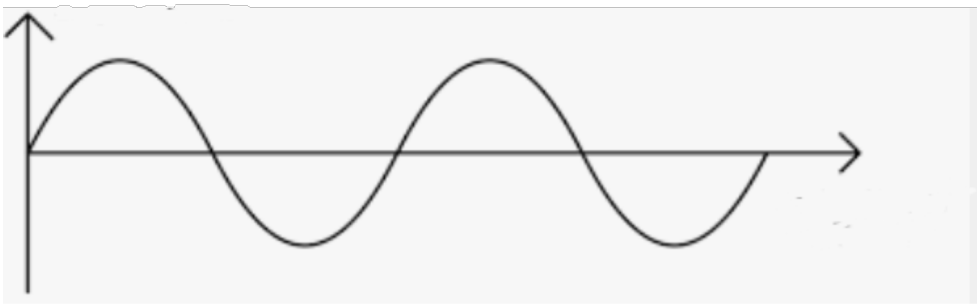


**Light waves and sound waves are both types of waves.**

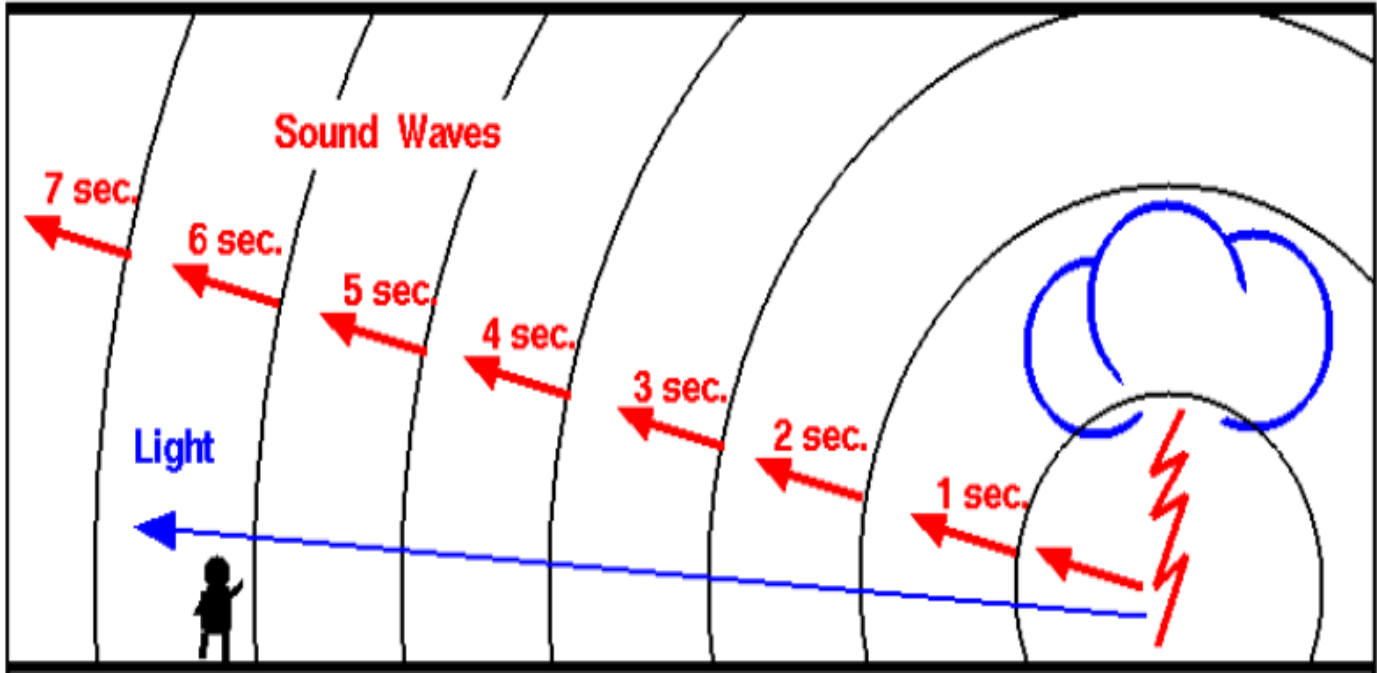
**They show movement and carry energy from one place to another.**



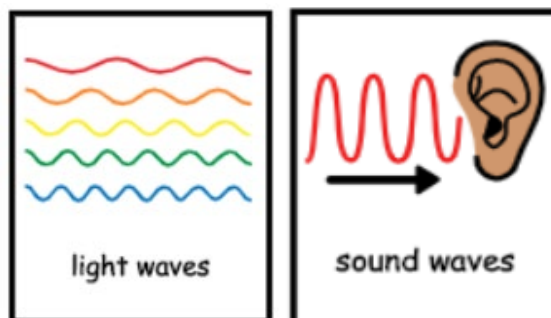
Sound waves are **longitudinal waves** made up of alternating compressions and rarefactions.

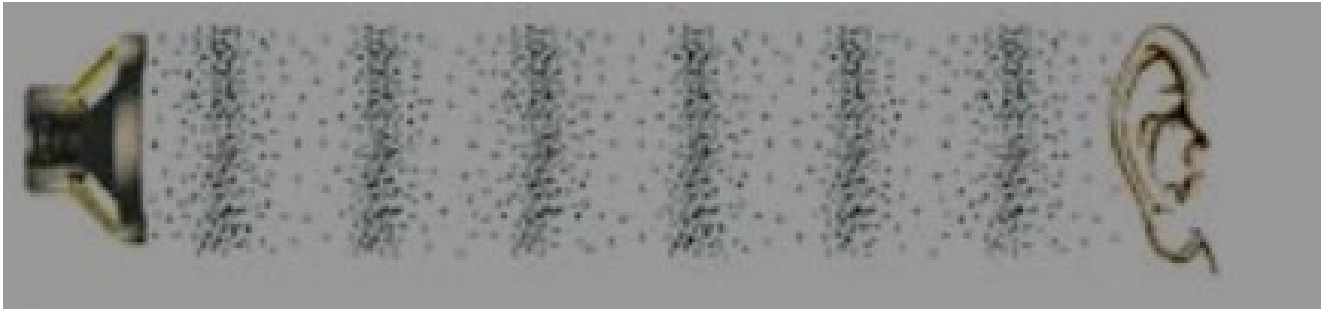


Light waves are **transverse** waves like waves on water, with the surface going up and down.

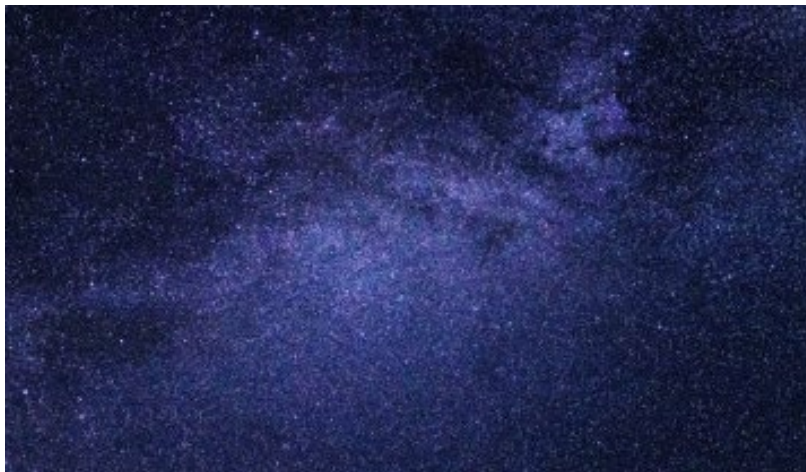


**Light waves** travel or move much faster than **sound waves**.

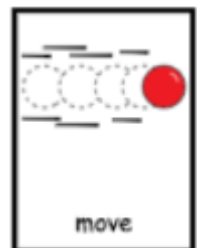




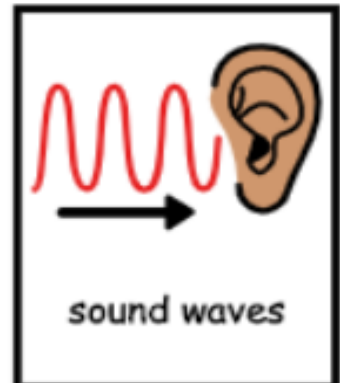
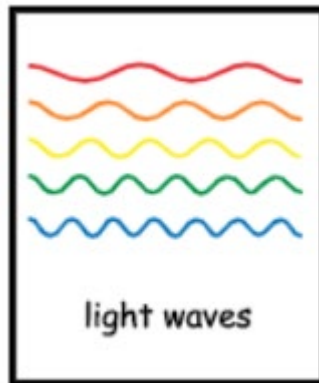
**Sound waves cannot travel in a vacuum, they need a medium like air or water.**



**Light waves can travel in a vacuum, like space.**



**Wow! Light waves  
and sound waves  
are all around us!**



**THE  
END**

# Vocabulary

sound waves

light waves

vibrate

sound

compression

rarefaction

crest

trough

move

wavelength

## Core Words

see

fast

slow

up

down

# Standards

Georgia Standard of Excellence S8P4a Middle School Physical Science

**GSE S8P4 a** Ask questions to develop explanations about the **similarities and differences between electromagnetic and mechanical waves.**

(transverse and longitudinal waves and wave parts such as crest, trough, compressions, and rarefactions)

## **Extended standard:**

Ask a prepared question to:

- Identify parts of an electromagnetic and mechanical wave.
- to identify similar qualities of electromagnetic and mechanical waves.
- To identify different qualities of electromagnetic and mechanical waves.

<b>S8P4</b>	<b>Obtain, evaluate, and communicate information to support the claim that electromagnetic (light) waves behave differently than mechanical (sound) waves.</b>
	a. Ask questions to develop explanations about the similarities and differences between electromagnetic and mechanical waves.  (Clarification statement: Include transverse and longitudinal waves and wave parts such as crest, trough, compressions, and rarefactions.)
<b>Least complex</b> ←	→ <b>Most complex</b>

<i>Using the student's primary mode of communication:</i>	<i>Using the student's primary mode of communication:</i>	<i>Using the student's primary mode of communication:</i>	<i>Using the student's primary mode of communication:</i>
Respond differentially to identify questions which will provide information about parts of an electromagnetic wave.  Respond differentially to identify questions which will provide information about parts of a mechanical wave.	Ask a prepared question to identify parts of an electromagnetic and mechanical wave.  Ask a prepared question to identify similar qualities of electromagnetic and mechanical waves.  Ask a prepared question to identify different qualities of electromagnetic and mechanical waves.	Ask two or more prepared questions to identify parts of electromagnetic and mechanical waves.  Ask two or more prepared questions to identify similar qualities of electromagnetic and mechanical waves.  Ask two or more prepared questions to identify differences between electromagnetic and mechanical waves.	Ask one initial and one follow-up question to identify similar qualities of electromagnetic and mechanical waves.  Ask one initial and one follow-up question to identify differences between electromagnetic and mechanical waves.  Ask two or more prepared questions to explain similar qualities of electromagnetic and mechanical waves.  Ask two or more prepared questions to explain differences between

Skills listed are to be utilized within scientific activities and lead to the development of an understanding of a scientific concept within the standard.

# Standards (continued)

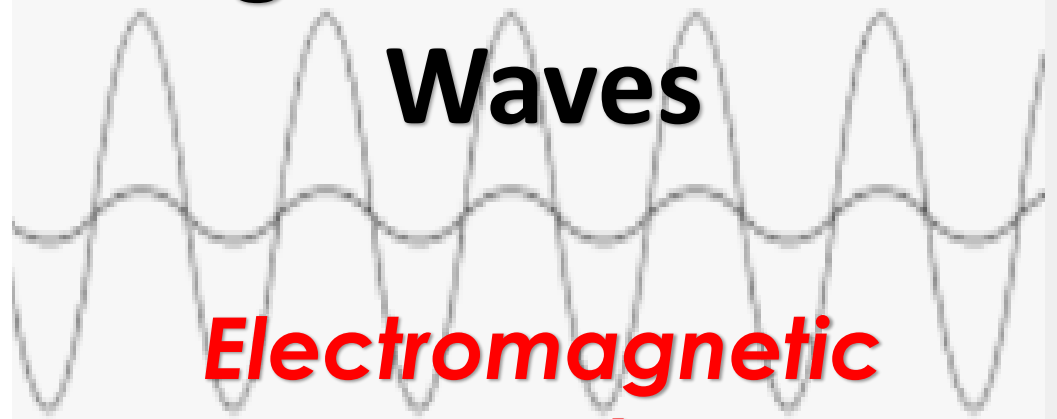
Extended standard from GADOE [www.gadoe.org/Curriculum-Instruction-and-Assessment/Assessment/Documents/GAA\\_2/Extended%20Standards/GAA\\_2.0\\_High\\_School\\_Extended\\_Content\\_Standards\\_08.06.21.pdf](http://www.gadoe.org/Curriculum-Instruction-and-Assessment/Assessment/Documents/GAA_2/Extended%20Standards/GAA_2.0_High_School_Extended_Content_Standards_08.06.21.pdf)

## Next Generation Science Standards for middle and high school

- 4-PS4-1. **Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.** *[Clarification Statement: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves.] [Assessment Boundary: Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.]*
- 4-PS4-2. **Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.** *[Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.]*
- 4-PS4-3. **Generate and compare multiple solutions that use patterns to transfer information.\*** *[Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.]*

<https://www.nextgenscience.org/search-standards?keys=waves&tid%5B%5D=107>

# Light and Sound Waves



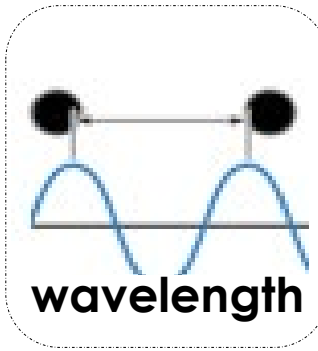
**Electromagnetic  
and  
Mechanical Waves**

## Flipbook

**Directions:** Place the correct answer on the question page.  
Turn the page to see the correct answer.



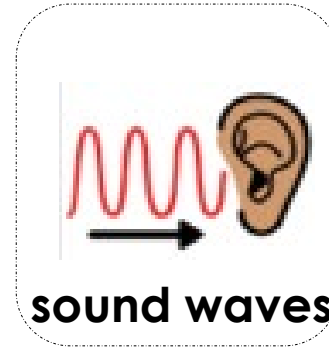
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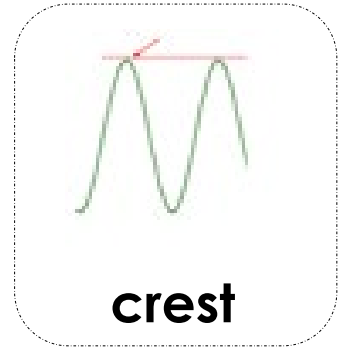
wavelength



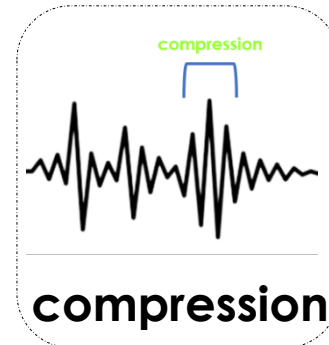
vibrate



sound waves



crest



compression



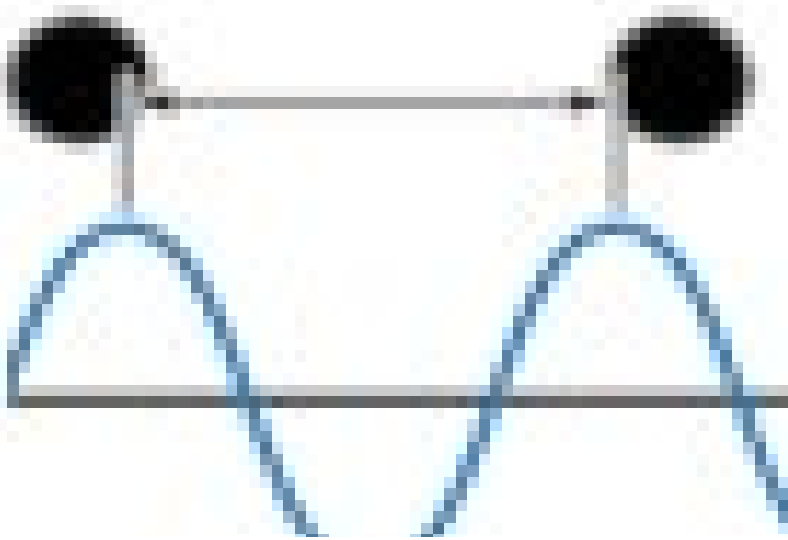
rarefaction

# Line of Best Fit

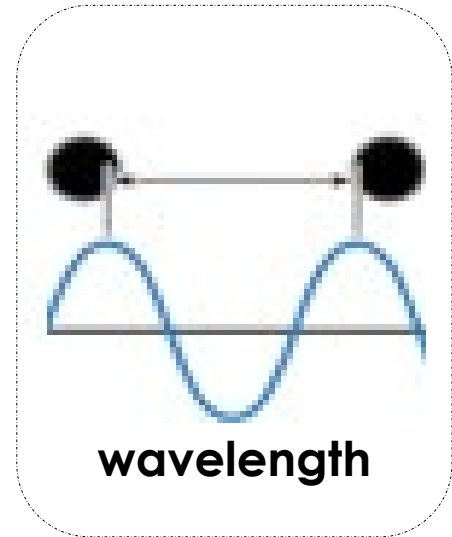
## Flipbook Directions

- Print all pages (2-9) Card stock is not required but it will make the pages more durable over time.
- Laminate pages 2 & 9 as whole pages.
- Pages 3-8 may be trimmed before laminating to save laminate.
- Page 9 will become the back page. Place soft Velcro on the answer squares on each page.
- Page 2 – cut out the title page (large rectangle) – This will become the top/front page.
  - *Cut out each answer card (smaller squares), place hard Velcro on back and attach to soft Velcro on Slide 9.*
- Trim each of the other flip pages (large rectangles) on pages 3-8.
- Place soft Velcro on each answer square on the smaller pages, pages 3-8.
- Punch 2 holes in top of pages so they will align to slide 8 – the back page. You can use a 3-hole punch or handheld punch.
- Stack up pages in numerical order, so that the page with a blank answer square is in front of the explanation page. Place the title page on top.
- Use binder rings to attach pages to back page (slide 9).
- Students can then use the manipulatives on the back page to answer the questions, and then turn to the next page to check their answer.

*The final two pages of this document can be used as a scoring rubric to assign a grade to the student's performance and give the team additional information about scoring for students with complex communication or physical needs.*



This is the distance between wave peaks.



A **wavelength** is the distance between the wave peaks.



A \_\_\_\_\_ is  
when  
vibrating  
particles move  
farther apart.



If the vibrating  
particles move  
farther apart it is  
called **rarefaction**.



To \_\_\_\_\_  
means to  
move back  
and forth.

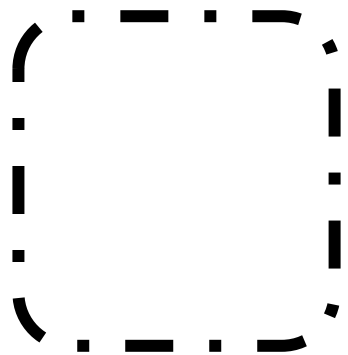


vibrate

When something **vibrates**,  
it makes a sound.

**Vibration** means to move  
something back and  
forth.

compression



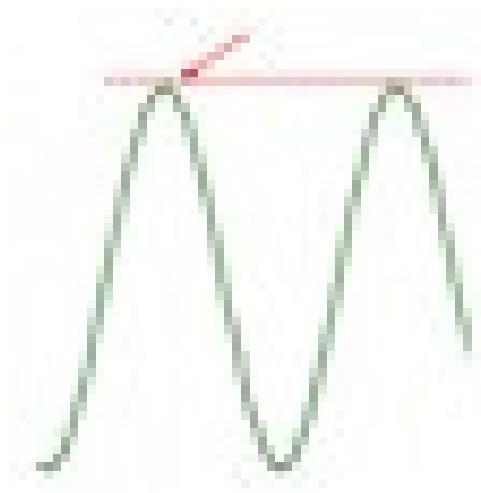
A \_\_\_\_\_ is  
when  
vibrating  
particles move  
close  
together.

compression

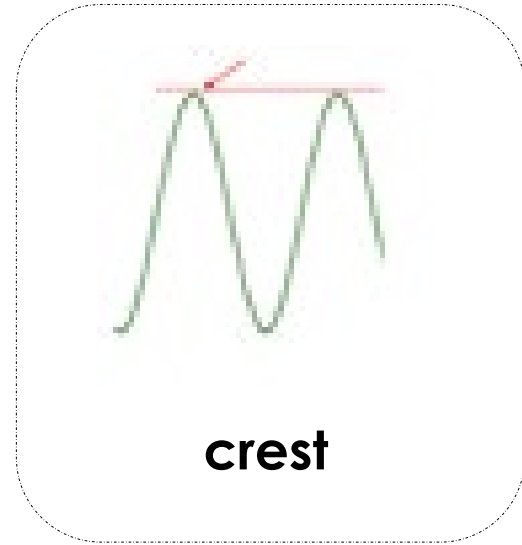


compression

In a sound wave  
sometimes the vibration  
particles move close  
together. These are  
called **compressions**.

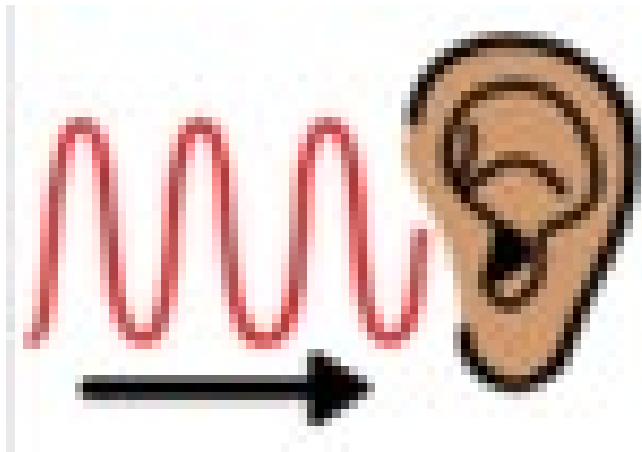


This is the  
highest peak  
of a sound  
wave

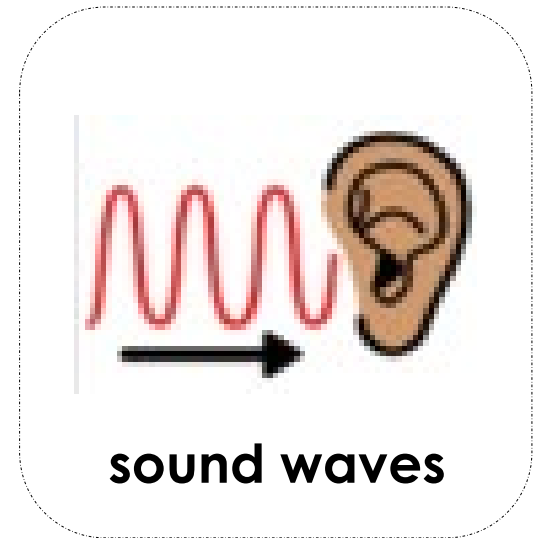


crest

The **crest** is the highest  
peak or peaks of a  
sound wave.



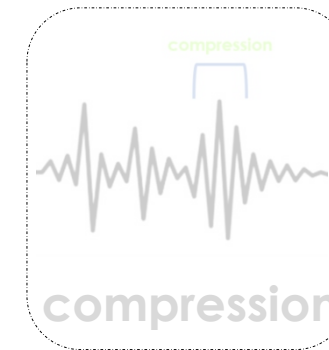
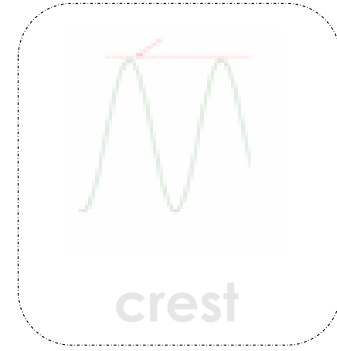
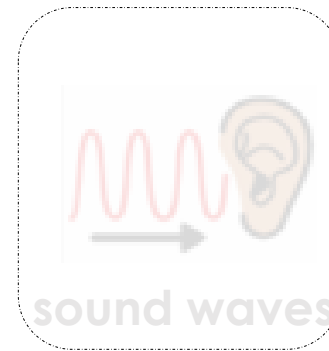
This kind of wave moves back and forth.



**Sound waves** are vibrating energy. Sound waves move back and forth through solids, liquids and gases.

Place soft Velcro on squares and use as placeholders for answers.

**DO NOT CUT PAGE** 



# Assessment Response Templates

## Comprehension Questions: **Light and Sound Waves**

Response/assessment material for students utilizing the GAA 2.0 for repeated practice with this type of formatting.



*AYC&M Academic Series: Juanita Pritchard/DTA Schools*

1. Which word means to move something back and forth?

A

**vibrate**



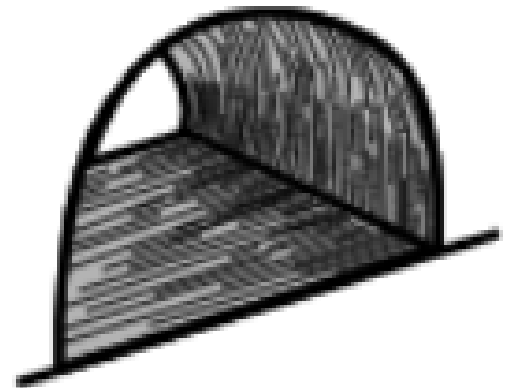
B

**walk**



C

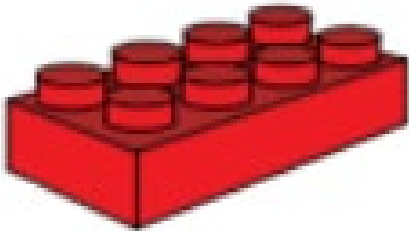
**tunnel**



2. When something vibrates it makes

A

**Legos**



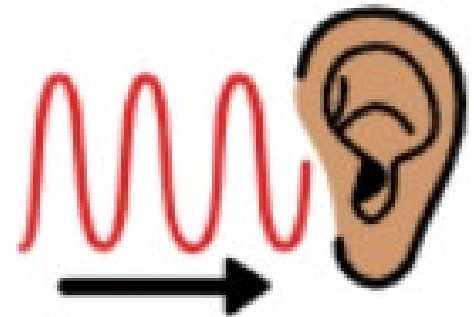
B

**ice cream**



C

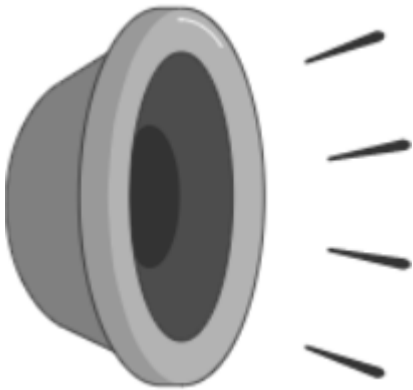
**a sound**



### 3. Light travels in

A

**sound**



B

**radios**



C

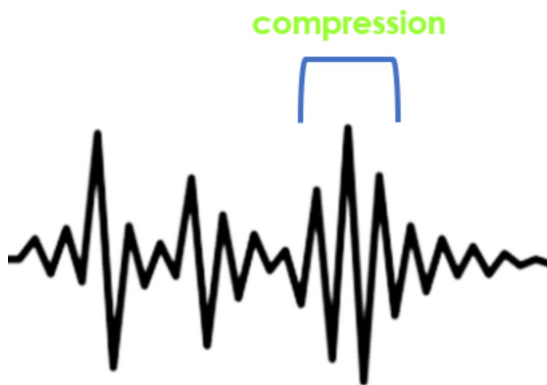
**waves**



4. When vibration particles move close together that part of the wave is called a

A

**compression**



B

**song**

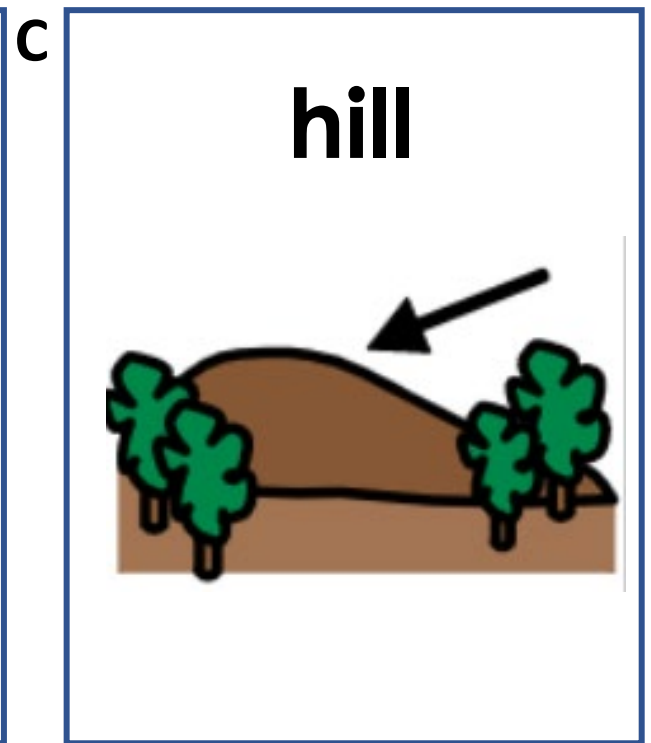
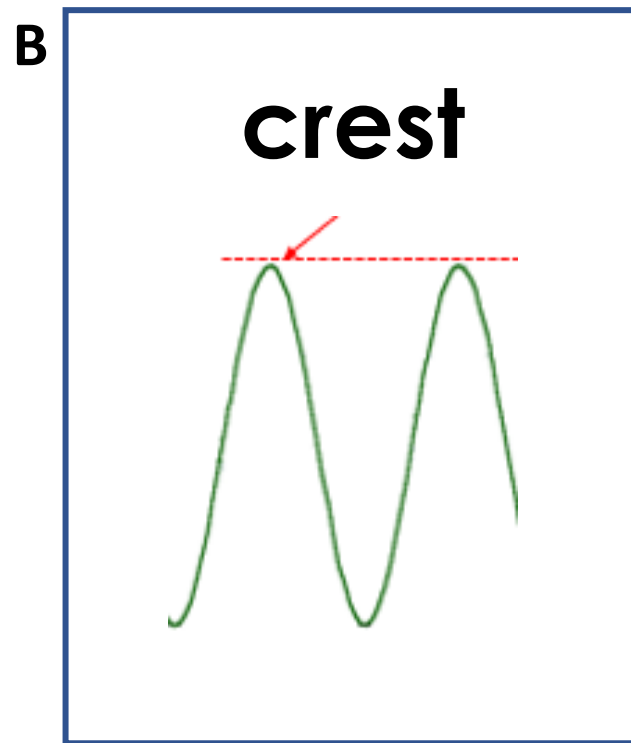
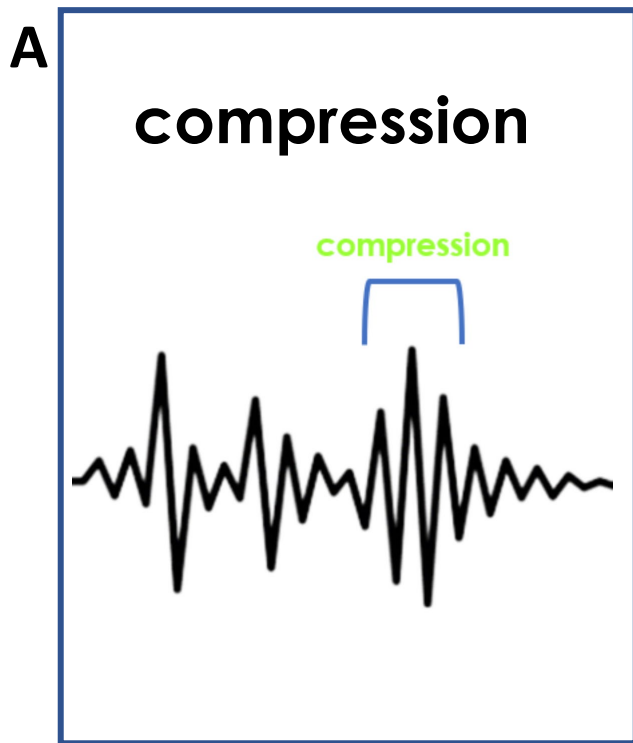


C

**orchestra**



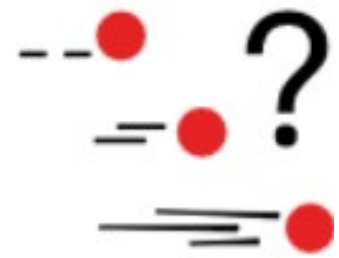
5. The highest peak of a sound wave is called a



6. The lowest peak of a sound wave is called

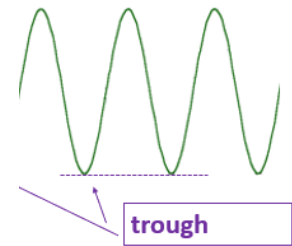
A

**speed**



B

**trough**



C

**science**



7. Which statement below is true?

**A**

**You can see sound waves.**

**B**

**Light waves travel faster than sound waves.**

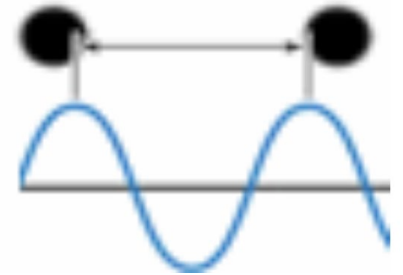
**C**

**You can only find light waves in the ocean.**

8. The distance between the wave peaks is called

A

**wavelength**



B

**Water wave**



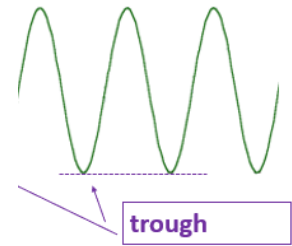
C

**measure**



9. The part of a sound wave where vibrating particles move close together is called

**A** **trough**



**B** **wave**



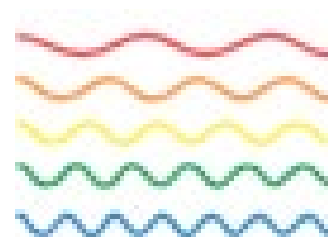
**C** **rarefaction**



10. When something vibrates, it makes a

A

**Light wave**



B

**sound**



C

**recipe**



# Answer Key: Light & Sound Waves

AYC&M Academic Series: Juanita Pritchard/DTA Schools

- Which word means to move something back and forth?
  - a) vibrate**
  - b) walk
  - c) tunnel
- What does accelerate mean?
  - a. Lego
  - b. ice cream
  - c. A sound**
- Light travels in
  - a. Sound
  - b. Radios
  - c. Waves**
- When vibration particles move close together that part of the wave is called a
  - a. compression**
  - b. song
  - c. Orchestra
- The highest peak of a sound wave is called a
  - a. compression
  - b. crest**
  - c. hill
- The lowest peak of a sound wave is called
  - a. Speed
  - b. Trough**
  - c. science
- Which statement below is true?
  - a. You can see sound waves.
  - b. Light waves travel faster than sound waves**
  - c. You can only find light waves in the ocean.
- The distance between wave peaks is called
  - a. wavelength**
  - b. Water wave
  - c. measure
- The part of a sound wave where vibrating particles move closer together is called
  - a. trough
  - b. wave
  - c. Rarefaction**
- When something vibrates it makes a
  - a. Light wave
  - b. sound**
  - c. recipe

# Light and Sound Waves

*Electromagnetic  
and  
Mechanical Waves*

## Activity 1



AYC&M Academic Series: Juanita Pritchard/DTA Schools

# Label the Wave

## Differentiated Activity

This activity is scaffolded to provide additional support if needed.

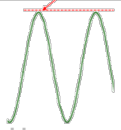
Level 1 – Visual cue on diagram and label so student can match

Level 2 – Definition provided; student located correct word

Level 3 – Independent, word and definition

Name \_\_\_\_\_ Date \_\_\_\_\_

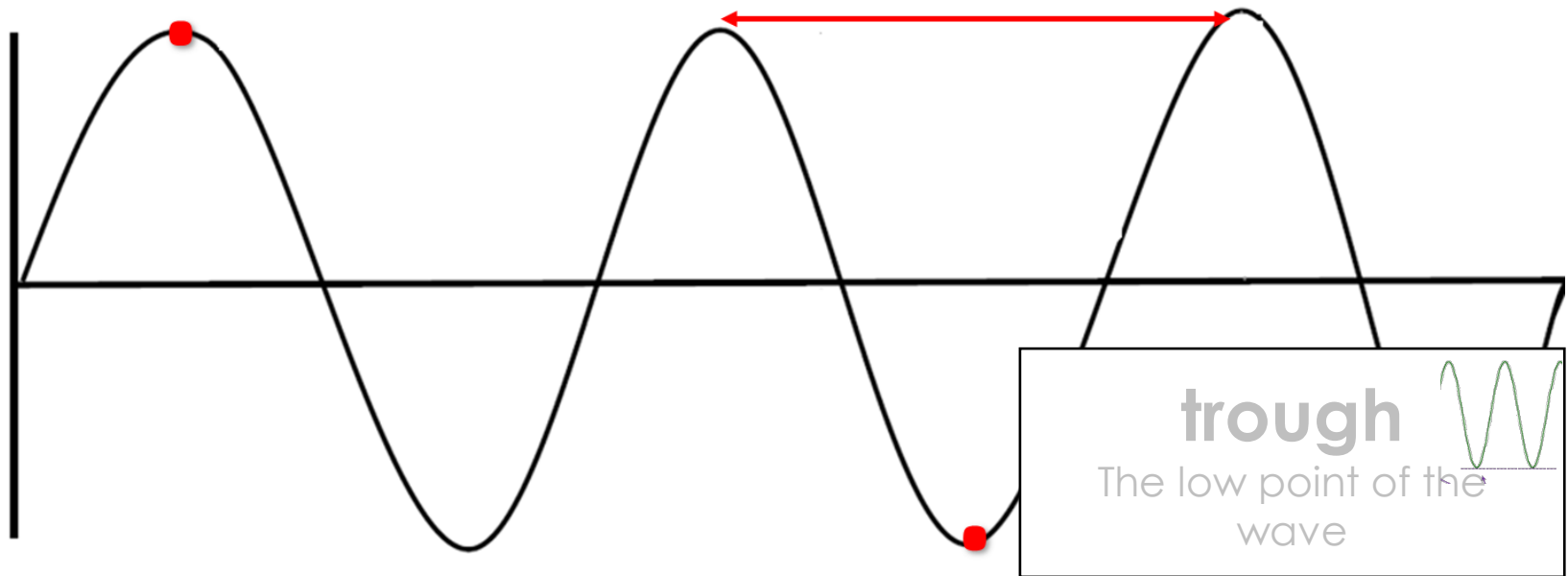
Use the word boxes below to label each area of the wave:

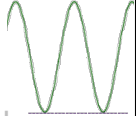
**crest** 

The high point of the wave

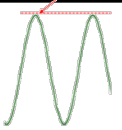
**wavelength** 

The distance between one crest to the next

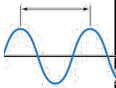


**trough** 

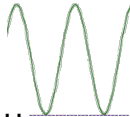
The low point of the wave

**crest** 

The high point of the wave

**wavelength** 

The distance between one crest to the next

**trough** 

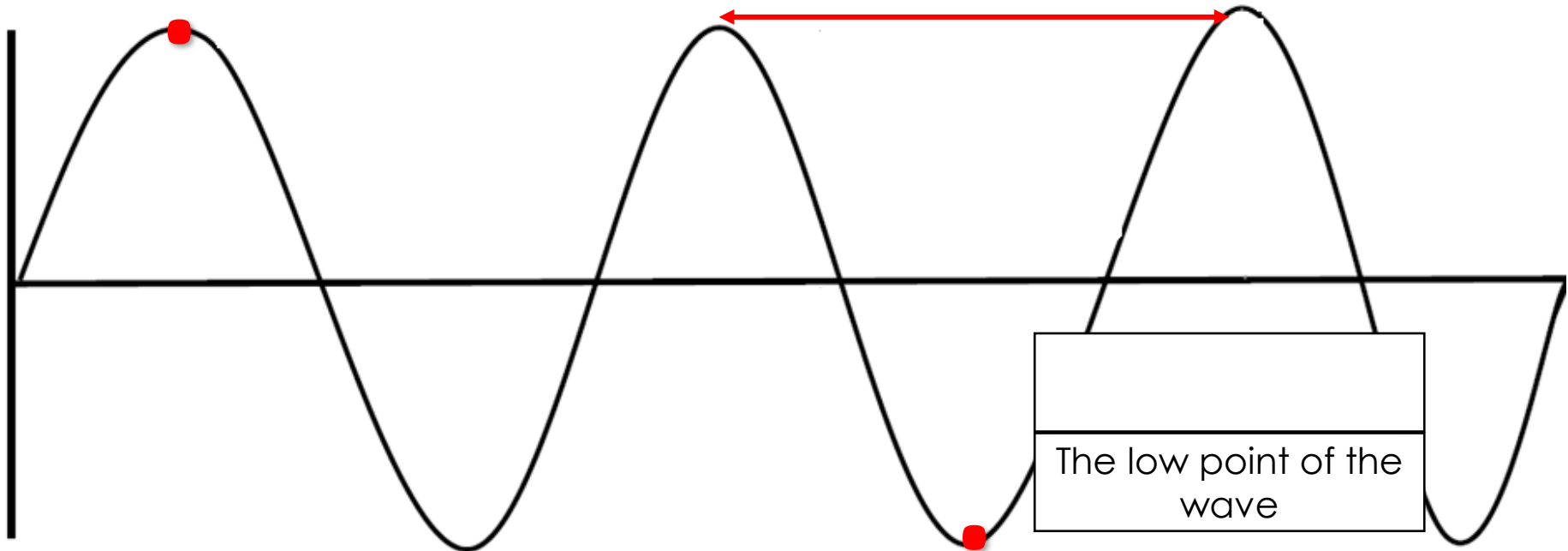
The low point of the wave

Name \_\_\_\_\_ Date \_\_\_\_\_

Use the word boxes below to label each area of the wave:

The high point of the wave

The distance between one crest to the next

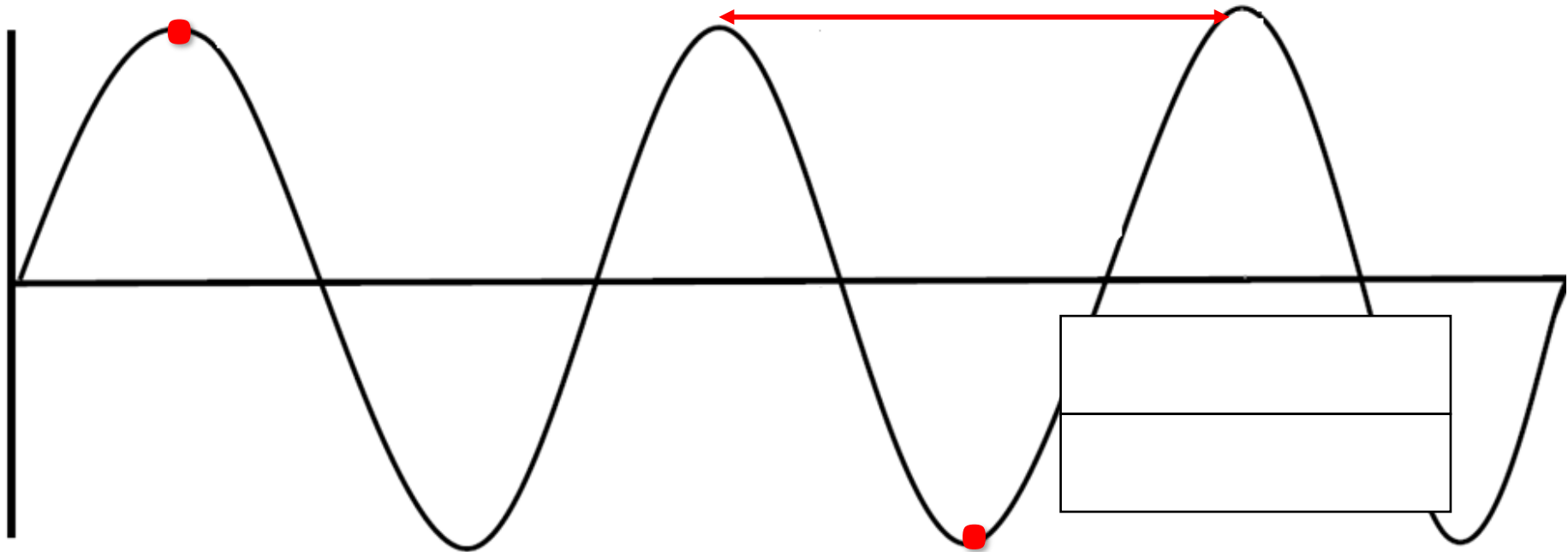


<b>trough</b>	<b>crest</b>	<b>wavelength</b>
---------------	--------------	-------------------

Name \_\_\_\_\_ Date \_\_\_\_\_

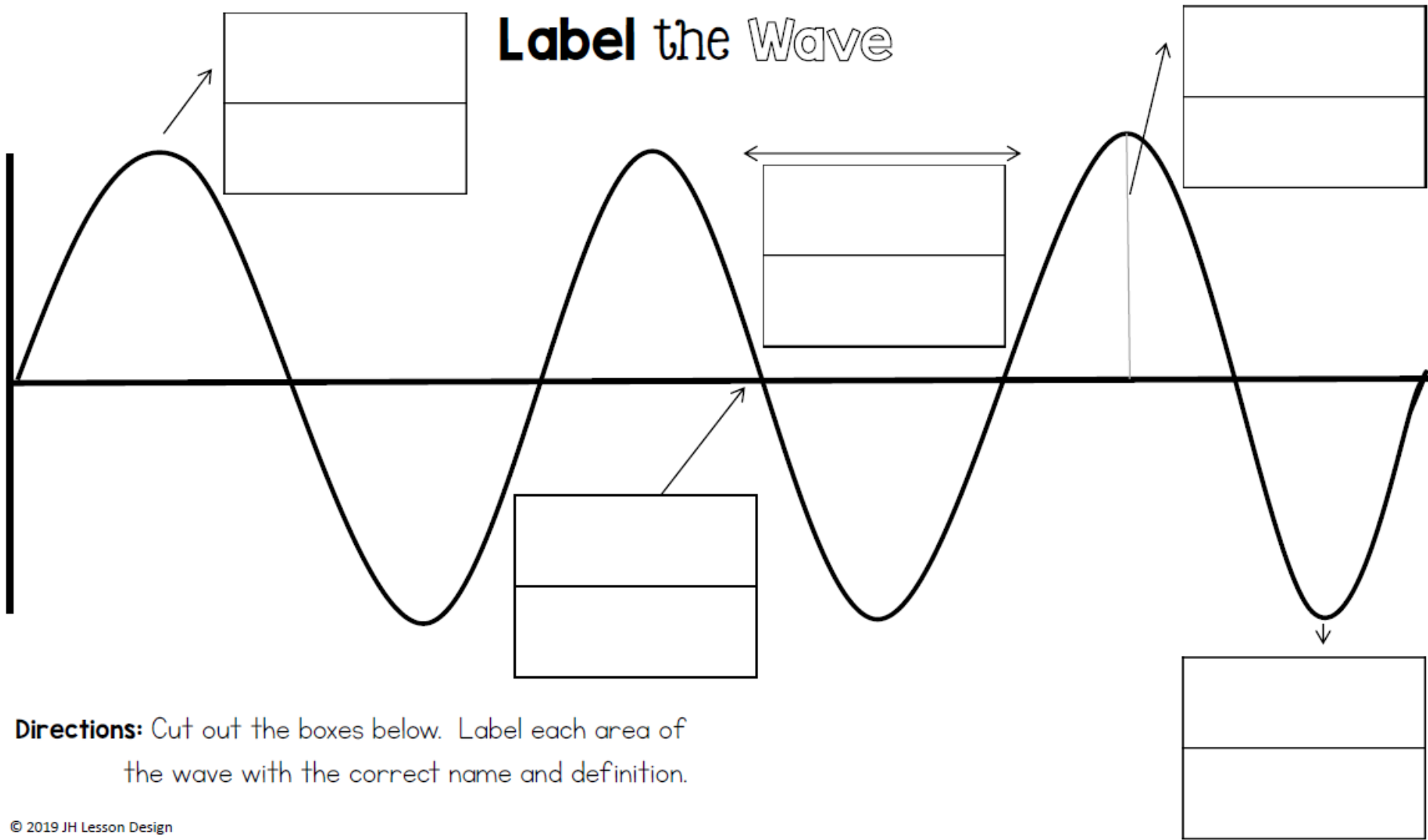
Use the word boxes below to label each area of the wave:





<b>trough</b>	The distance between one crest to the next	<b>wavelength</b>
<b>crest</b>	The high point of the wave	The low point of the wave

## Label the Wave



**Directions:** Cut out the boxes below. Label each area of the wave with the correct name and definition.

# Light and Sound Waves

*Electromagnetic  
and  
Mechanical Waves*

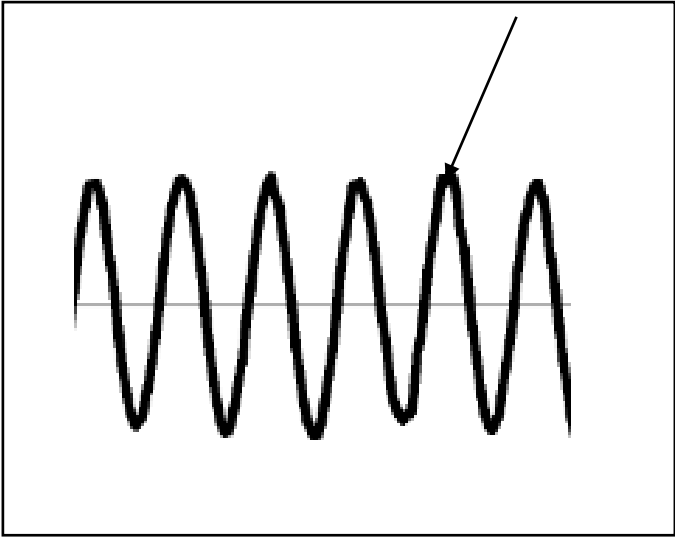
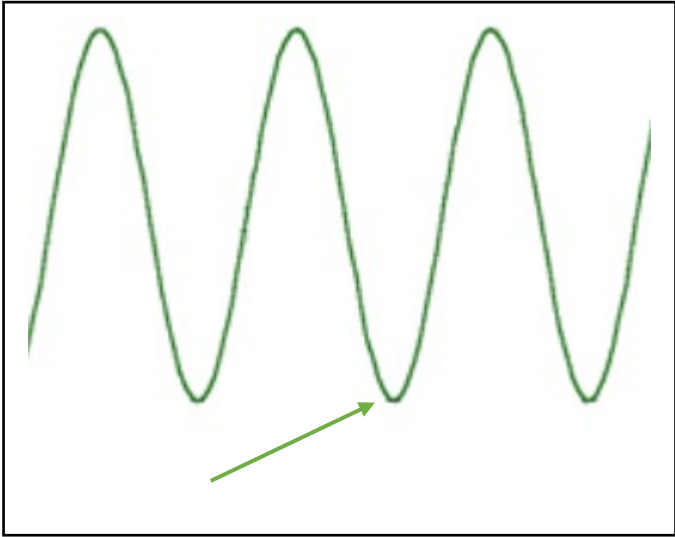
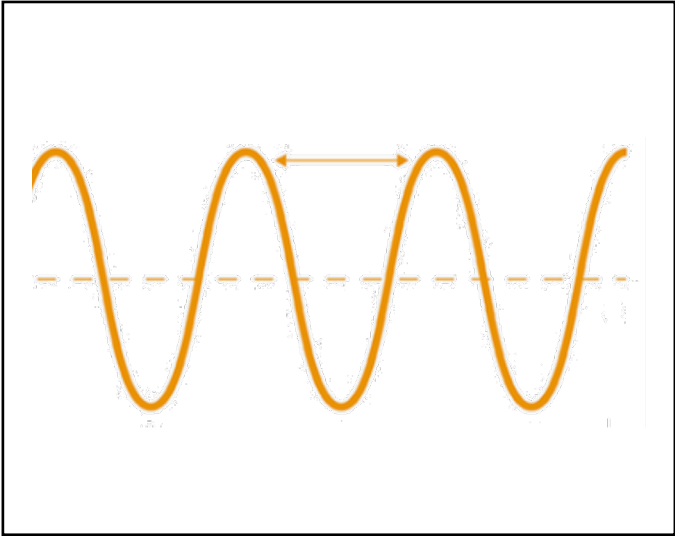
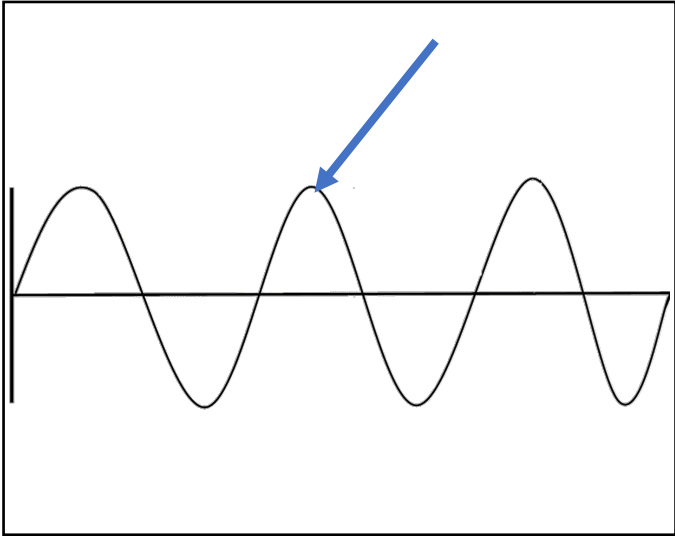
## Activity 2



AYC&M Academic Series: Juanita Pritchard/DTA Schools

Name \_\_\_\_\_ Date \_\_\_\_\_

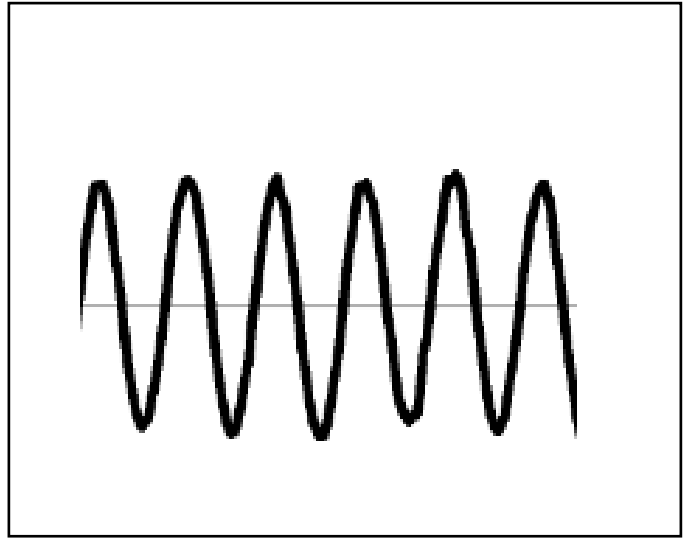
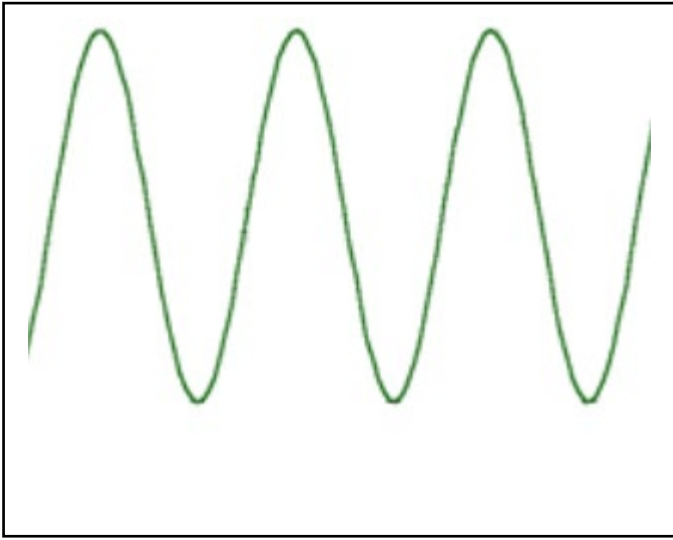
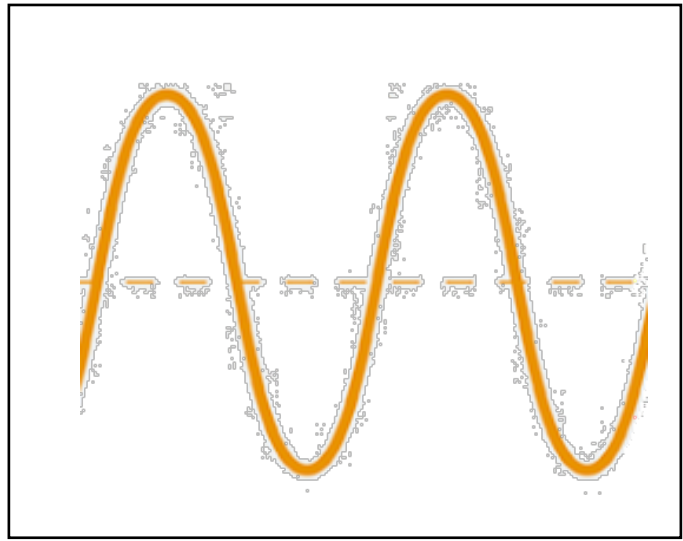
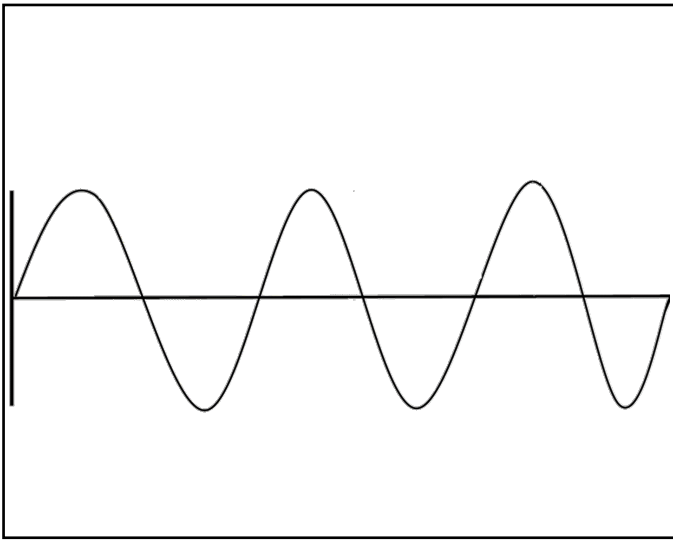
Put an 'X' on the boxes that have correctly marked a wave crest.



Name \_\_\_\_\_

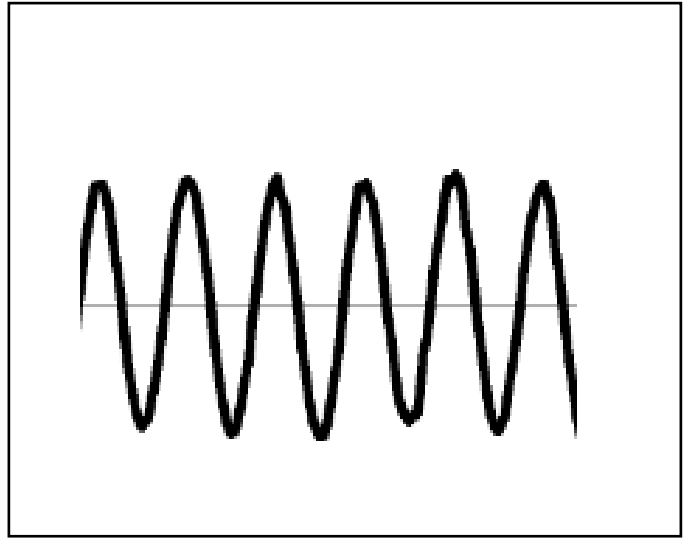
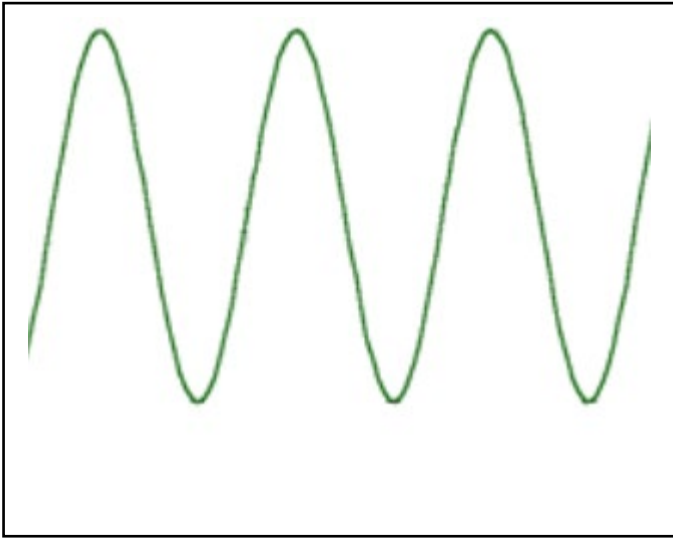
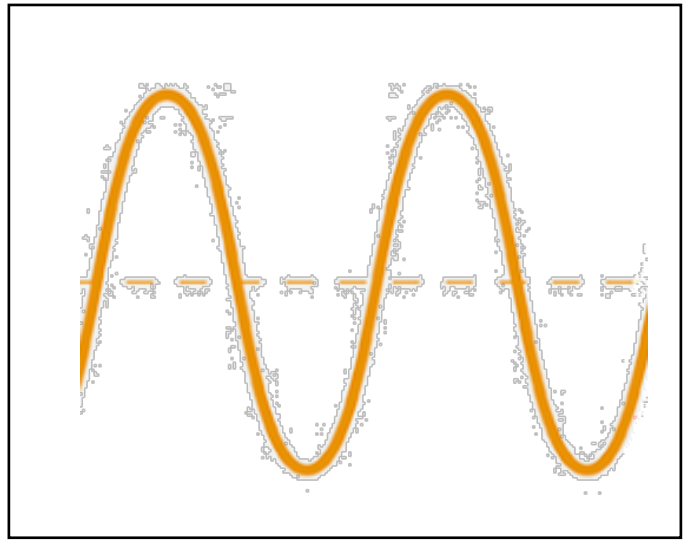
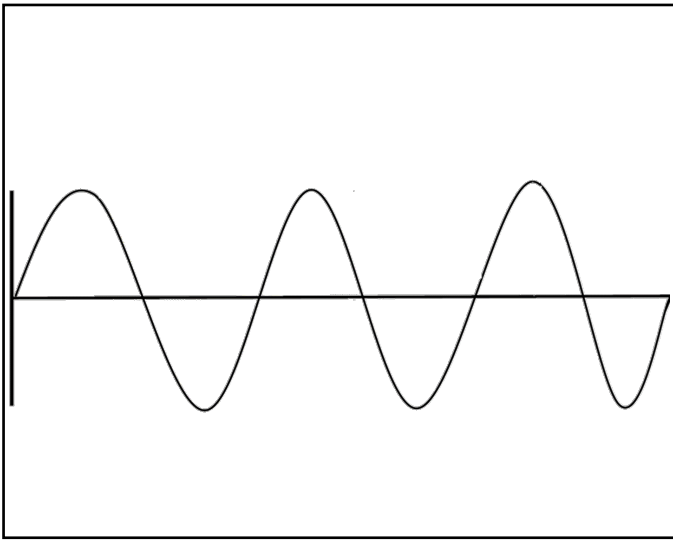
Date \_\_\_\_\_

Put an 'X' on a trough on each wave.



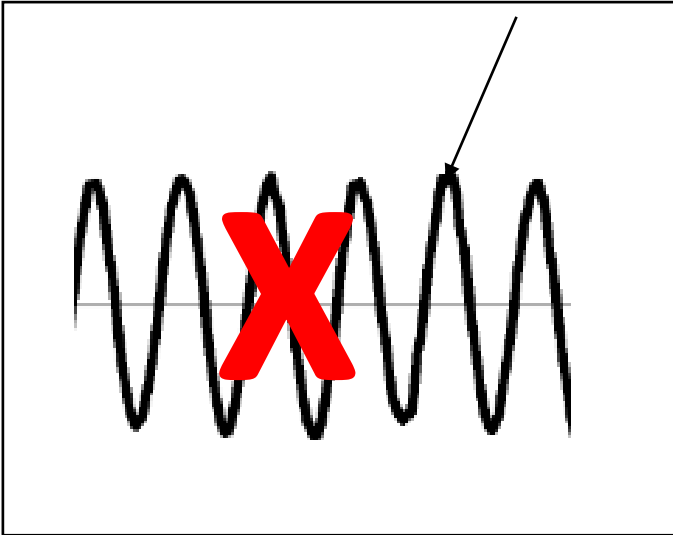
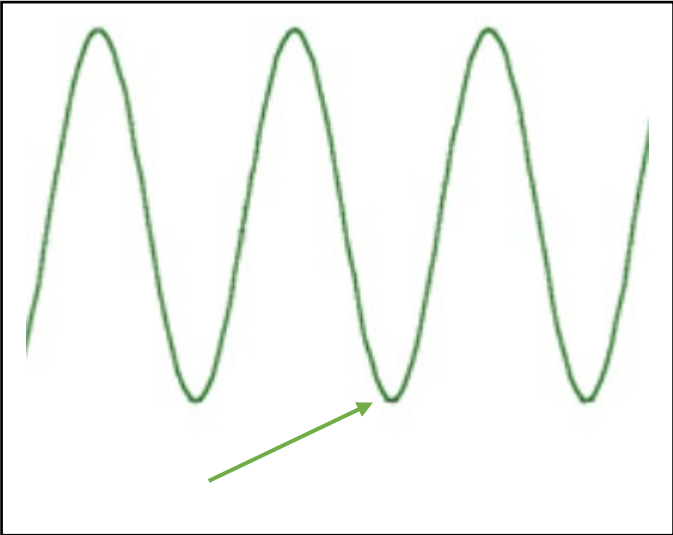
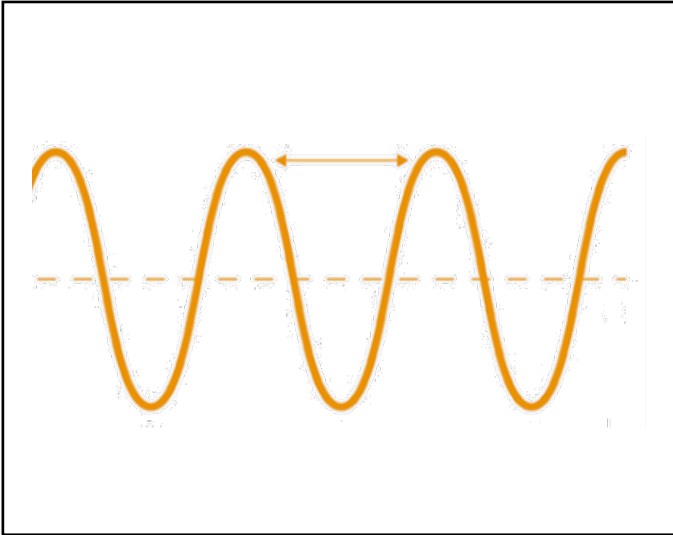
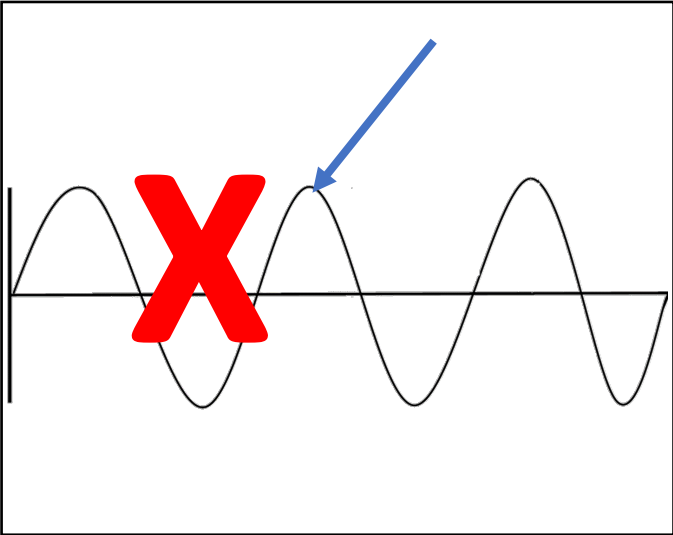
Name \_\_\_\_\_ Date \_\_\_\_\_

Draw a line to show a wavelength on each wave.



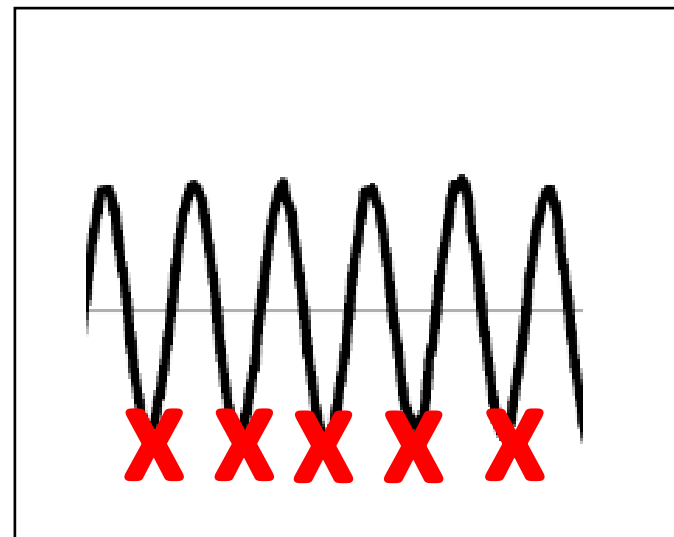
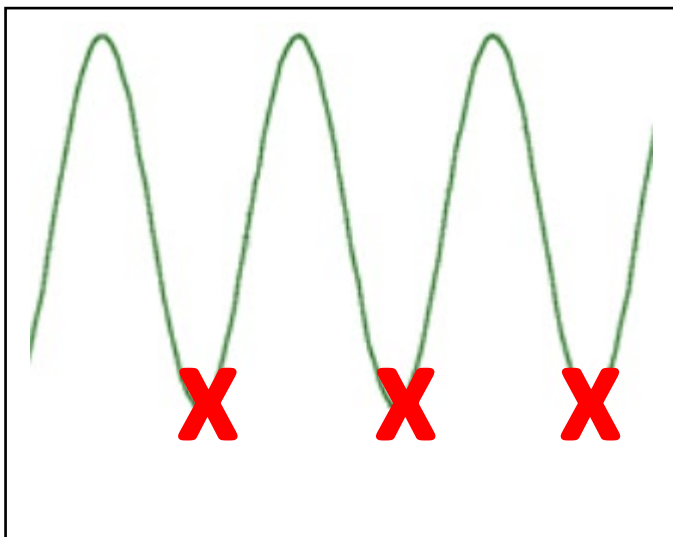
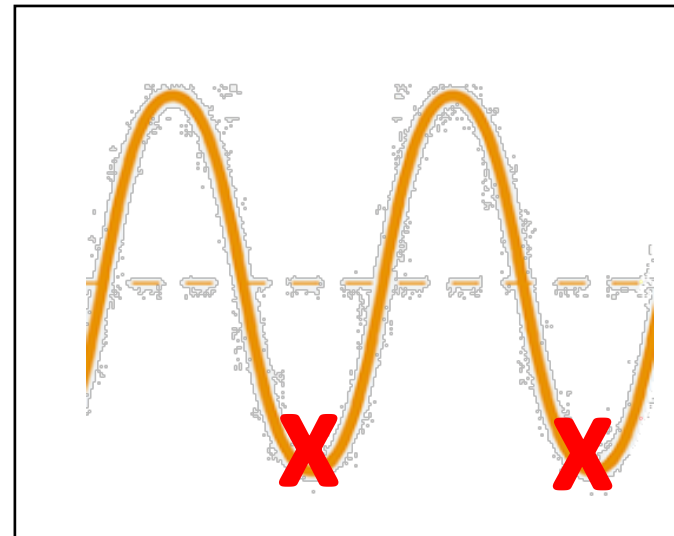
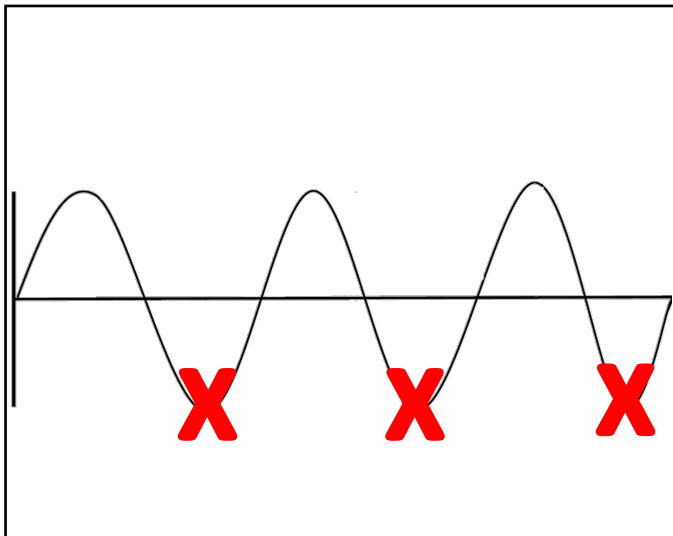
ANSWER KEY

Put an 'X' on the boxes that have correctly marked a wave crest.



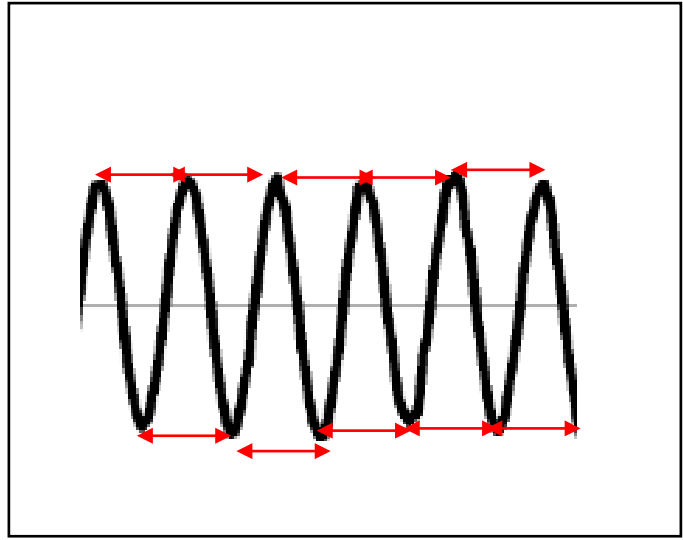
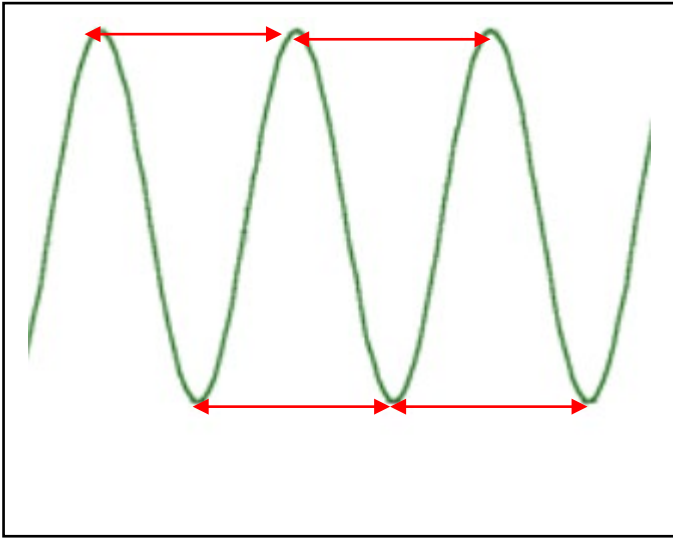
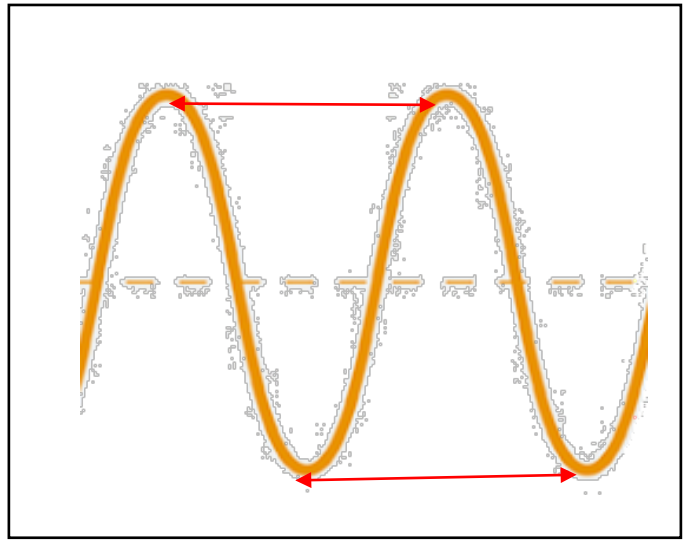
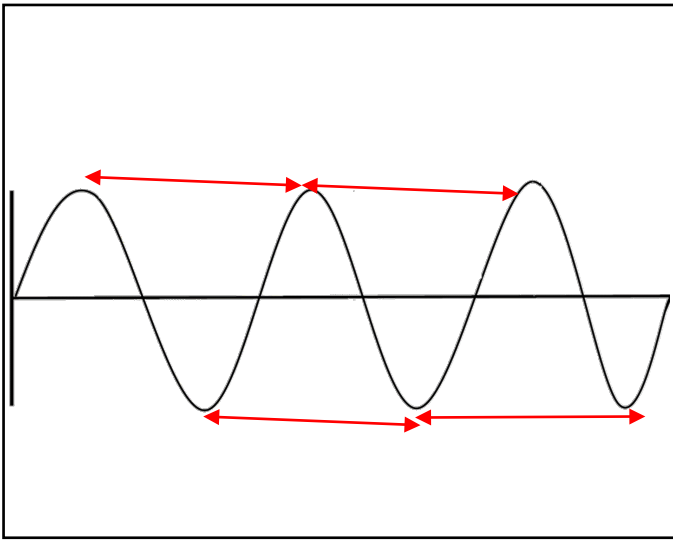
ANSWER KEY: there can be multiple correct answers – any of the Xs below are troughs – student was only asked to identify 1 on each wave.

Put an 'X' on a trough on each wave.

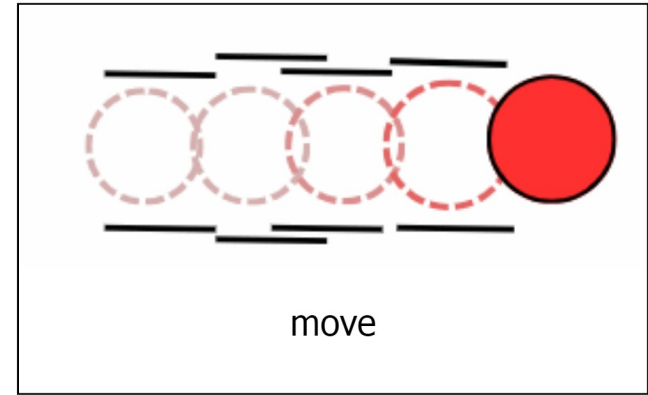
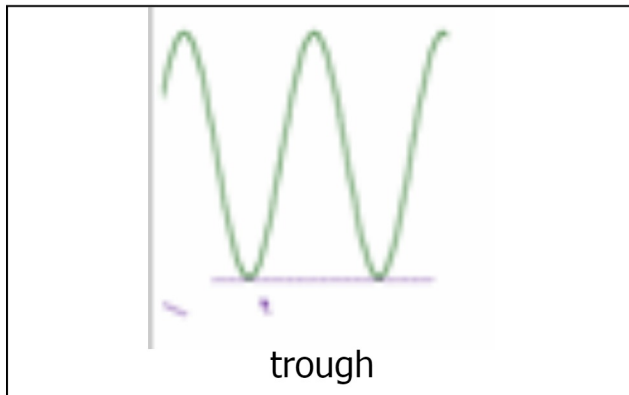
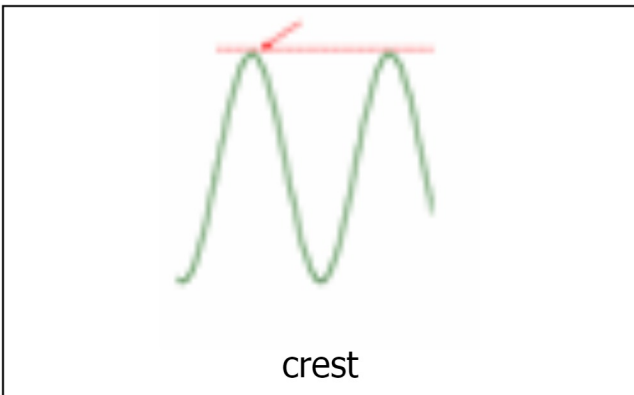
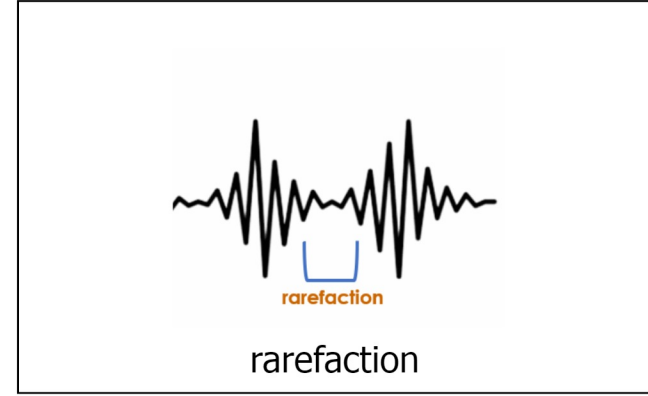
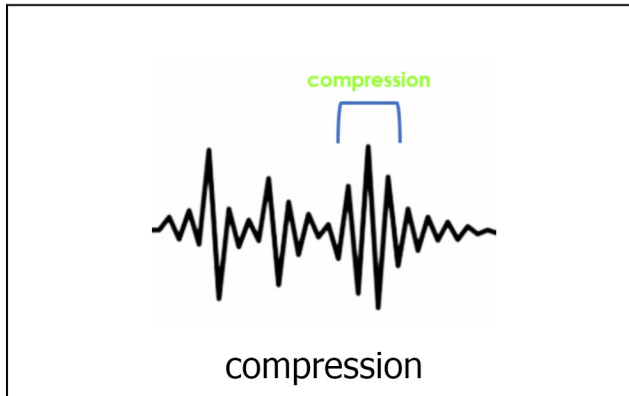
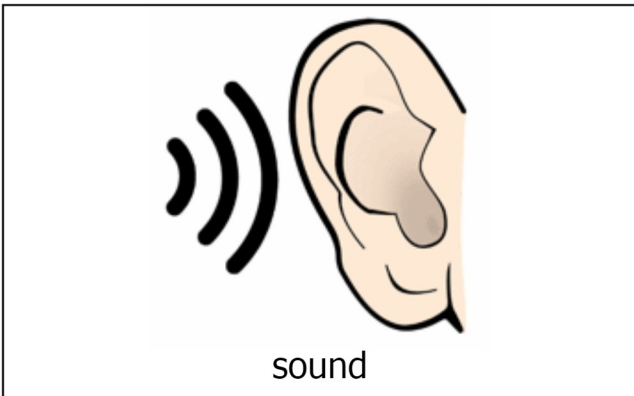
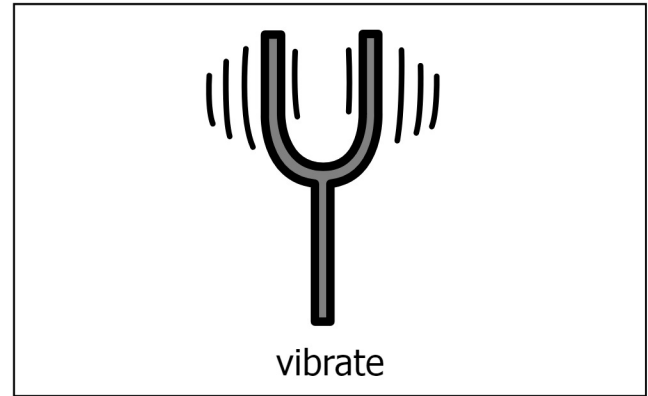
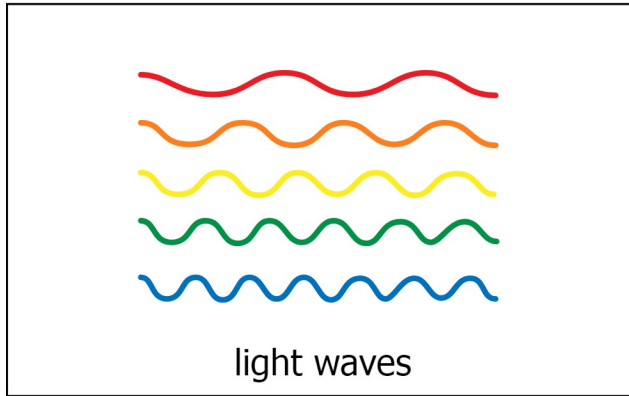
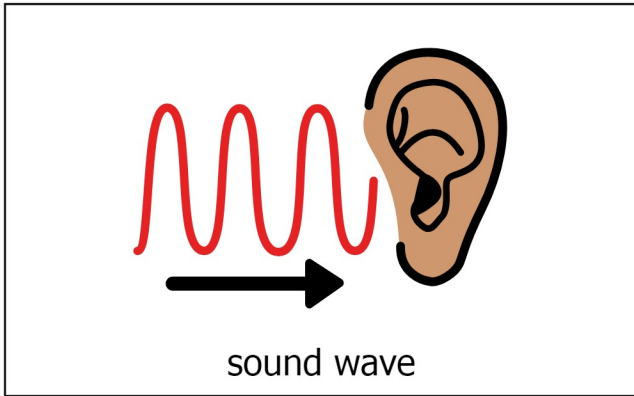


ANSWER KEY: there can be multiple correct answers – any of the arrows below are wavelengths – student was only asked to identify 1 on each wave.

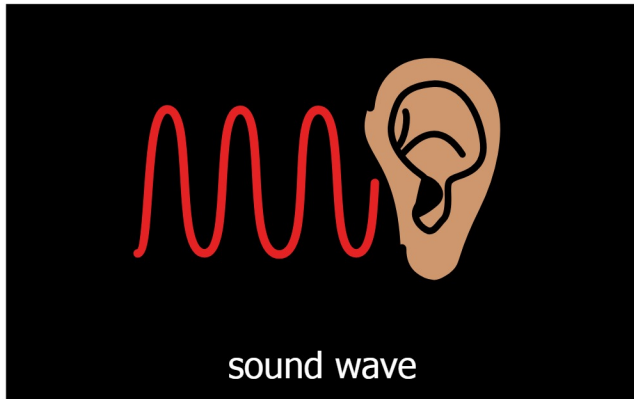
Draw a line to show a wavelength on each wave.



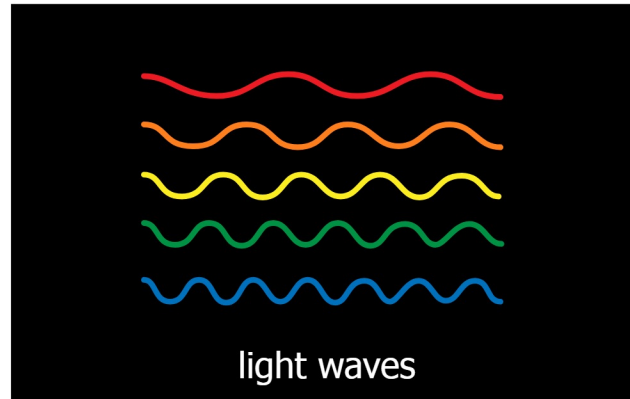
# Light & Sound Waves PCS Communication Boards 9 Loc



# Light & Sound Waves PCS Communication Boards 9 Loc



sound wave



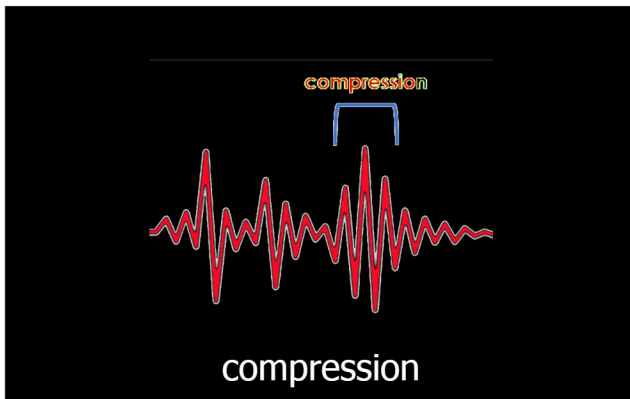
light waves



vibrate



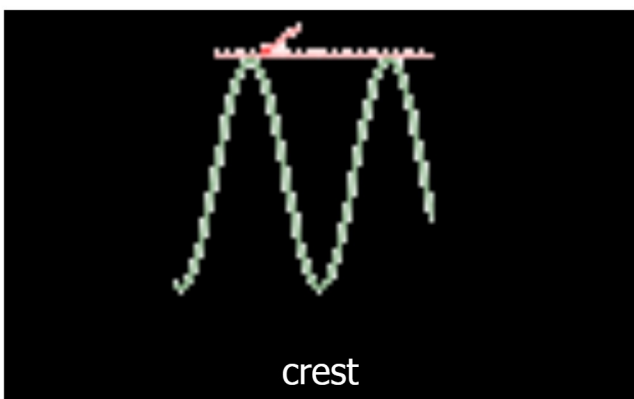
sound



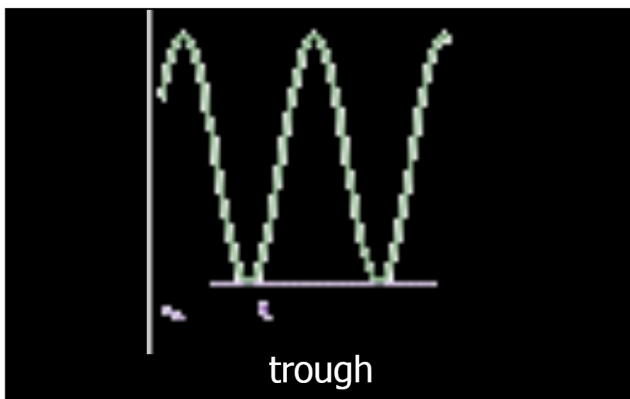
compression



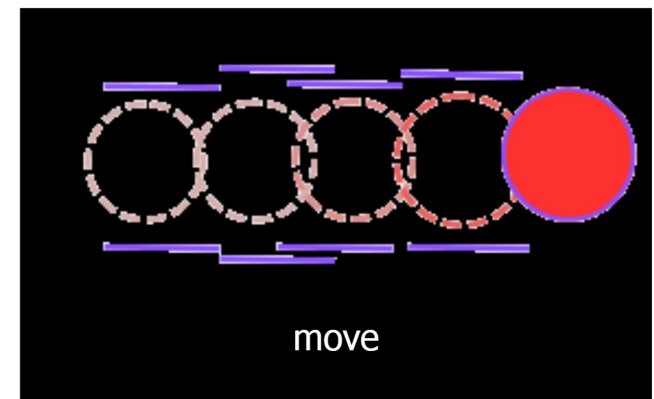
rarefaction



crest

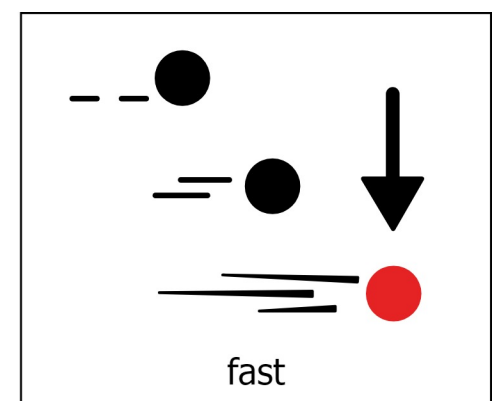
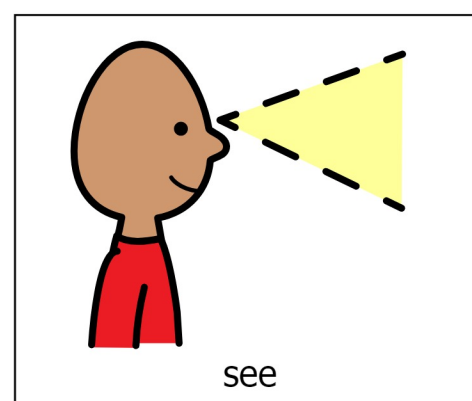
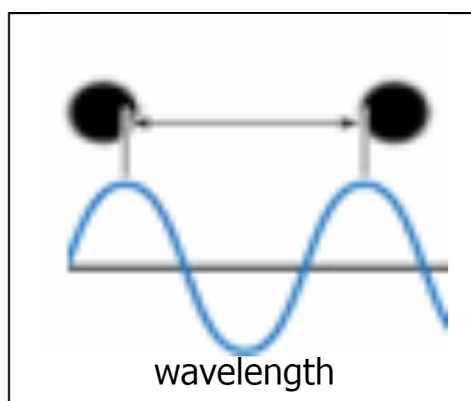
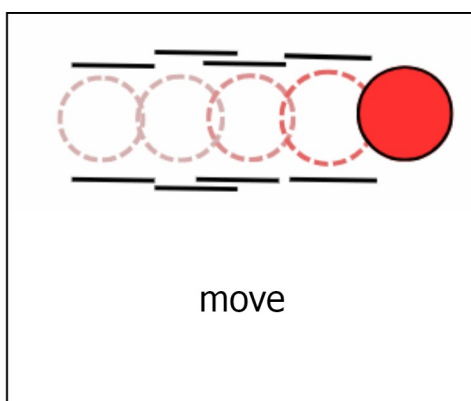
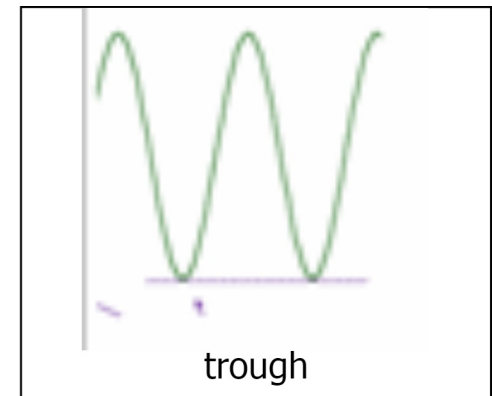
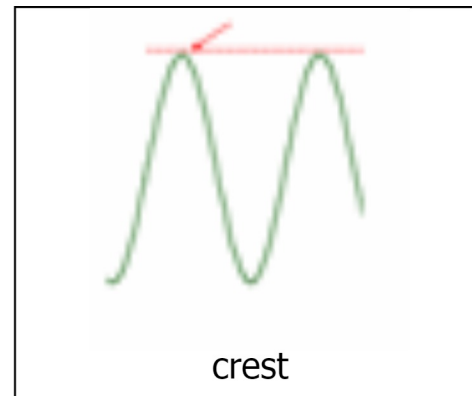
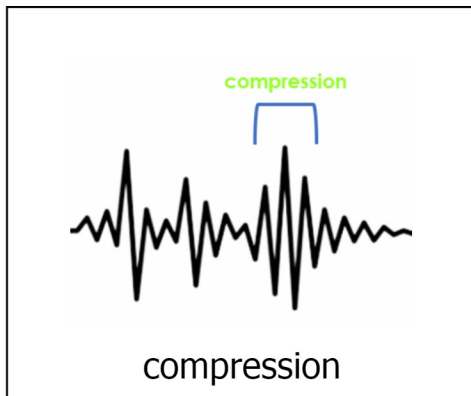
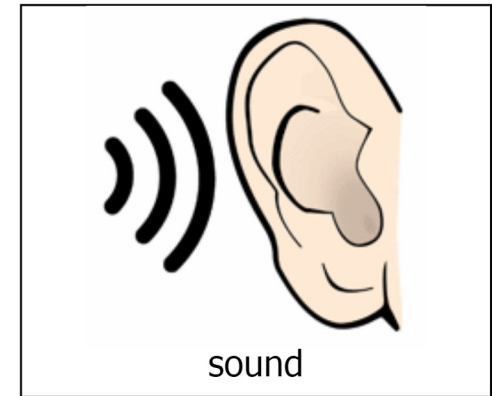
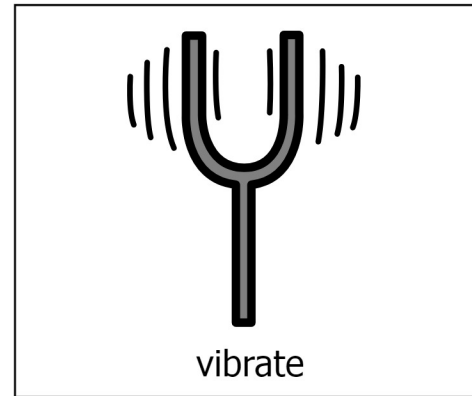
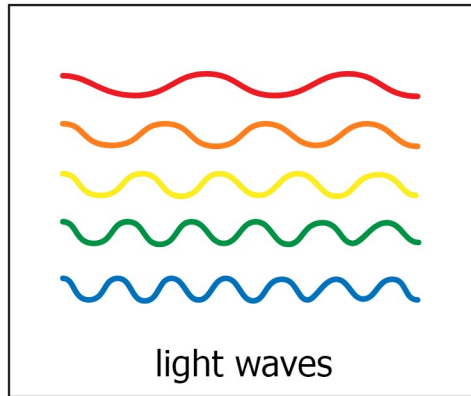
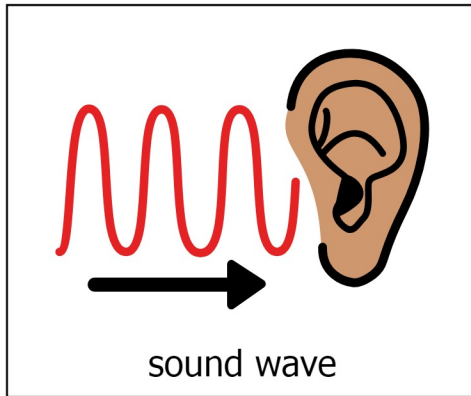


trough

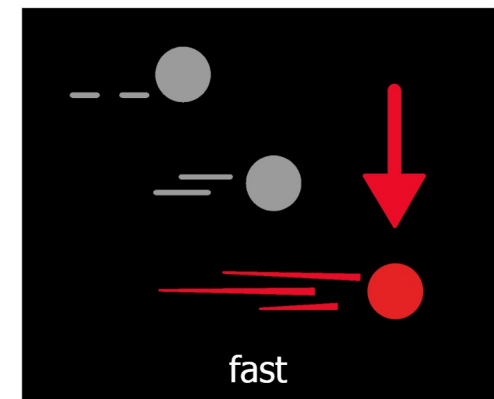
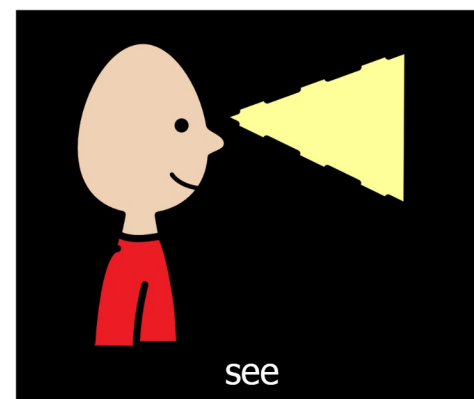
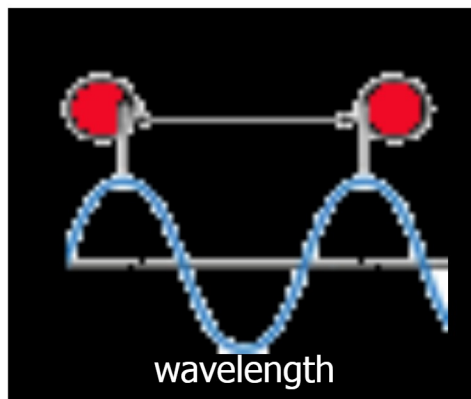
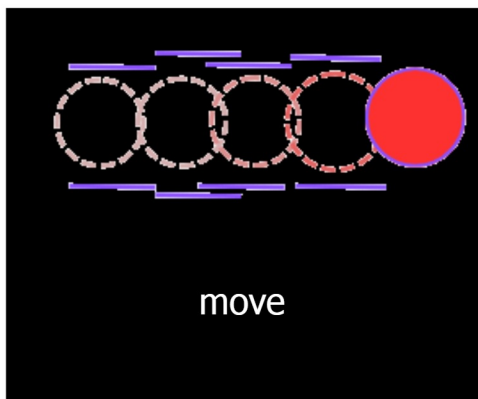
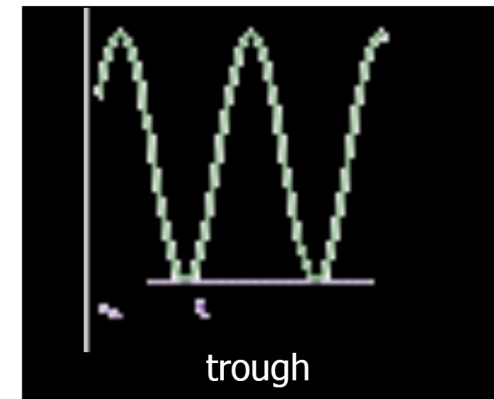
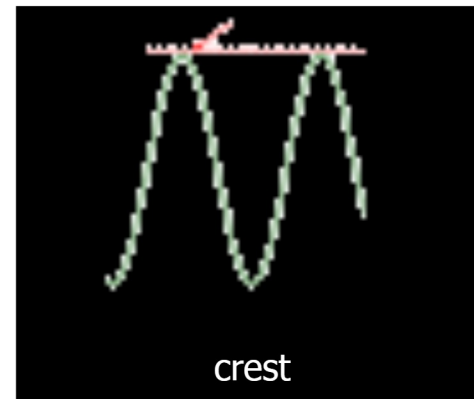
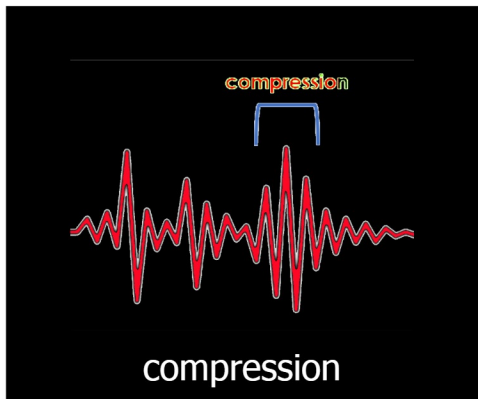
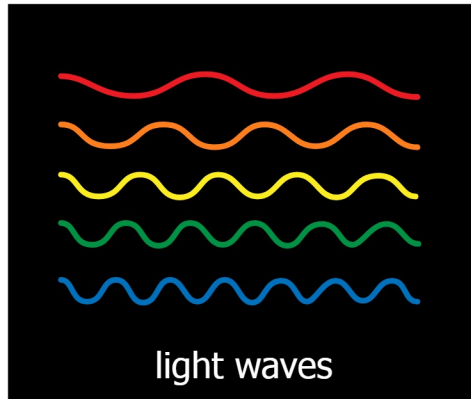
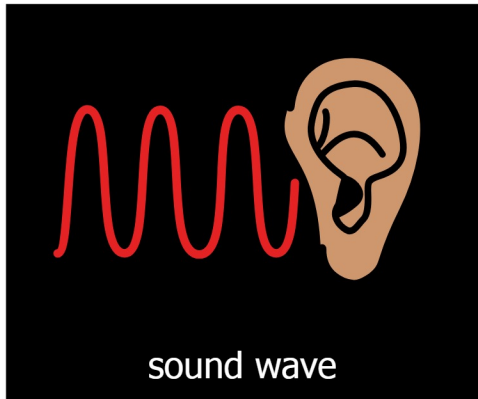


move

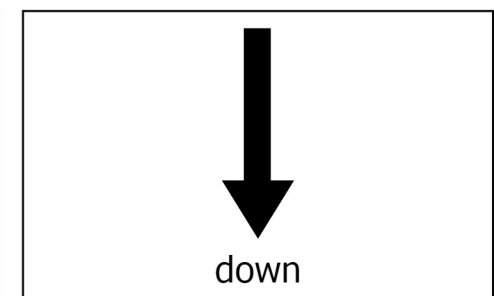
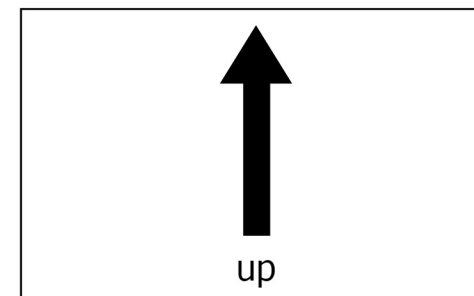
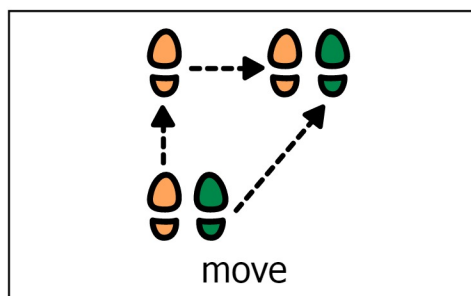
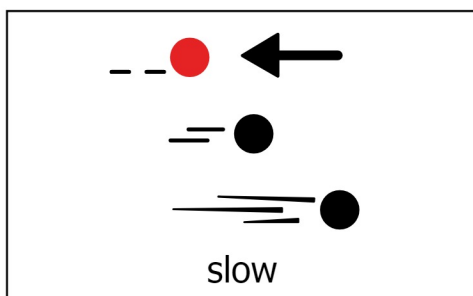
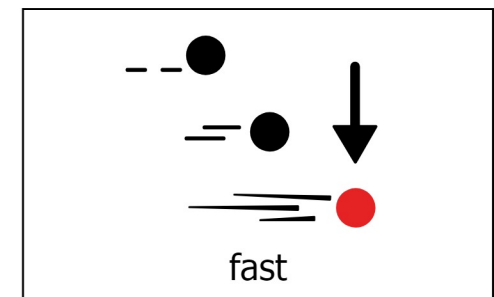
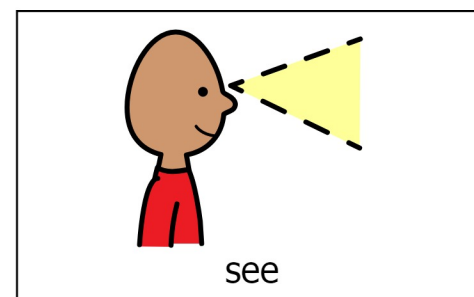
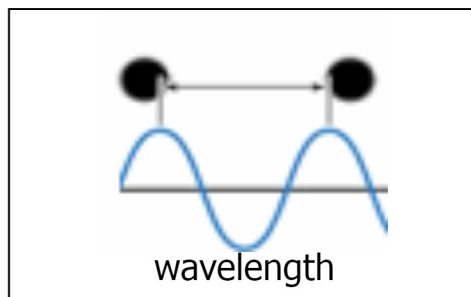
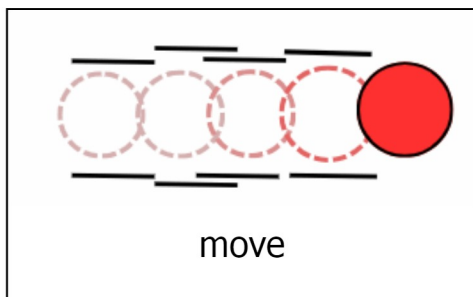
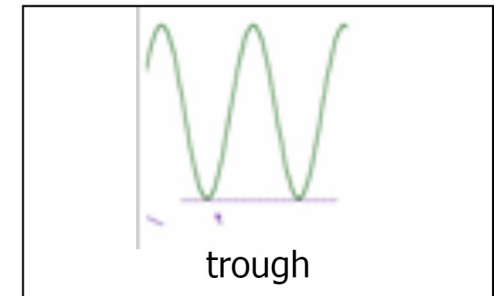
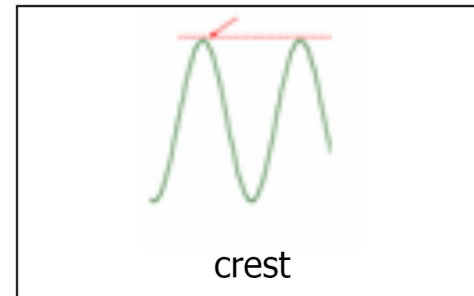
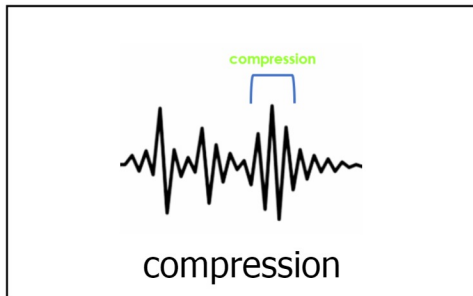
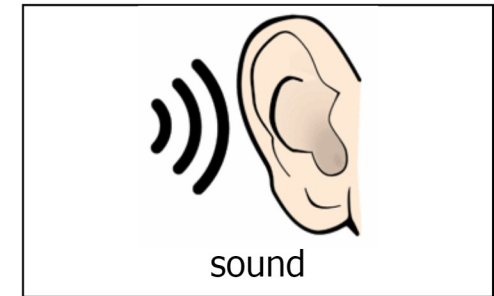
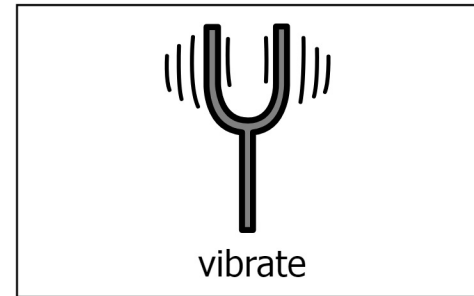
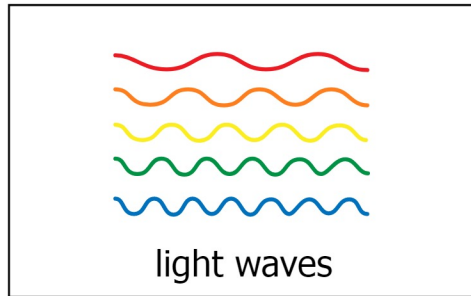
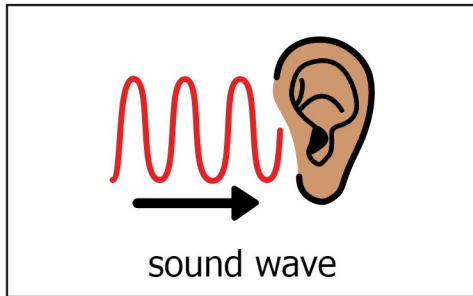
# Light & Sound Waves PCS Communication Boards 12 Loc



# Light & Sound Waves PCS Communication Boards 12 Loc



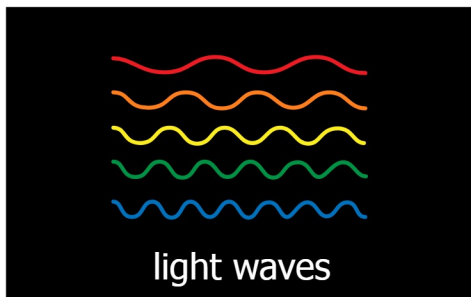
# Light & Sound Waves PCS Communication Boards 16 Loc



# Light & Sound Waves PCS Communication Boards 16 Loc



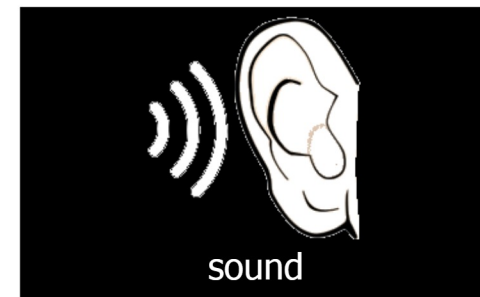
sound wave



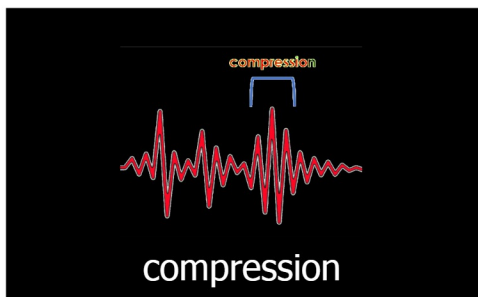
light waves



vibrate



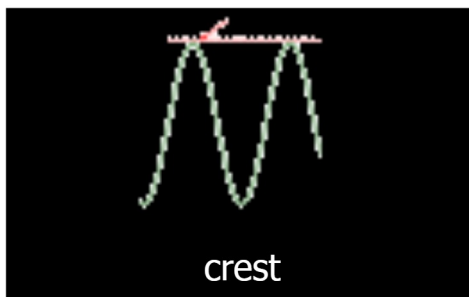
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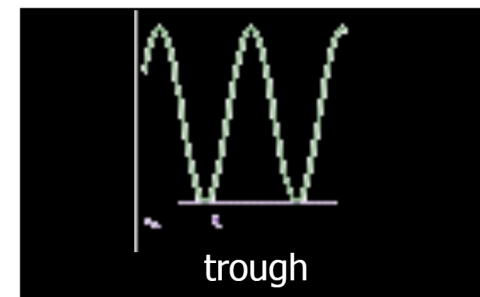
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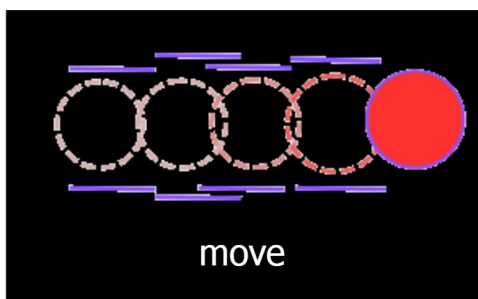
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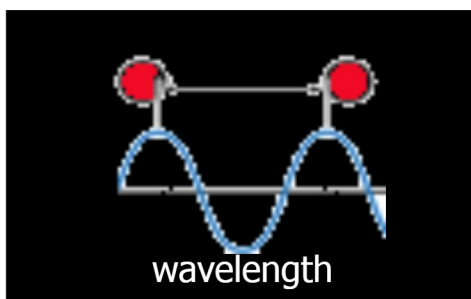
crest



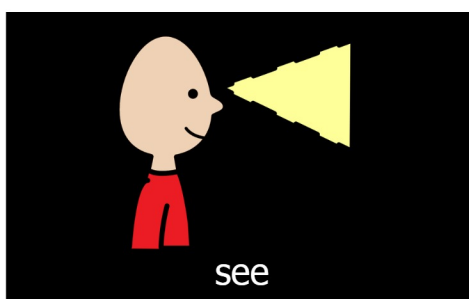
trough



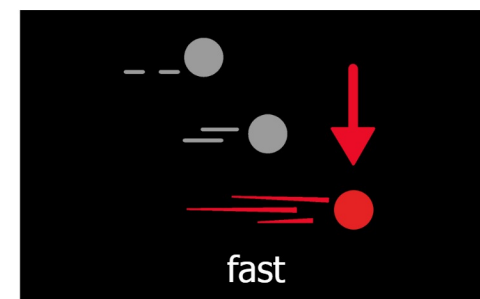
move



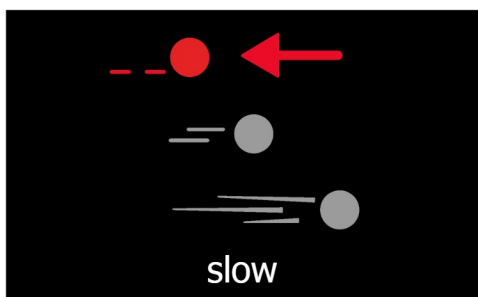
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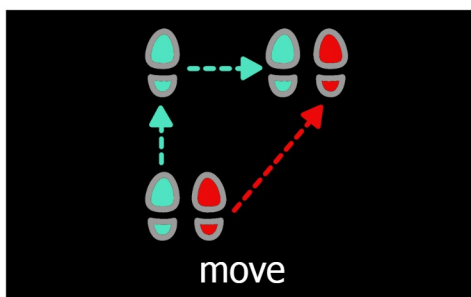
see



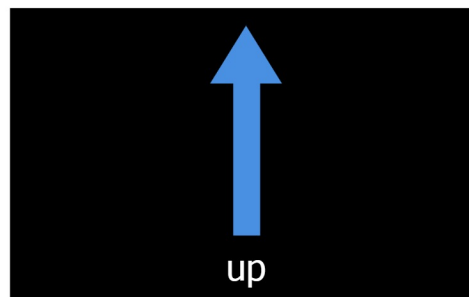
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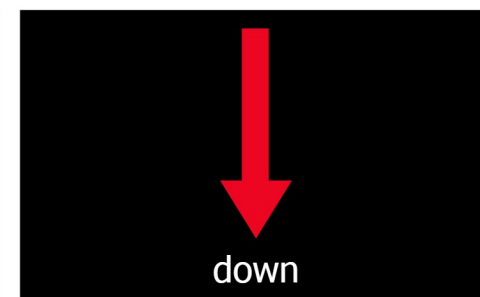
slow



move

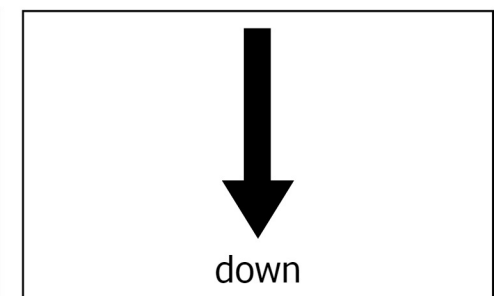
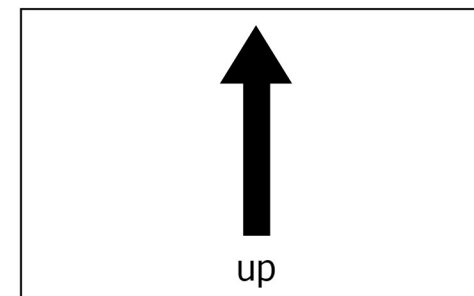
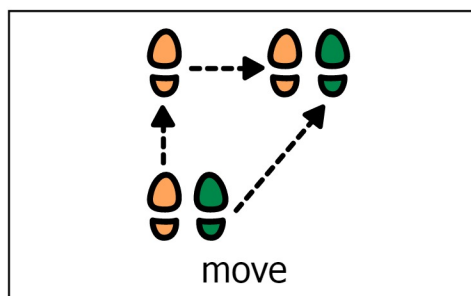
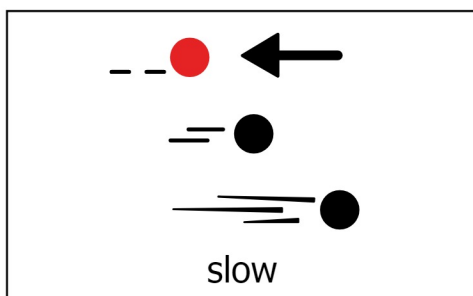
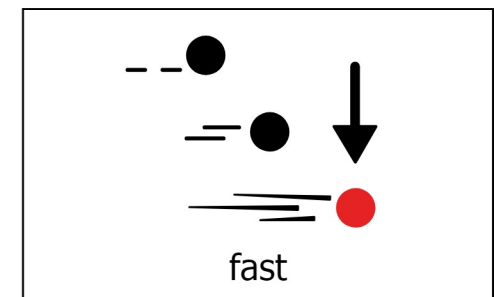
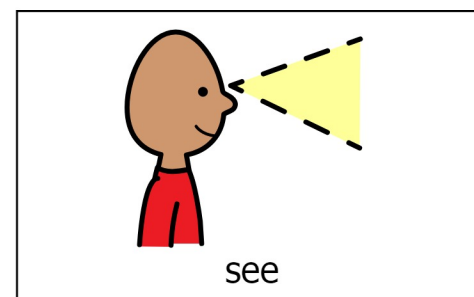
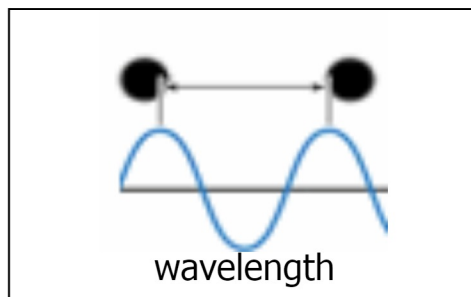
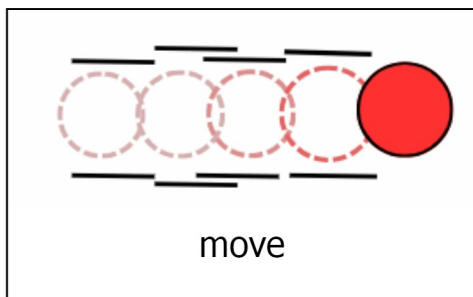
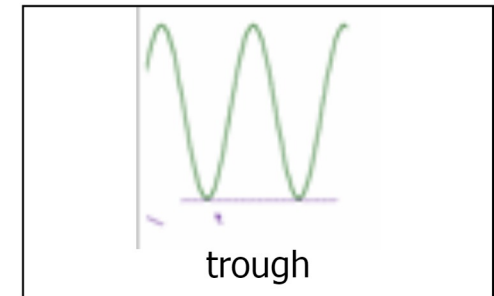
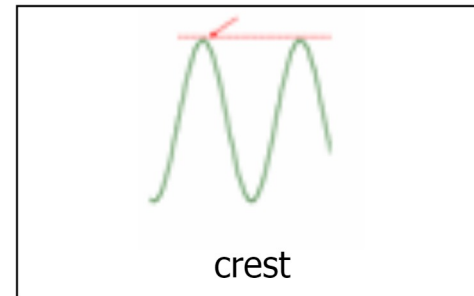
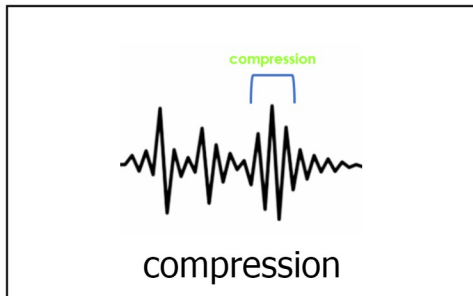
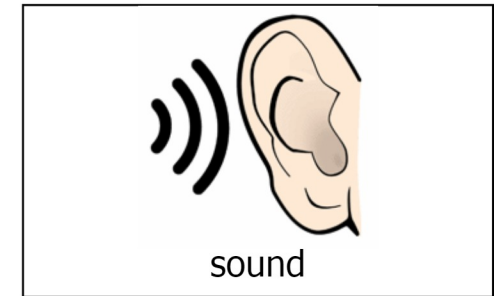
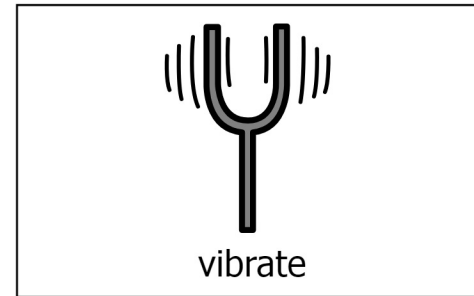
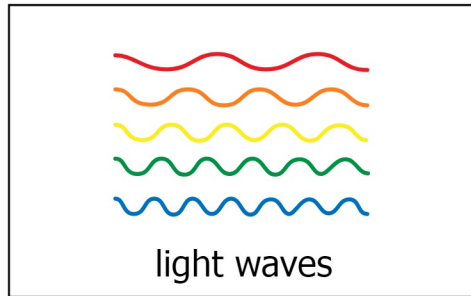
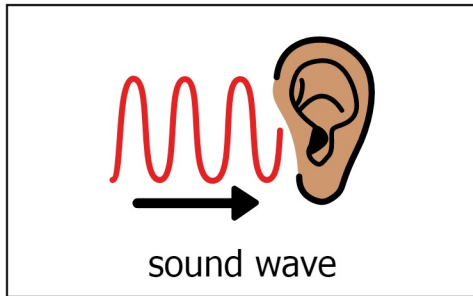


up

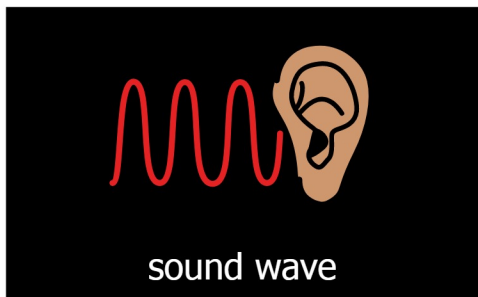


down

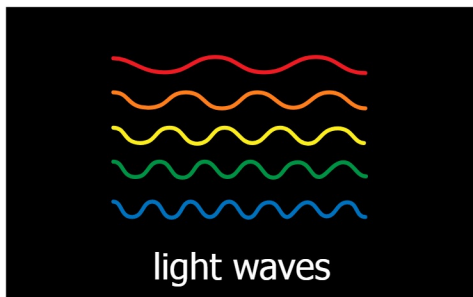
# Light & Sound Waves PCS Communication Boards 16 Loc



# Light & Sound Waves PCS Communication Boards 16 Loc



sound wave



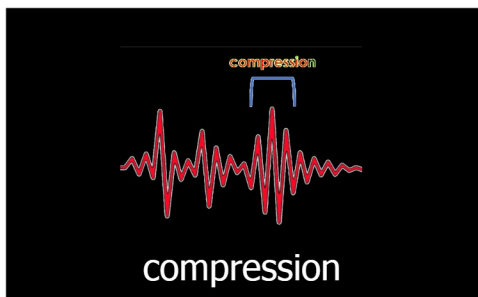
light waves



vibrate



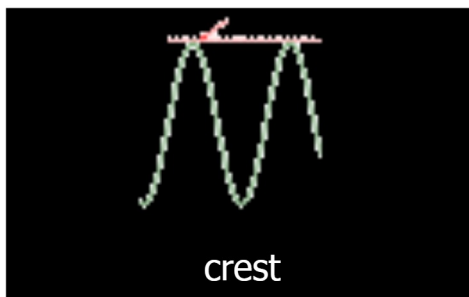
sound



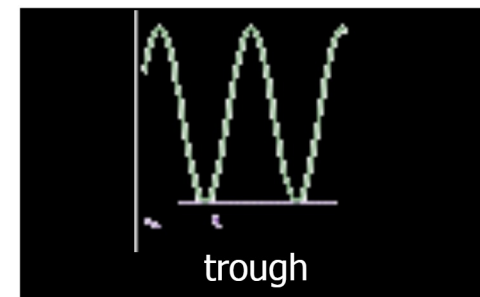
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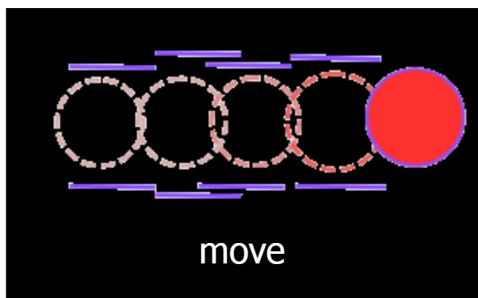
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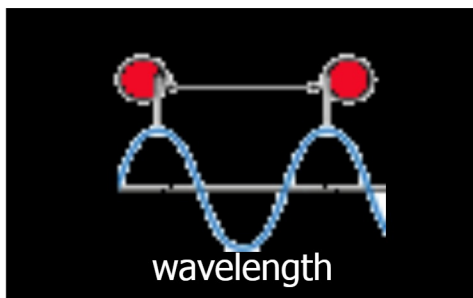
crest



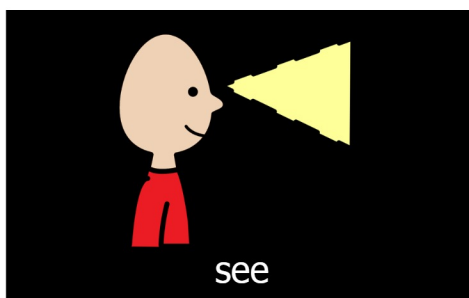
trough



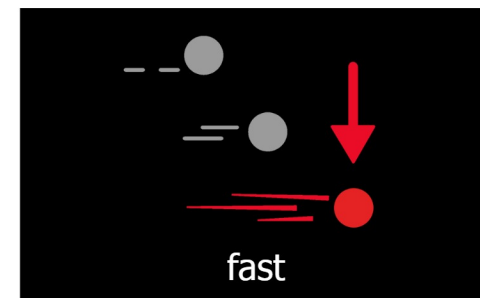
move



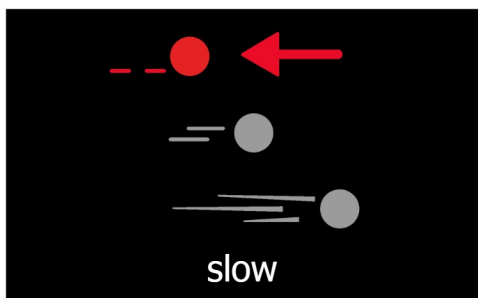
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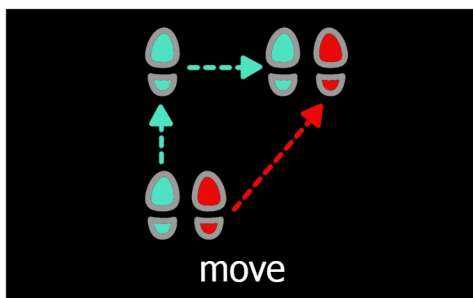
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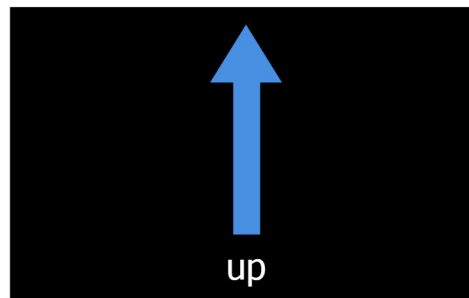
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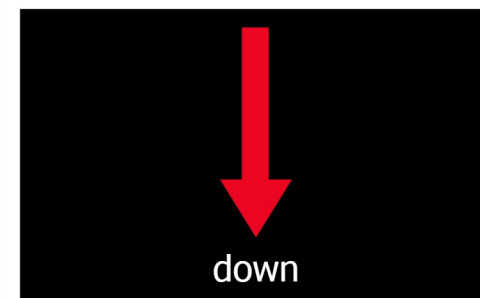
slow



move

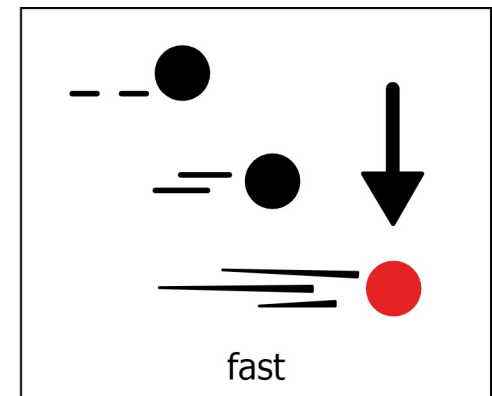
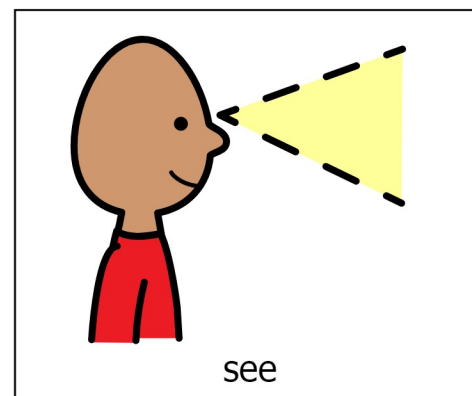
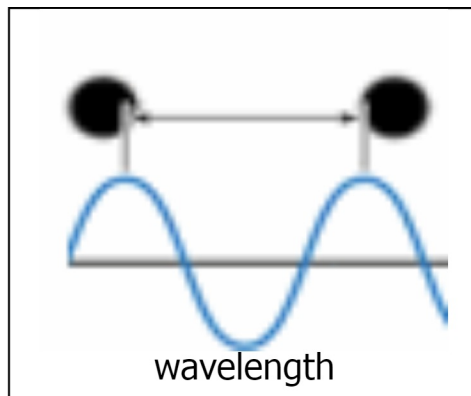
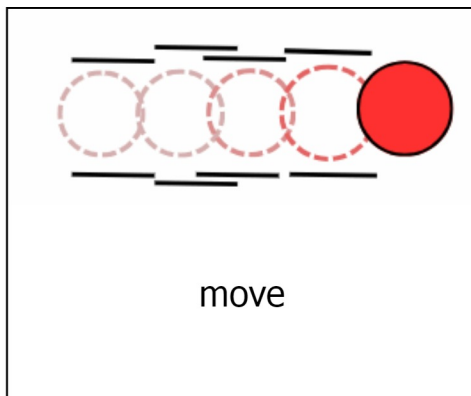
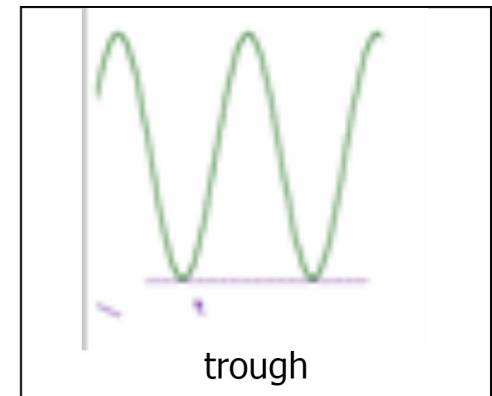
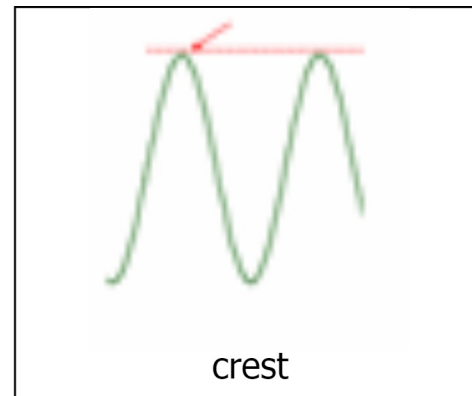
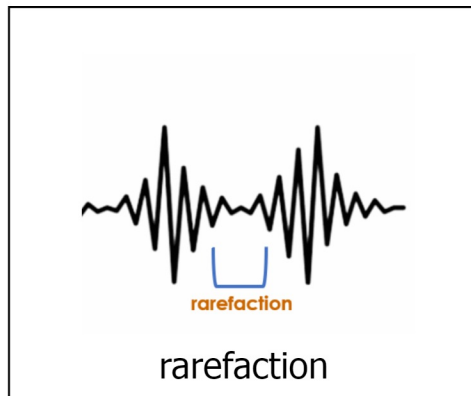
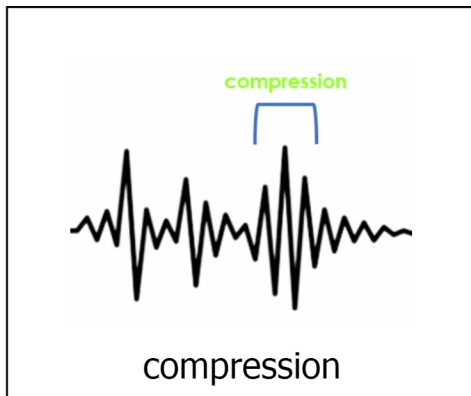
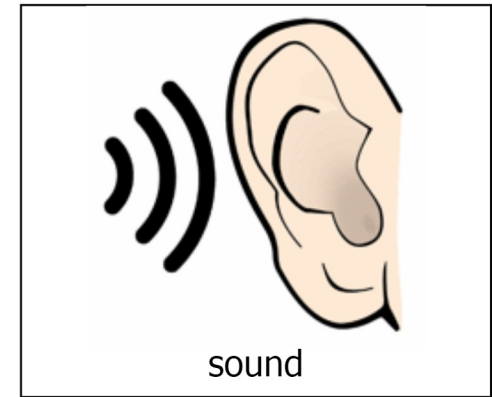
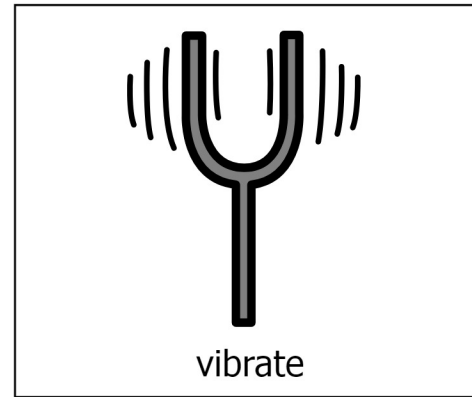
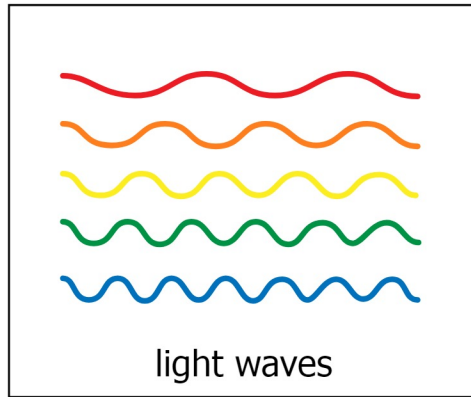
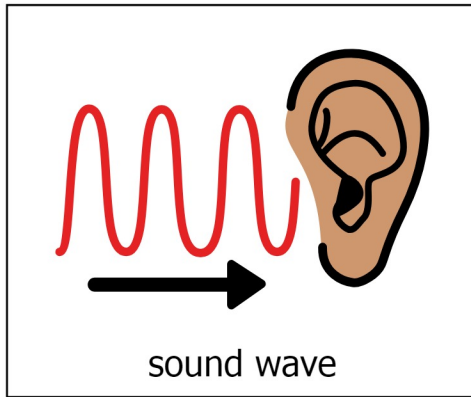


up

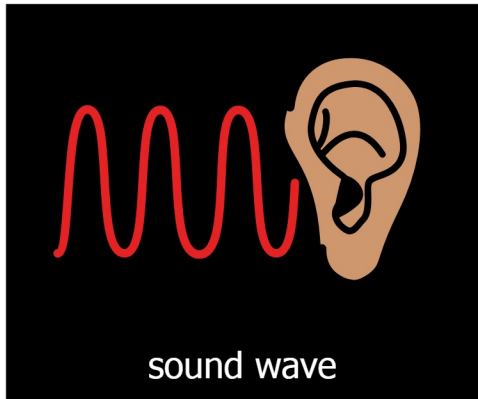


down

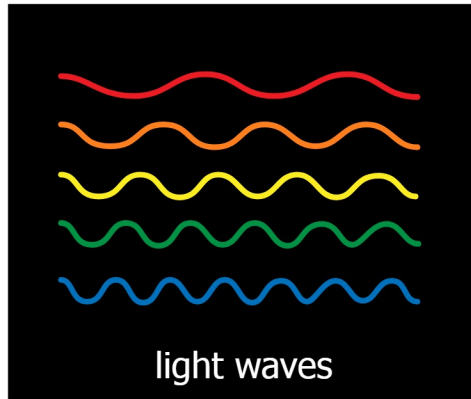
# Light & Sound Waves PCS Communication Boards 12 Loc



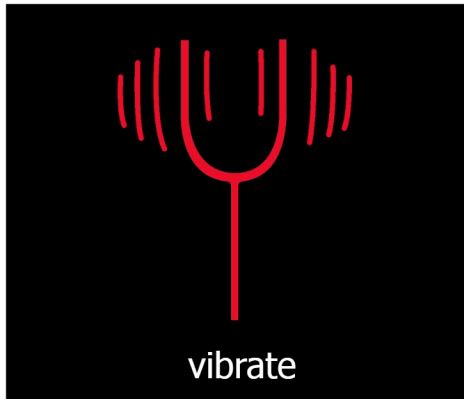
# Light & Sound Waves PCS Communication Boards 12 Loc



sound wave



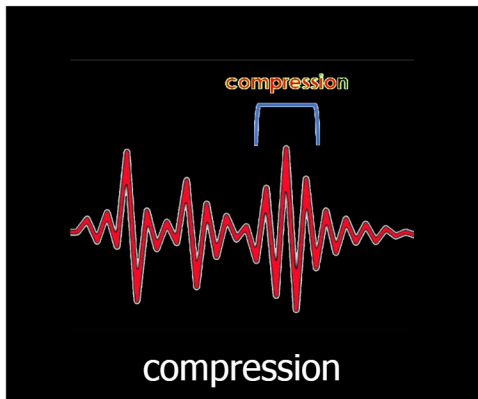
light waves



vibrate



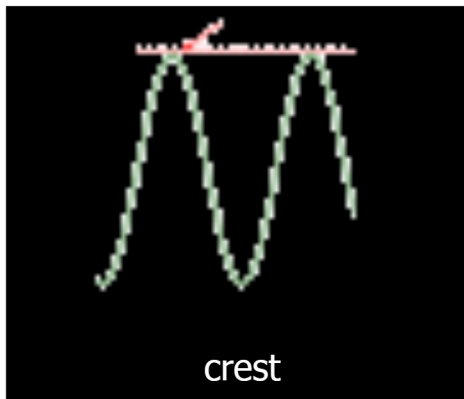
sound



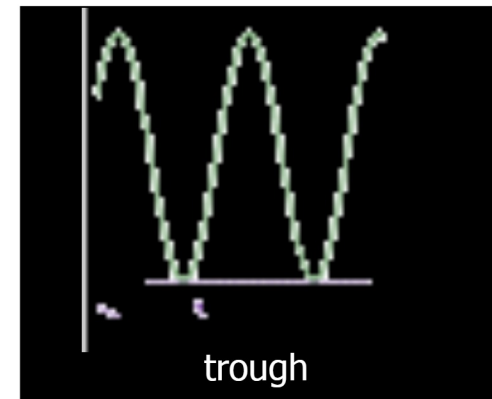
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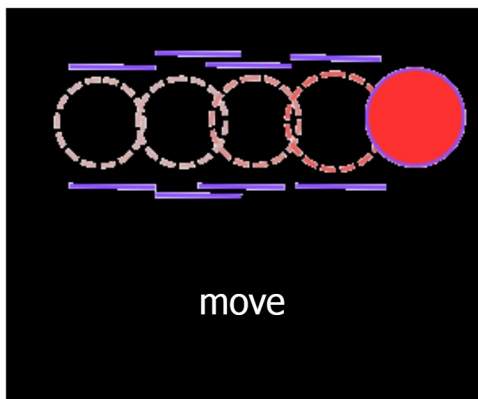
rarefaction



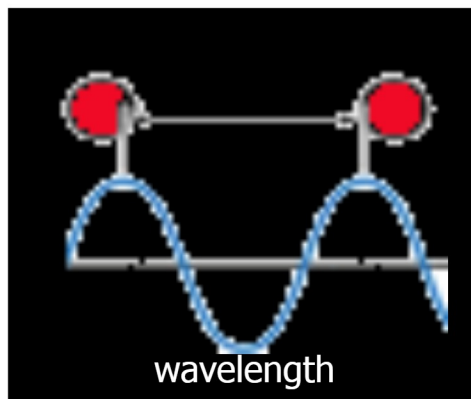
crest



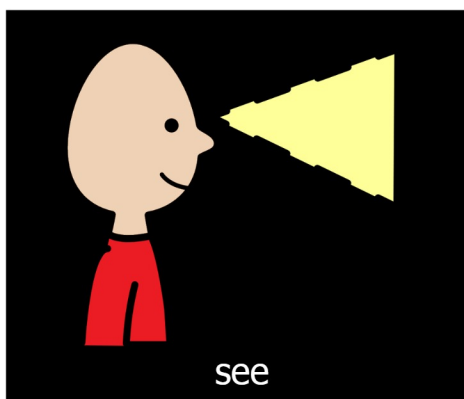
trough



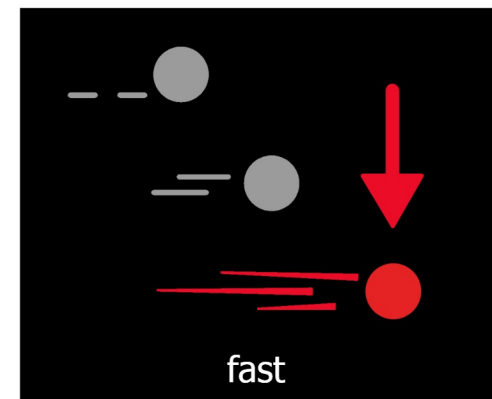
move



wavelength

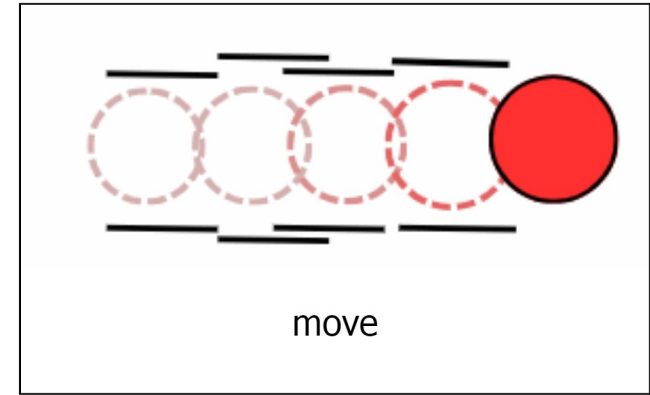
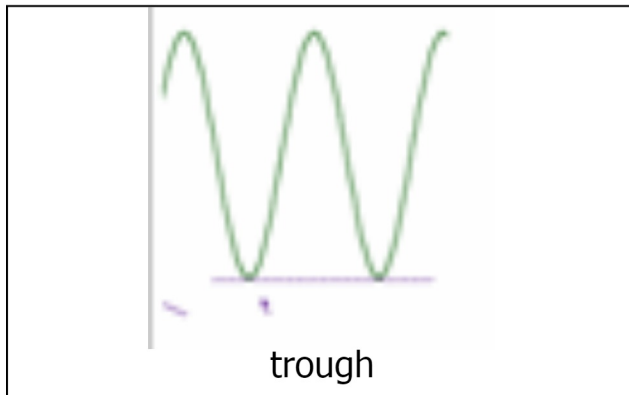
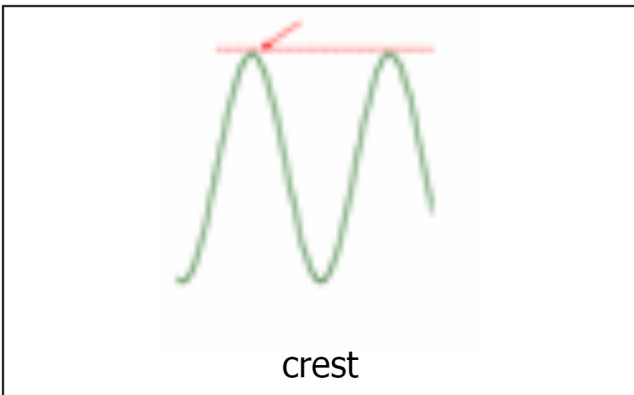
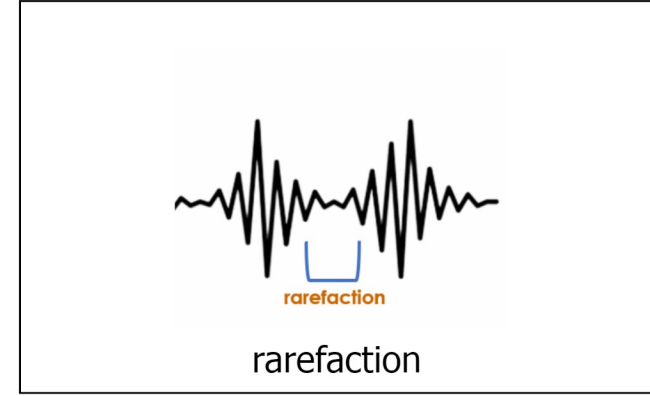
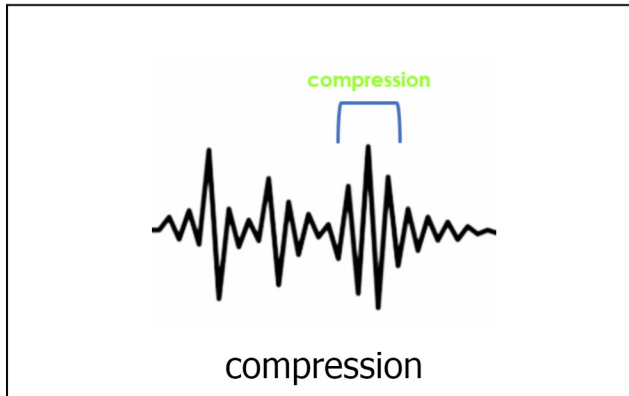
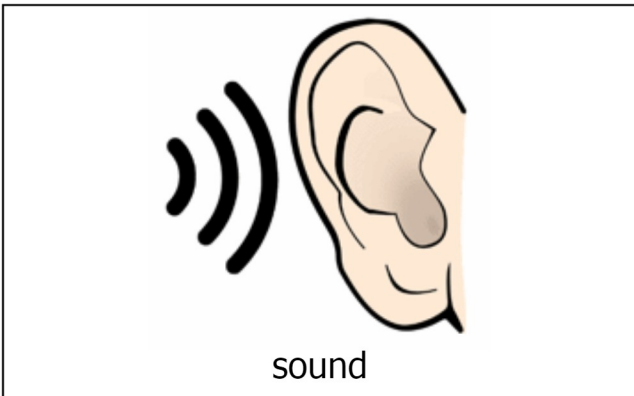
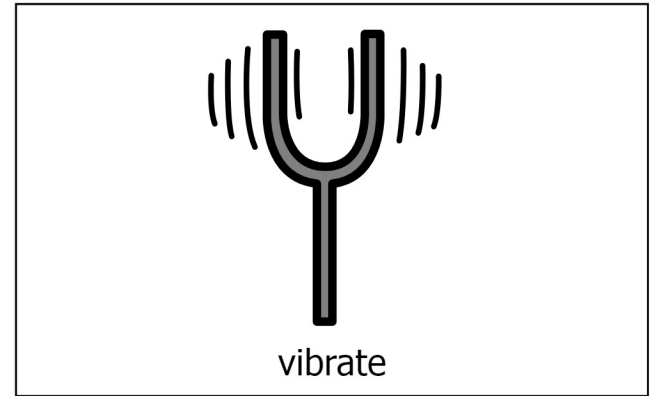
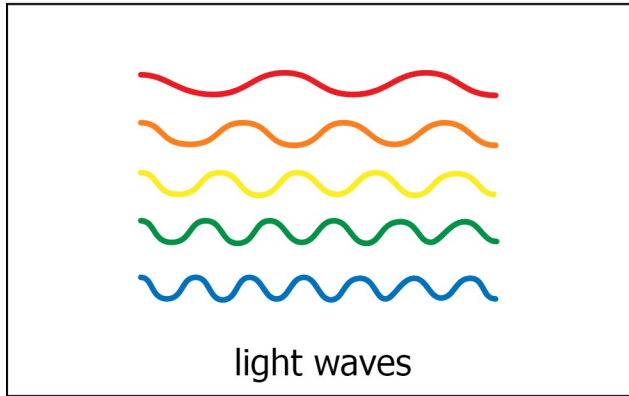
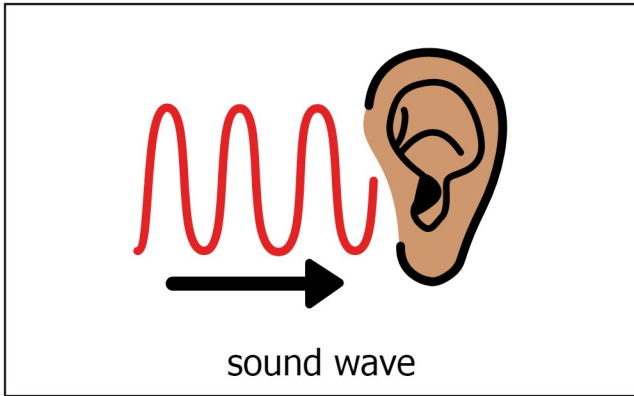


see

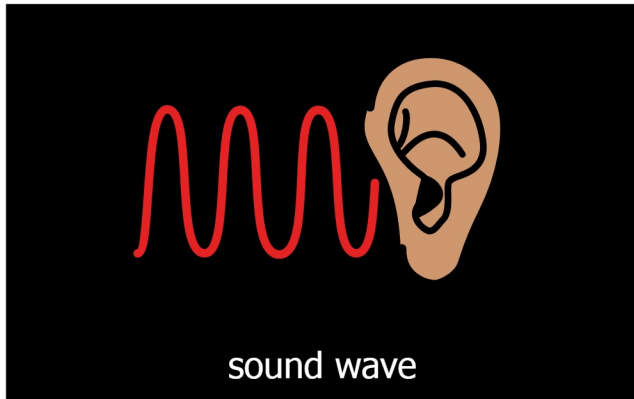


fast

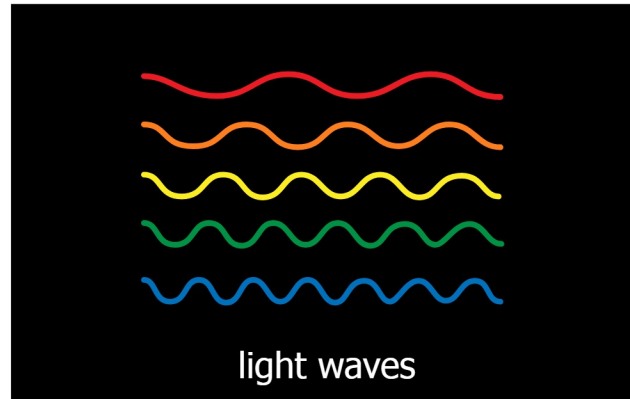
# Light & Sound Waves PCS Communication Boards 9 Loc



# Light & Sound Waves PCS Communication Boards 9 Loc



sound wave



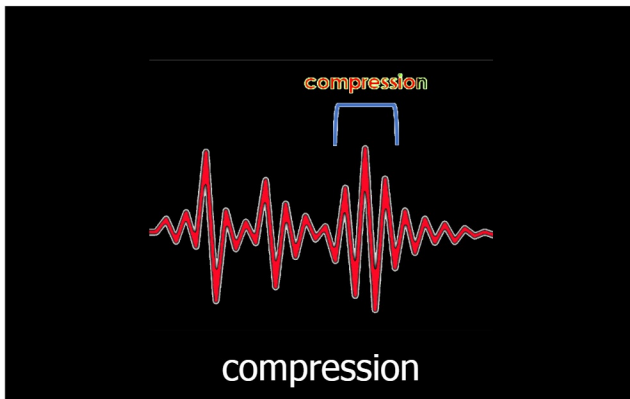
light waves



vibrate



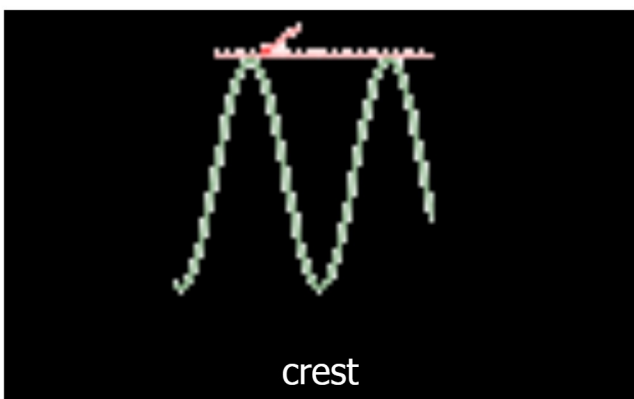
sound



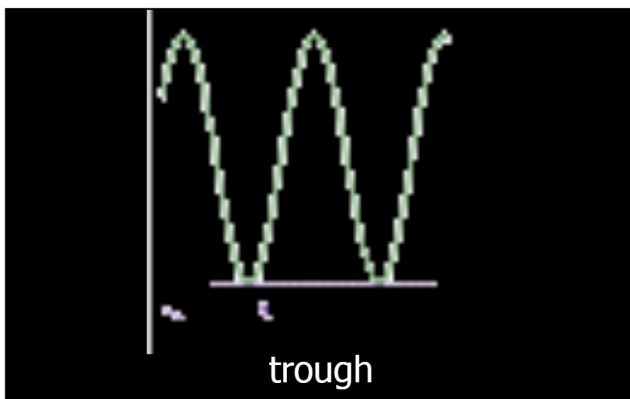
compression



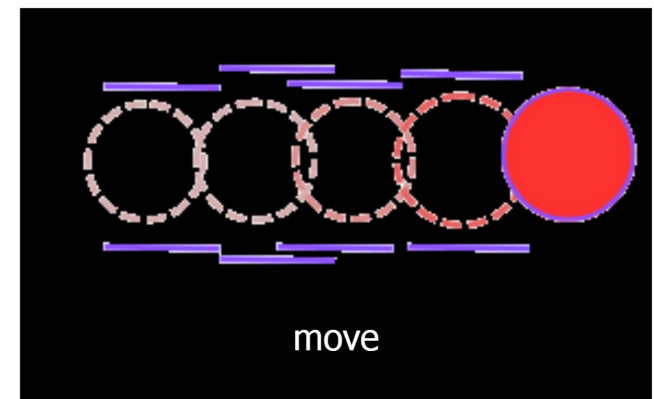
rarefaction



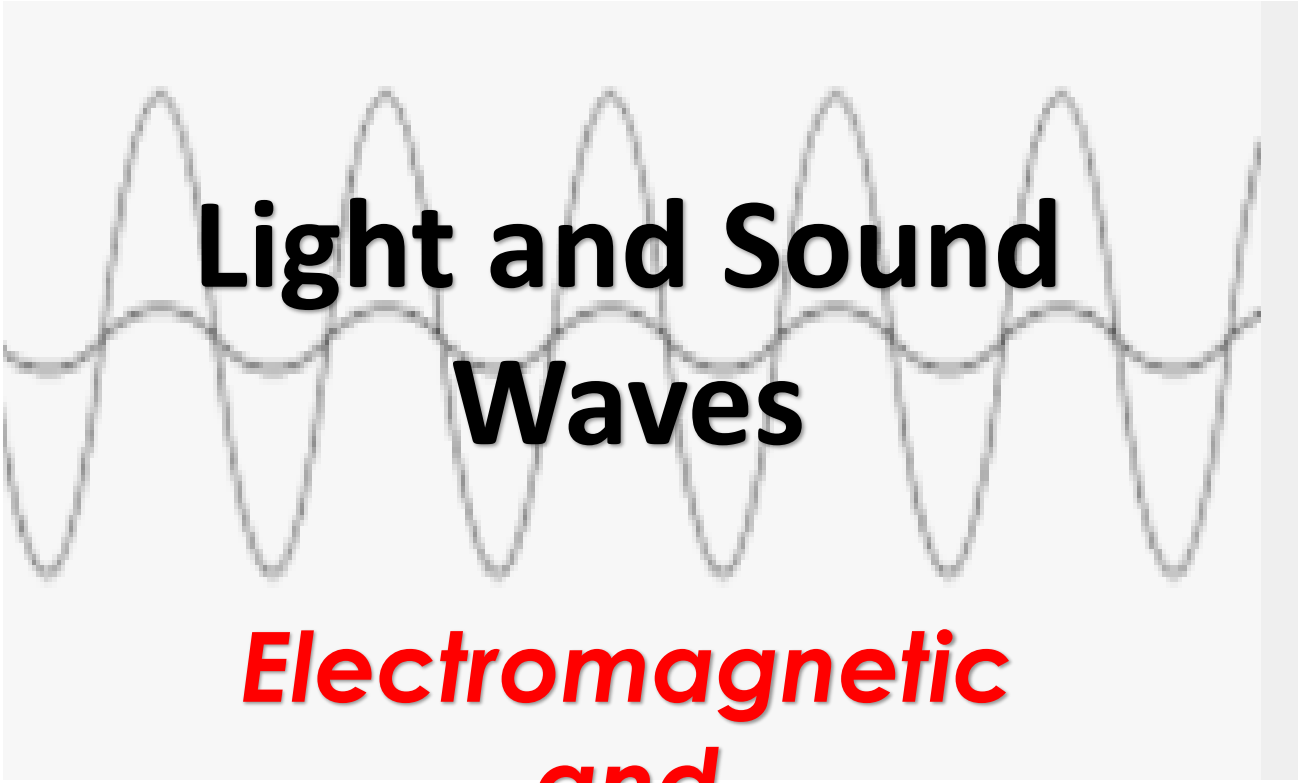
crest



trough



move



# Light and Sound Waves

**Electromagnetic  
and  
Mechanical Waves**

# Word Wall Words



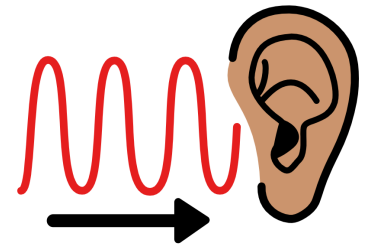
*AYC&M Academic Series: Juanita Pritchard/DTA Schools*



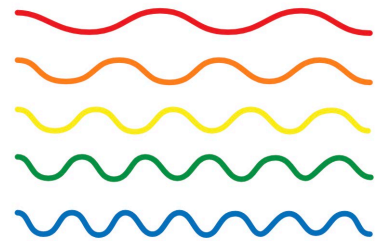
# LINE OF BEST FIT

## Word Wall - WORDS

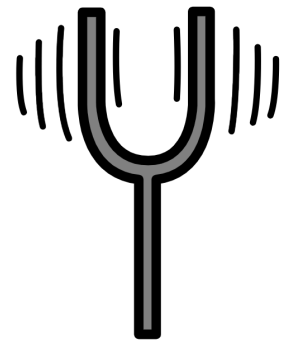
**sound waves**



**light waves**



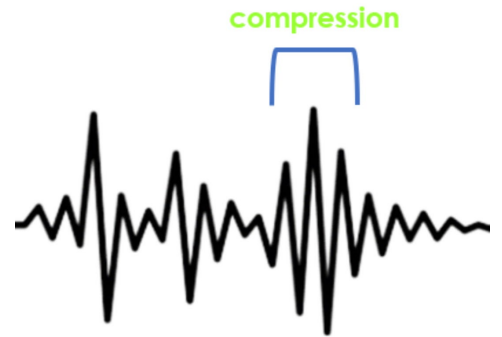
**vibrate**



sound



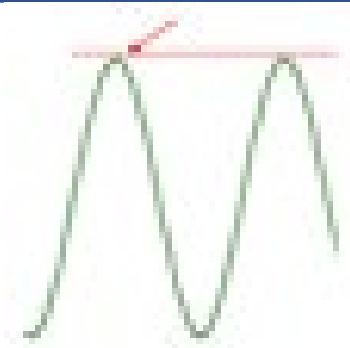
compression



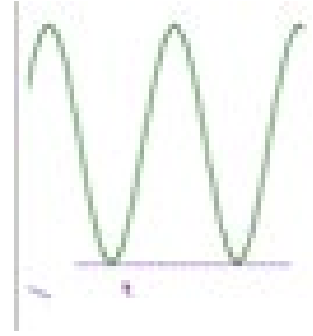
rarefaction



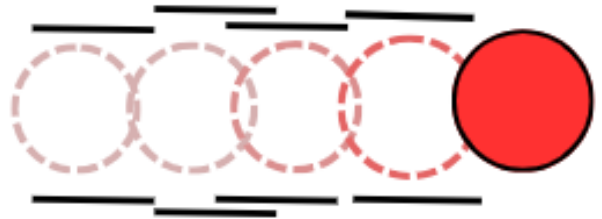
crest



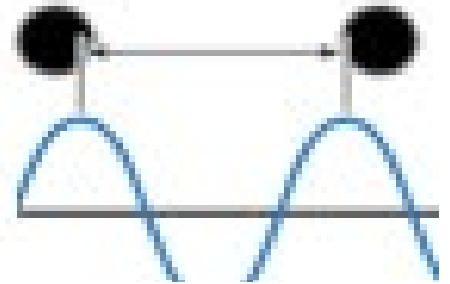
trough



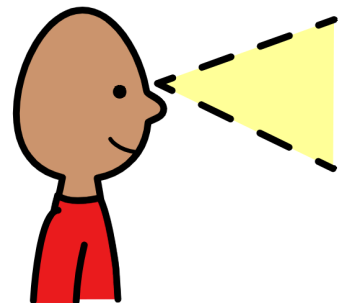
move



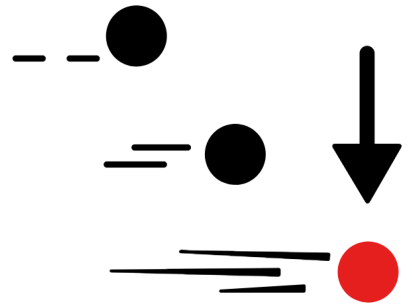
wavelength



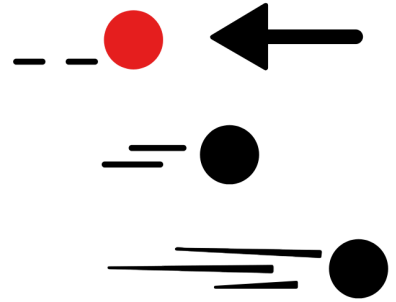
see



fast



slow



up



down





# LIGHT & SOUND WAVES

## BINGO Instructions

- **PREPARE:** Print, cut and laminate
  - Different BINGO cards, one for each student
  - Large Bingo Calling Cards (place in a container to be drawn during play)
  - Yellow Marker Squares (or provide other BINGO markers or dry erase markers)
  - Master Call Sheet



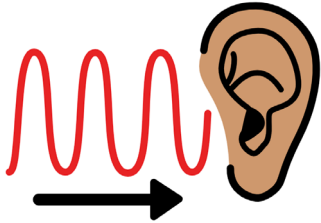
- **DISTRIBUTE:** One Bingo card to each child (each card should be different).
- **CALL:** The caller pulls out one random Large Bingo Calling Card from container, name it and/or show to other students. Mark the called card symbol on your Master Call Sheet.
- **MARK IMAGE:** The students will then look for the word called and, if found, place a BINGO marker on their BINGO Card
- **WINNING:** 3 across, up/down, diagonal; or 4 corners wins. When a student thinks they have a winning pattern they call out "BINGO!" The first student to call out "BINGO!" wins!

# B I N G O!

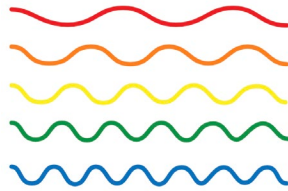
# LIGHT & SOUND WAVES



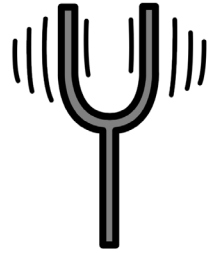
## BINGO



sound waves



light waves



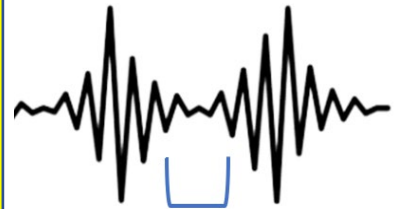
vibrate



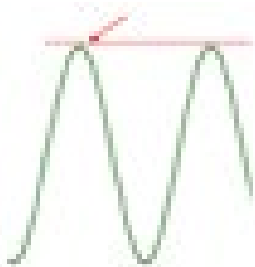
sound



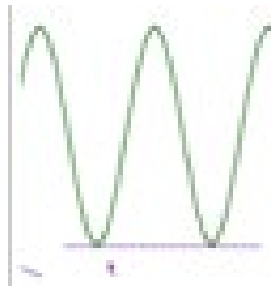
compression



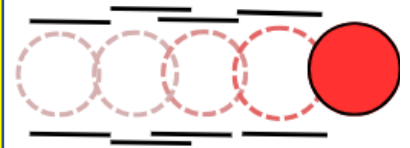
rarefaction



crest



trough

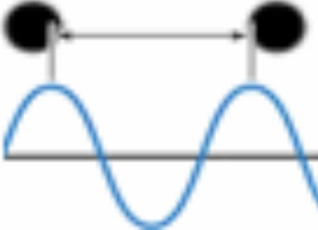


move

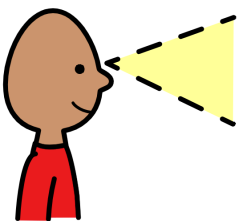
# LIGHT & SOUND WAVES



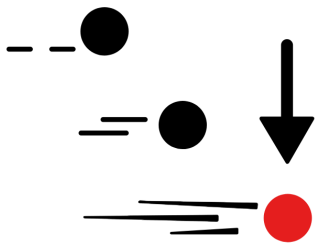
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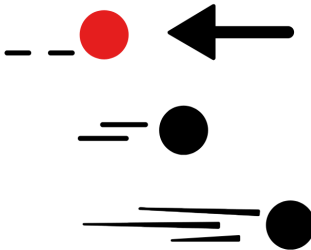
wavelength




see




fast



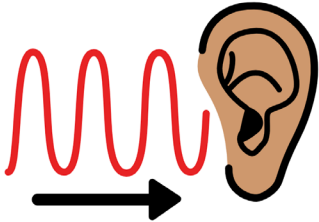
slow



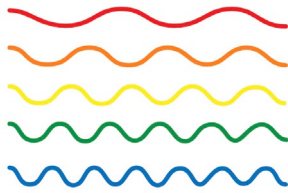
up



down



sound waves



light waves

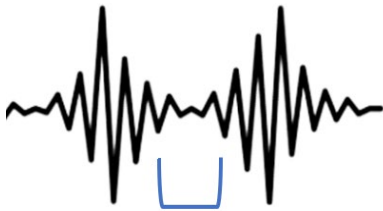


vibrate

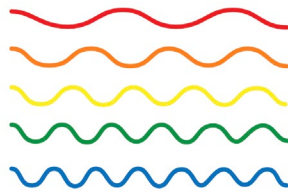
# LIGHT & SOUND WAVES



# BINGO



rarefaction



light waves



vibrate



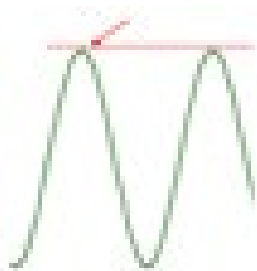
sound



compression



up



crest



down



move

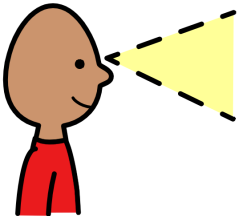
# LIGHT & SOUND WAVES



## BINGO



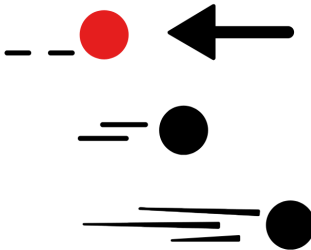
compression



see



fast




slow



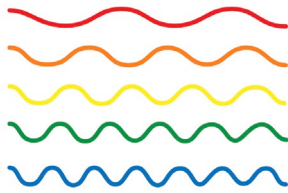
vibrate



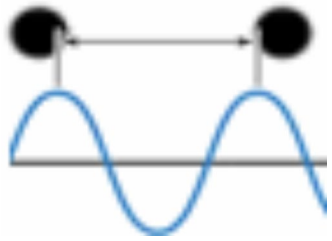
sound waves



down



light waves

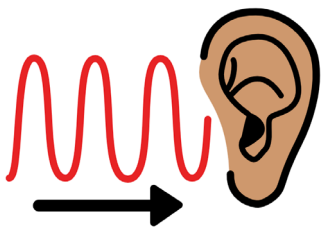


wavelength

# LIGHT & SOUND WAVES



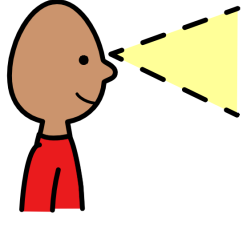
## BINGO



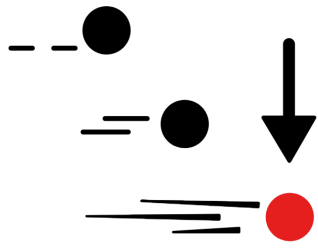
sound waves



rarefaction



see



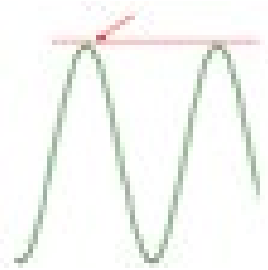
fast



compression




sound



crest



slow

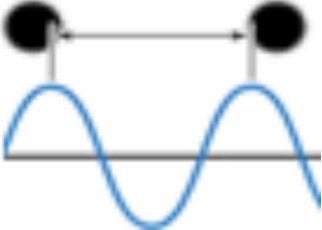


move


# LIGHT & SOUND WAVES



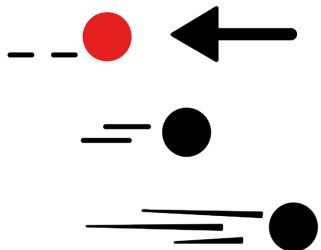
# BINGO



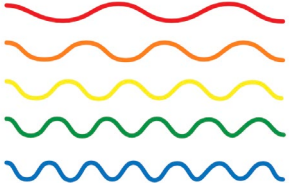
wavelength



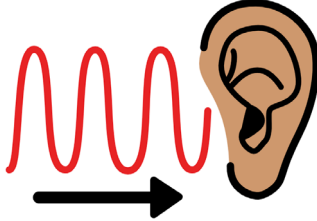
down



slow



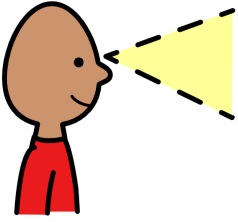
light waves



sound waves



fast



see



rarefaction



vibrate

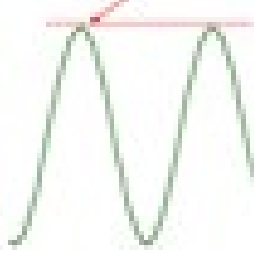
# LIGHT & SOUND WAVES



## BINGO



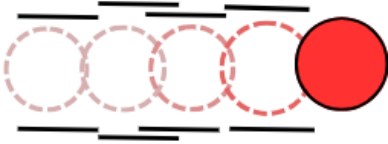
**sound**



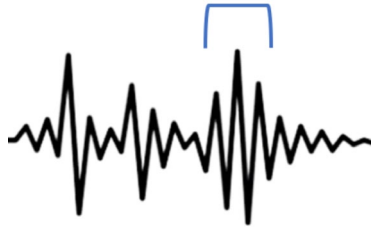
**crest**



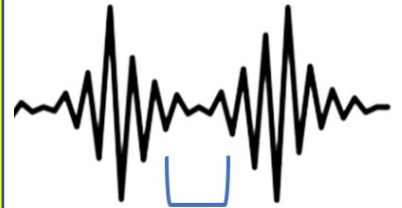
**vibrate**



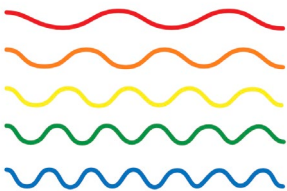
**move**



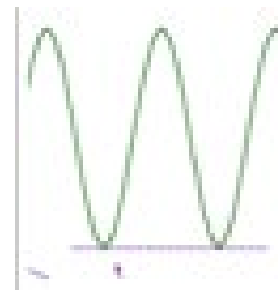
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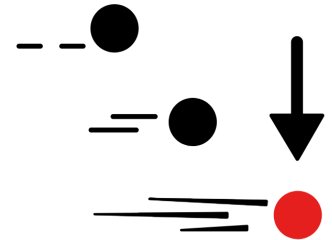
**rarefaction**



**light waves**



**trough**



**fast**

# LIGHT & SOUND WAVES



# BINGO

fast

sound waves

compression

slow

light waves

down

move

wavelength

vibrate

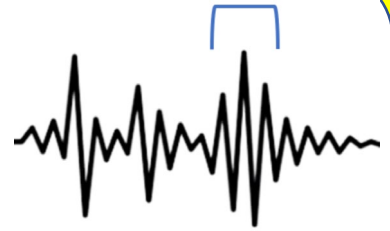
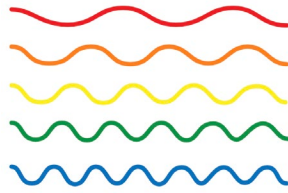
# LIGHT & SOUND WAVES



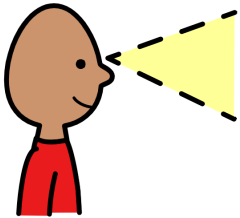
## BINGO



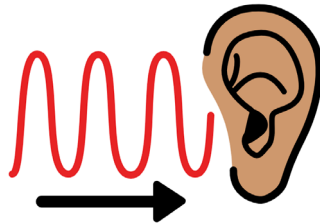
light waves



compression



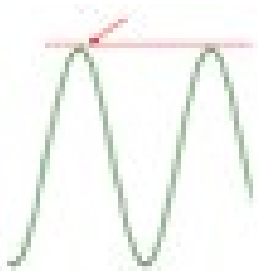
see



sound waves



rarefaction



crest



up

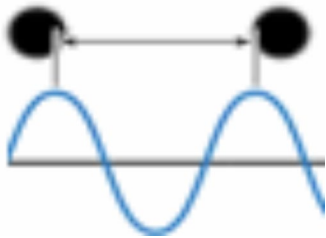


move

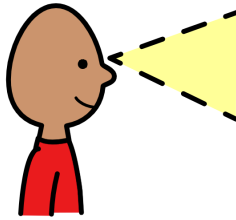
# LIGHT & SOUND WAVES



## BINGO



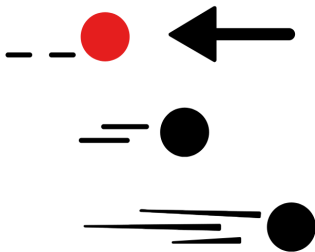
wavelength



see



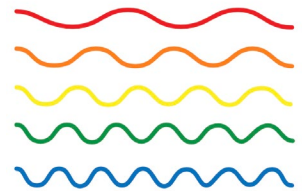
move



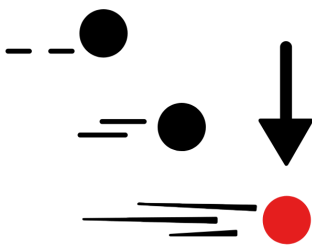
slow



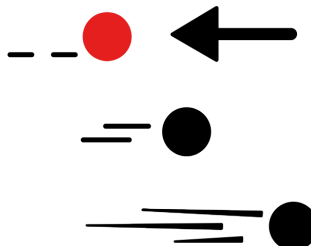
sound



light waves



fast



slow



vibrate


# LIGHT & SOUND WAVES



## BINGO



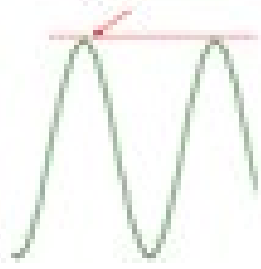
sound waves



down




vibrate



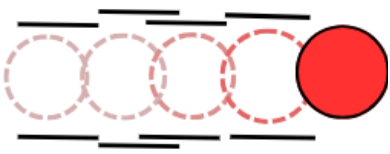
crest



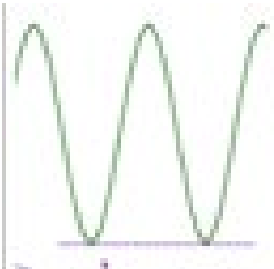
compression



up



move



trough

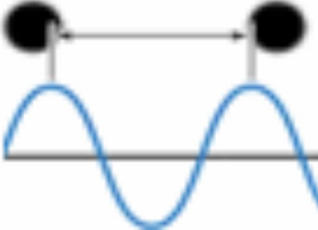


rarefaction

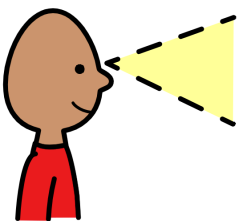
# LIGHT & SOUND WAVES



## BINGO



wavelength



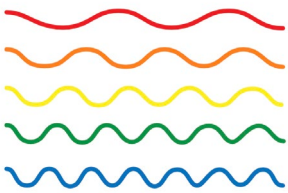
see



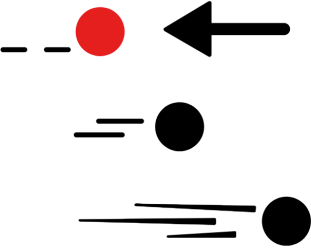
fast




sound




light waves



slow



up



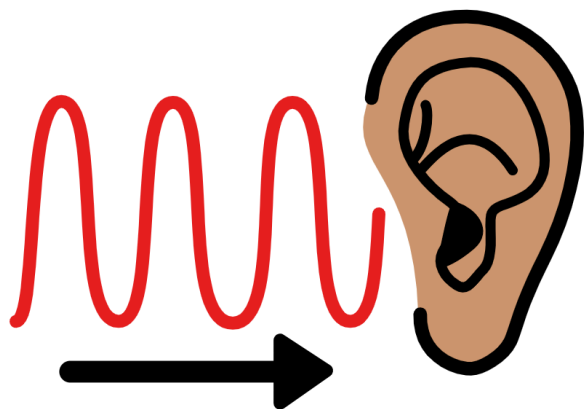
down



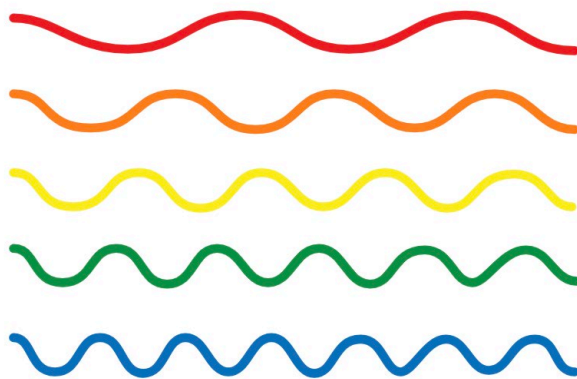
vibrate

# LIGHT & SOUND WAVES

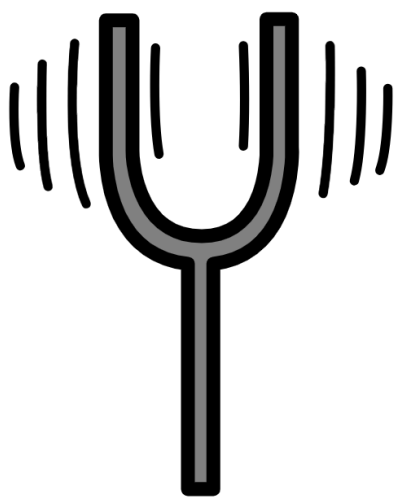
## BINGO CALL CARDS



**sound waves**



**light waves**



**vibrate**



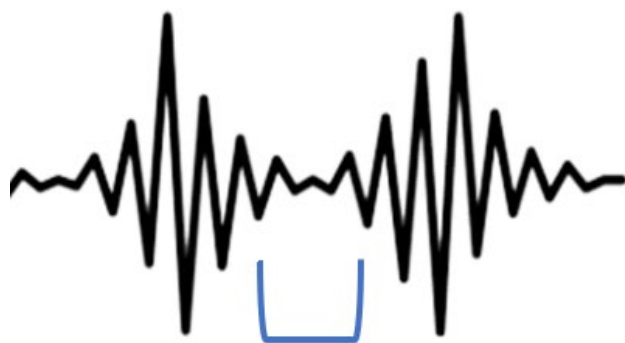
**sound**

# LIGHT & SOUND WAVES

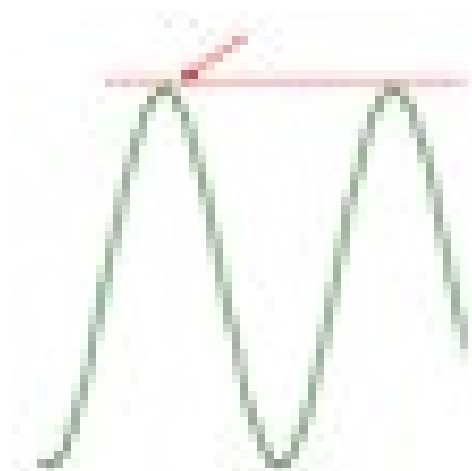
## BINGO CALL CARDS



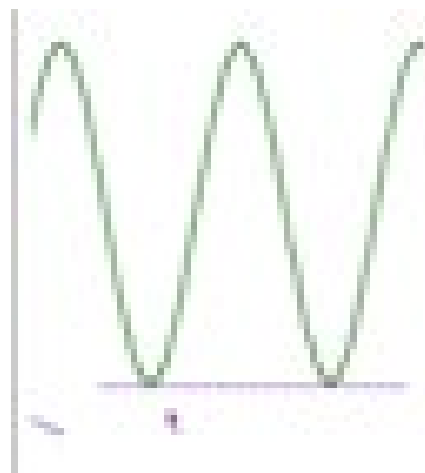
**compression**



**rarefaction**



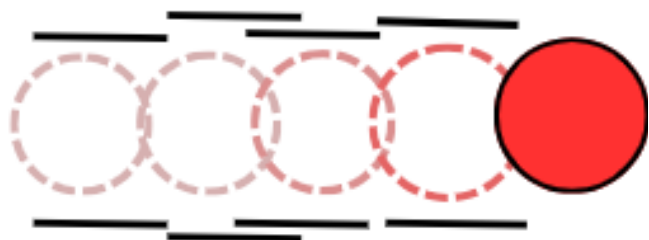
**crest**



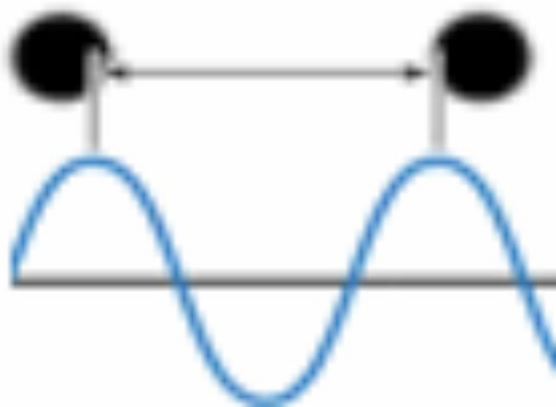
**trough**

# LIGHT & SOUND WAVES

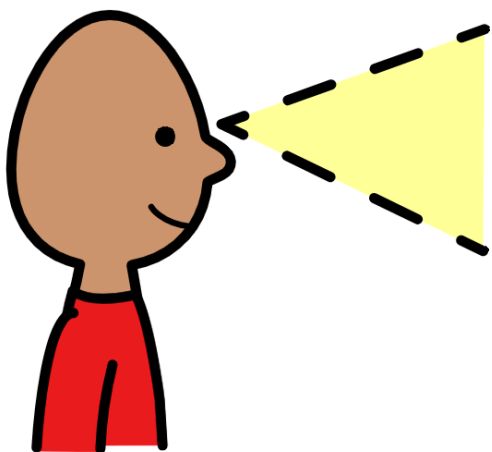
## BINGO CALL CARDS



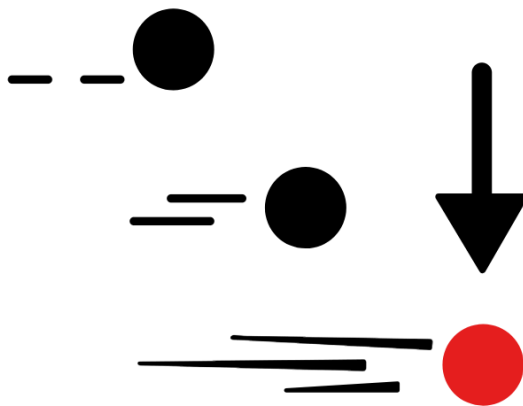
**move**



**wavelength**

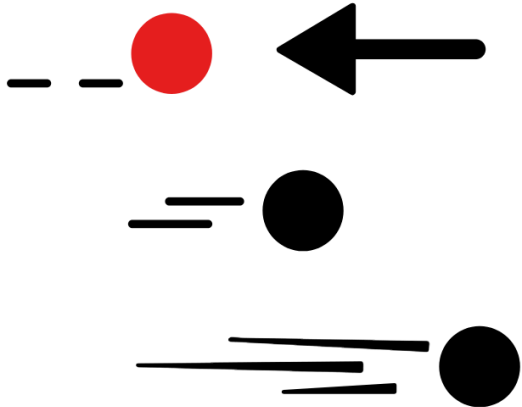


**see**



**fast**

# LIGHT & SOUND WAVES BINGO CALL CARDS



slow



up

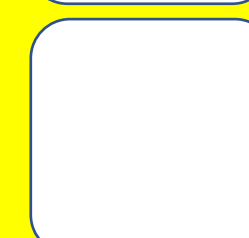
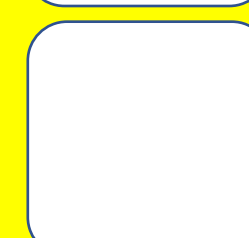
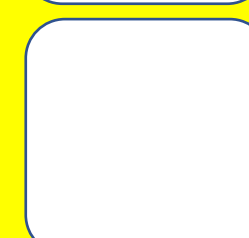
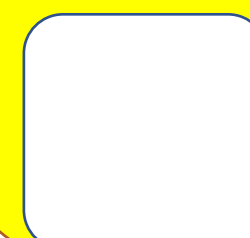
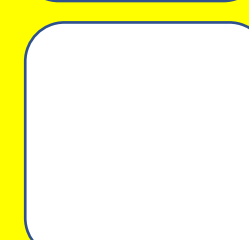
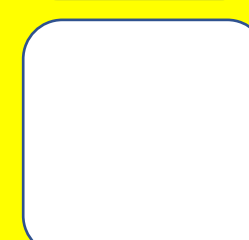
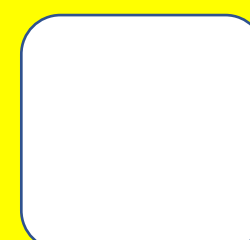
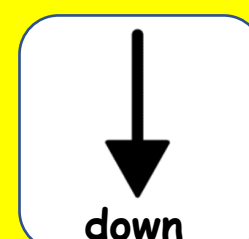
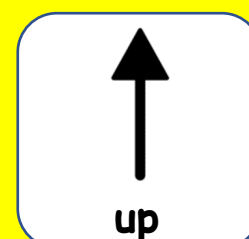
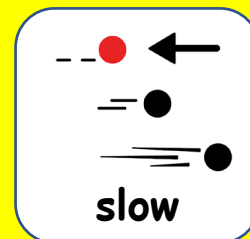
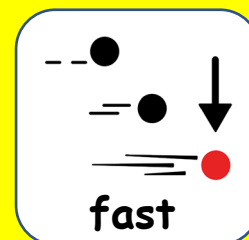
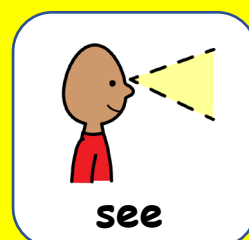
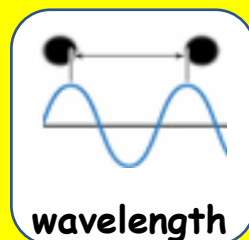
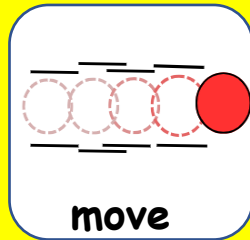
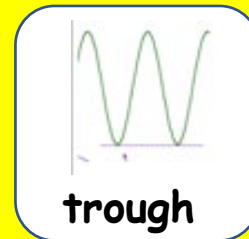
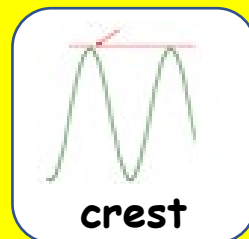
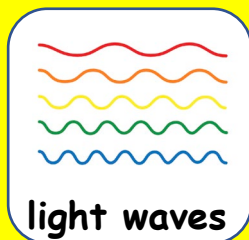


down

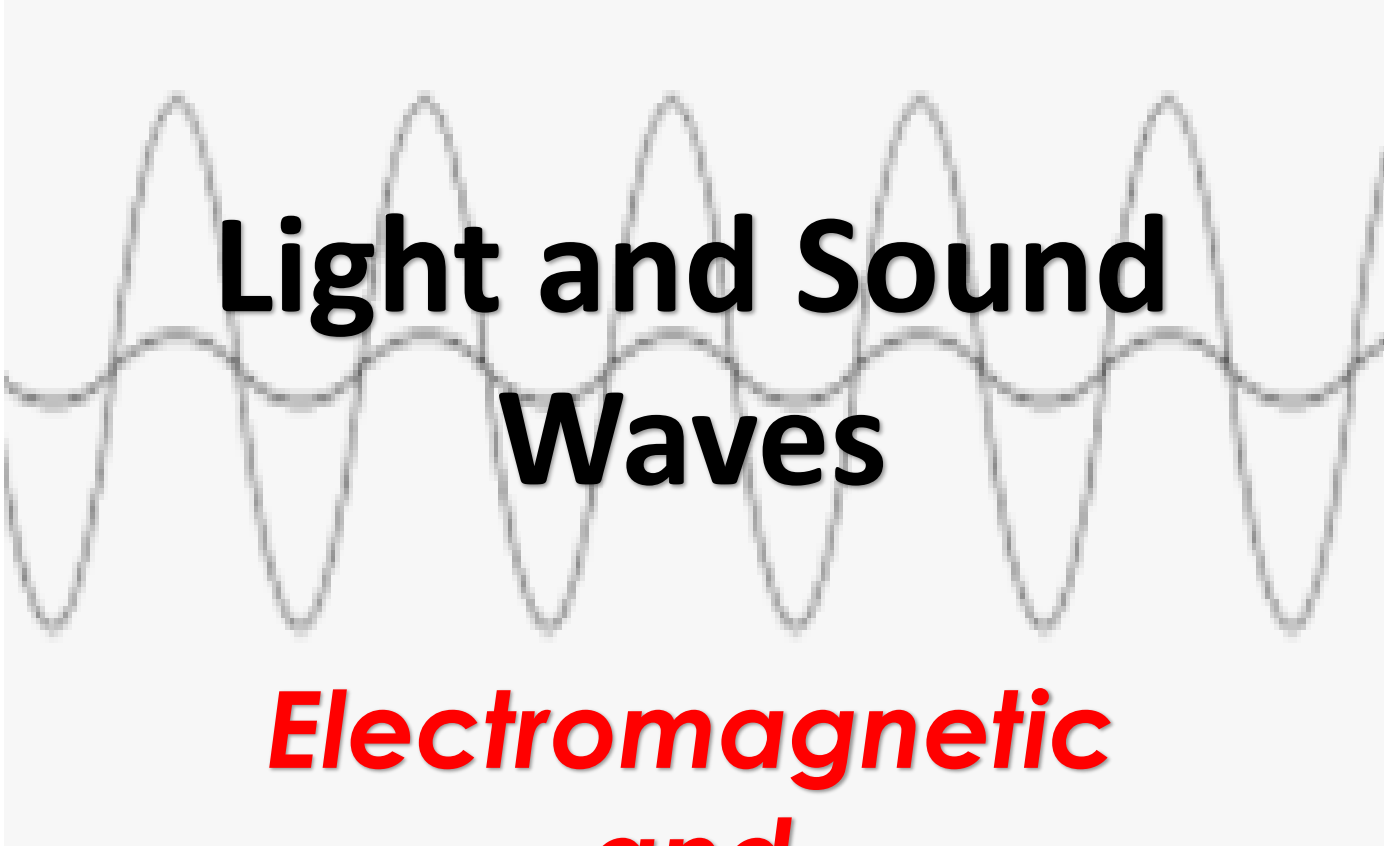
# LIGHT & SOUND WAVES



## BINGO Call Sheet







# Light and Sound Waves

## *Electromagnetic and Mechanical Waves*

# I Have... Who Has...



*AYC&M Academic Series: Juanita Pritchard/DTA Schools*



# LIGHT & SOUND WAVES

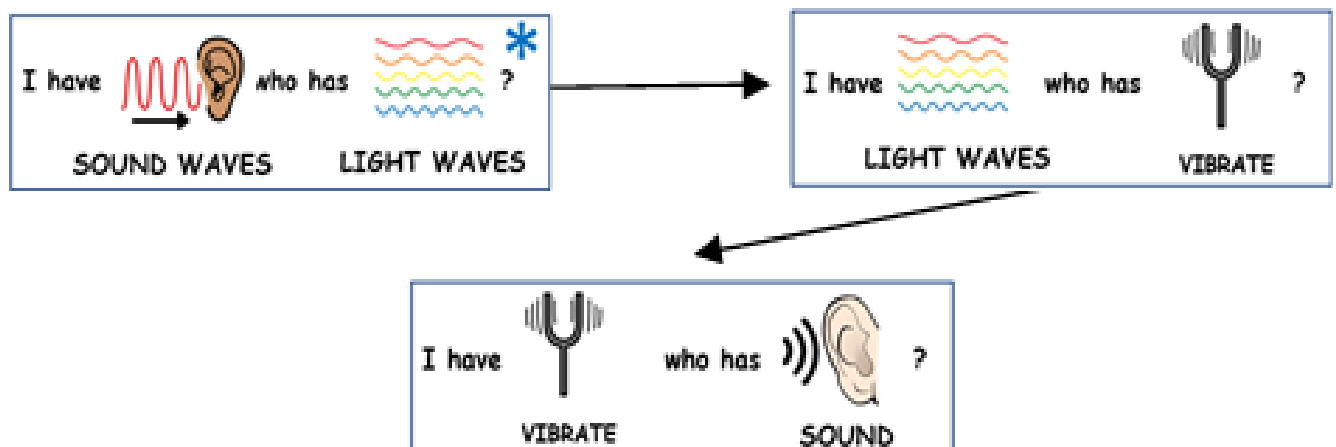
## "I Have... Who Has..." Directions

This is a simple game that encourages cooperation and joint attention between peers. Students will be generalizing their new regions of Georgia vocabulary knowledge as they interact with their peers. As students listen to match up the answers on their cards with questions on other students' cards, they get practice with paying attention and listening to others.

**Cut the cards into strips and pass out one to each student.**

*If you have less than 11 students, you can give more than one card to each student OR be sure to match up the cards you are using prior to the game to ensure there are the same number of example items to match the different ecosystems.*

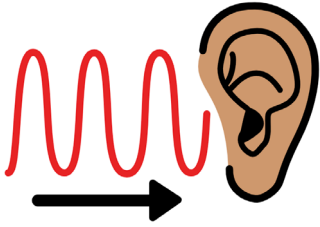
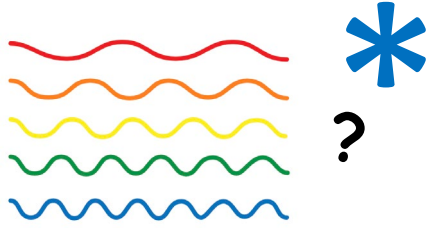
1. Choose a student to go first and have them read their card with the \* aloud.
2. Any student who has a card with the answer then reads that answer aloud: "**I have ... Who has...?**". In this game, there will be multiple students who may have a card which answers the question. The first to respond goes next.
3. The next student will then read the question on their card - '**I have...Who has ...?**' Every card in the set is connected to a card before it and a card after it. The last card should link to the student who started the game.
4. Play continues in this fashion until all the cards have been played. The game will end with the same student who started play.



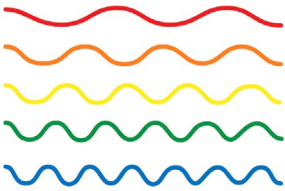
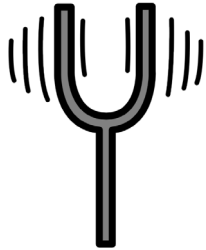


# Light & Sound Waves

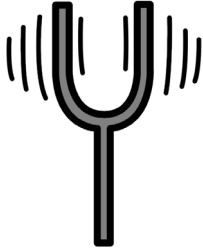

**I HAVE..... WHO HAS.....**

I have  who has  ?


**SOUND WAVES**                      **LIGHT WAVES**

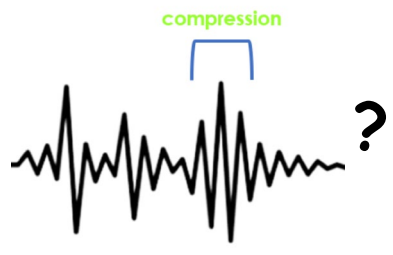
I have  who has  ?

**LIGHT WAVES**                      **VIBRATE**

I have  who has  ?

**VIBRATE**                      **SOUND**

I have  **SOUND**

who has  ?

**COMPRESSION**

I have  **COMPRESSION**

who has  ?

**RAREFACTION**

I have  **RAREFACTION**

who has  ?

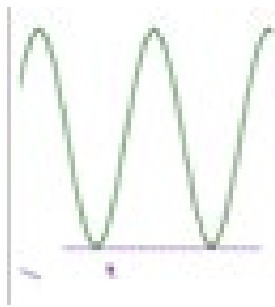
**CREST**

I have  **CREST**

who has  ?

**TROUGH**

I have



TROUGH

who has



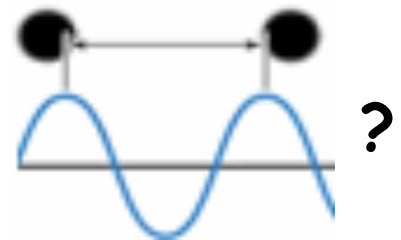
MOVE

I have



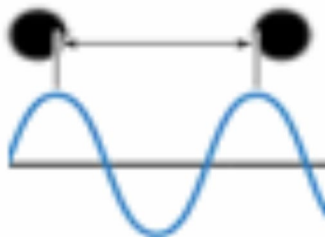
MOVE

who has



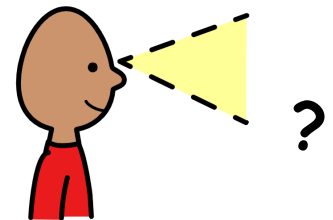
WAVELENGTH

I have



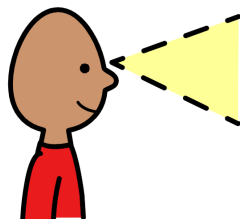
WAVELENGTH

who has



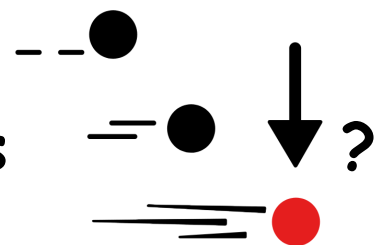
SEE

I have

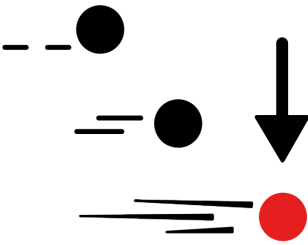


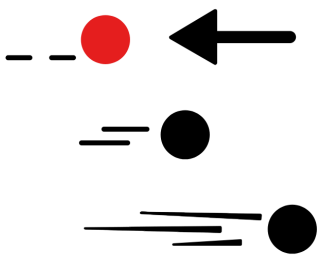
SEE

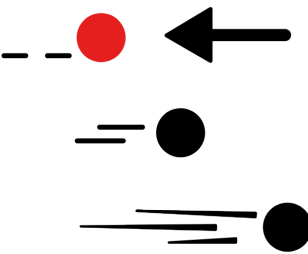
who has





FAST


I have  **FAST**


who has  **SLOW**

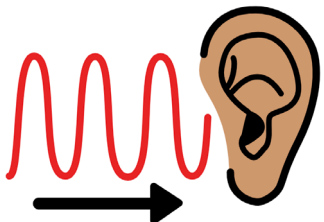
I have  **SLOW**

who has  **UP** ?

I have  **UP**

who has  **DOWN** ?

I have  **DOWN**

who has  **SOUND WAVE** ?