



ANSWER KEYS [K-3]

ACTIVITY 1: COLOR ME!

Objects that produce light:

- Lightbulb
- Lamp
- Candle

ACTIVITY 2: TIME TO MATCH!

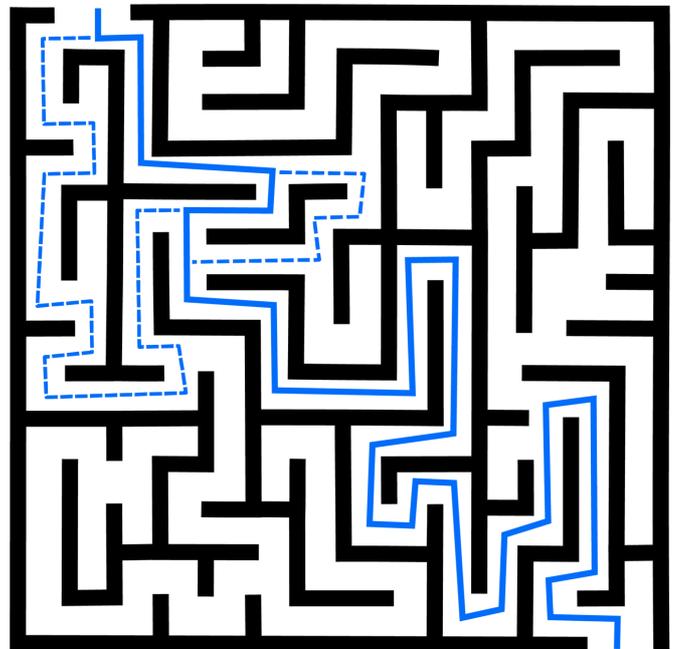


ACTIVITY 3: CIRCLING AROUND!

Things that produce sound:

- Bird
- Trumpet
- Radio
- Bell
- Drum

ACTIVITY 4: SPEED UP!





ANSWER KEYS [4-6]

ACTIVITY 1: WORDSEARCH

I G L T A A E R I N L E S K M
 T R H T R U L O N E W T O N A
 H A U A C T O B R C I Y L U G
 C V R E S I S T A N C E I G N
 C I C Y O Q K L T I V R R W
 M T A M O M E N T U M Z E G T
 Y Y O N L N T A E C R O T P U
 O Q S A C E L U M Y T F L H D
 M H F R I C T I O N C Y E J L
 P A N G M F D E M M G K X R O
 C V S E T N R U N F T W D Y D
 C R Z S E M L J C S N L S N M
 F A C C E L E R A T I O N Q O
 F F C T S G U R E T E O S N H
 V H A B O S C M E S R W N X I

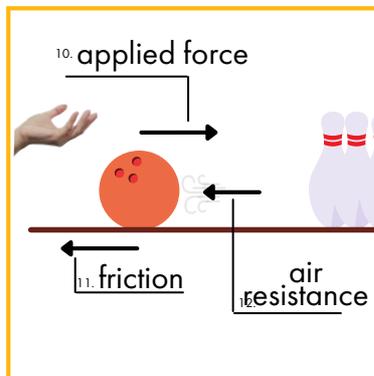
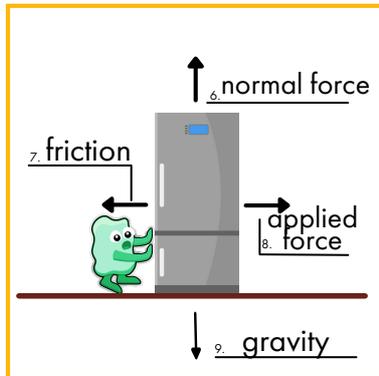
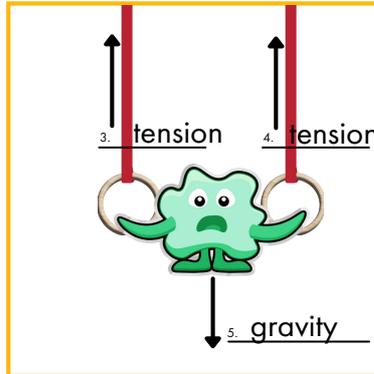
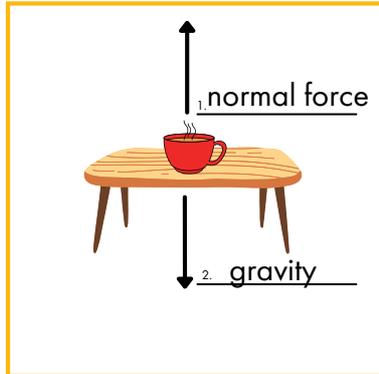
ACTIVITY 2: CROSSWORD

1 A M
 2 A T
 3 E
 4 W A V E L E N G T H
 5 F R E Q U E N C Y
 6 S U P E R P O S I T I O N
 7 I N T E N S I T Y
 8 M O M E N T U M
 9 K I N E T I C E N E R G Y
 10 A N G L E O F I N C I D E N C E
 11 E N T R O P Y
 12 T R A N S M I S S I O N
 13 R E F L E C T I O N
 14 H E A T
 15 P O T E N T I A L
 16 D I R E C T C U R R E N T
 17 S P E E D O F F L I G H T
 18 R A D I O W A V E S
 19 S I M U L T A N E O U S



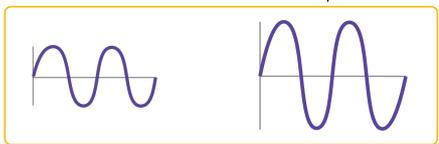
ANSWER KEYS [4-6]

ACTIVITY 3: GUESS THE FORCE



ACTIVITY 4: SONIC SHOWDOWN

Choose the bird that produces the louder sound.



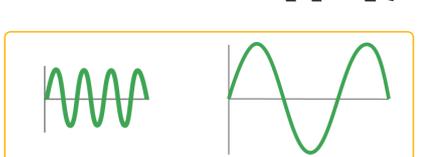
Choose the instrument that produces the sound with a higher pitch.



Choose the object that produces the softer sound.



Choose the animal that makes the sound with a lower pitch



Which among all the objects makes a soft but high-pitched sound?

Hamsters

Among those that produce a loud sound, which object/s has the lowest pitch? carabao/drum



ANSWER KEYS [7-10]

ACTIVITY 1: WATTS UP?

Rubrics for write-up

	4	3	2	1
FOCUS	Clear and distinct points made about the topic with evident awareness of the task.	Apparent points made about the topic with sufficient awareness of the task.	Vague and unclear points made about the topic with little awareness of the task.	No apparent points made about the topic.
CONTENT	Used specific and important details and information to develop ideas.	Used some details to support and develop ideas.	Details used were not sufficient enough to support and develop ideas.	No details used to support and develop ideas.
ORGANIZATION	Sophisticated arrangement of content with seamless transitions.	Sufficient arrangement of content with adequate transitions.	Inconsistent arrangement of content with or without attempts at transition.	Unruly arrangements of content without attempts at transitions.
GRAMMAR, USAGE & MECHANICS	No spelling, punctuation or grammatical errors.	Few spelling and punctuation errors, minor grammatical errors.	Moderate number of spelling, punctuation or grammatical errors.	Plenty of spelling, punctuation and grammatical errors.
STYLE	Used a variety of words and sentence structure with consistent tone and voice.	Sufficiently varied words and sentence structure with somewhat consistent tone and voice.	Limited variety of words and sentence structure with inconsistent tone and voice.	Minimal variety of words and sentence structure with inconsistent tone and voice.

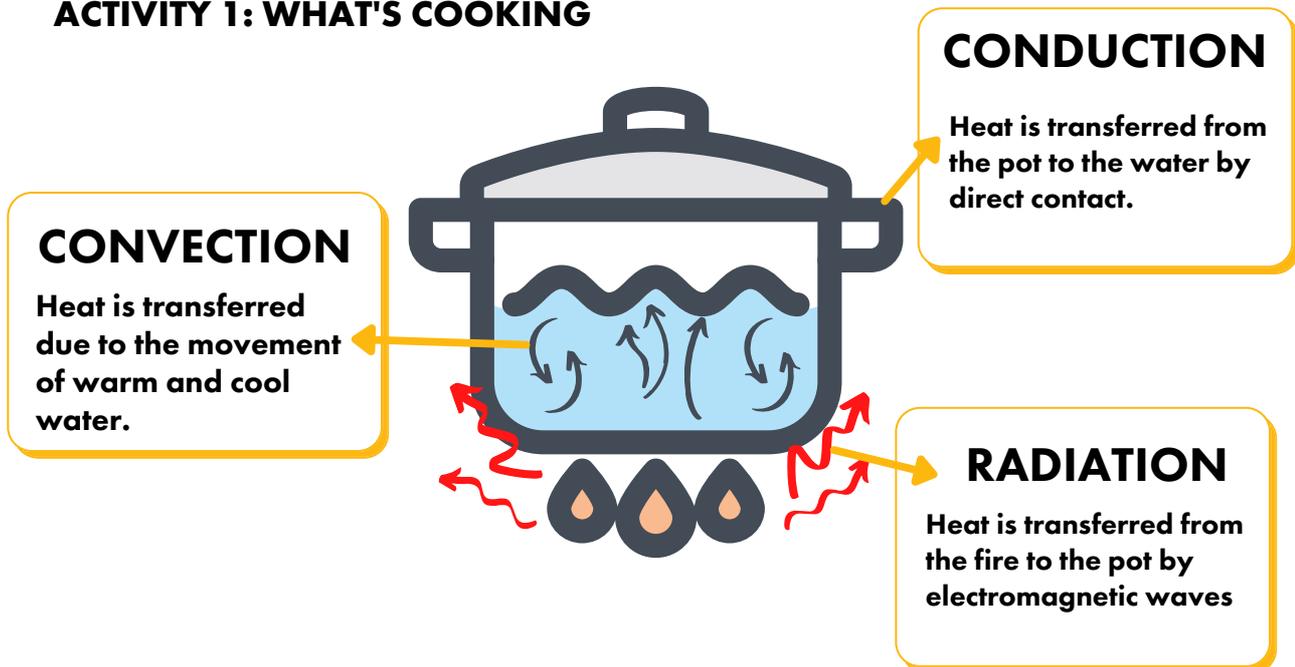
ACTIVITY 2: COMPLETE THE SPECTRUM

Electromagnetic Wave	Wavelength	Example uses <i>(Includes but not limited to the following)</i>	Frequency
Gamma Rays	less than 0.1 nm	<ul style="list-style-type: none"> Cancer therapy Art Restoration Sterilization of Food Material Gamma Ray astronomy 	<p>The higher the frequency, the shorter the wavelength.</p>
X-RAYS	about 1 nm	<ul style="list-style-type: none"> X-ray imaging (radiograph) Cancer therapy Luggage scanners in airports 	
Ultraviolet	10 - 100 nm	<ul style="list-style-type: none"> Sterilization and disinfection Used by the body to produce Vitamin D Treatment for some skin conditions 	
Visible Light	350 - 650 nm	<ul style="list-style-type: none"> Sight lighting up homes photography Photosynthesis in plants 	
INFRARED	about 0.01 mm	<ul style="list-style-type: none"> Night vision devices Temperature guns some remote controlled devices (TV remote) some electrical heaters 	
Microwaves	1 mm to 30 cm	<ul style="list-style-type: none"> Heating and cooking food Bluetooth technology Telecommunication Cancer therapy 	
Radio Waves	1 mm up to more than 100 km	<ul style="list-style-type: none"> Radio and TV broadcast Wi-Fi technology cellular phone telecommunication some remote controlled devices Radio telescopes for studying the universe 	



ANSWER KEYS [11-12]

ACTIVITY 1: WHAT'S COOKING



ACTIVITY 2: FREEFALL IN MICROGRAVITY

Q1: Describe what happened to the water when the bottle was stationary and the hole is not covered.

Sample Answer:

The water poured out of the bottle and on to the ground through the uncovered hole.

Q2: Describe what happened to the water as the bottle fell into the bucket.

Sample Answer:

The water stopped pouring out of the hole on the side of the bottle as it fell into the bucket.

Q3: Explain why these two situations (bottle stationary vs bottle falling) had different outcomes.

Sample Answer:

When the bottle is stationary and the hole is uncovered, gravity is pulling both the bottle and water toward the ground but only the water can fall through the hole.

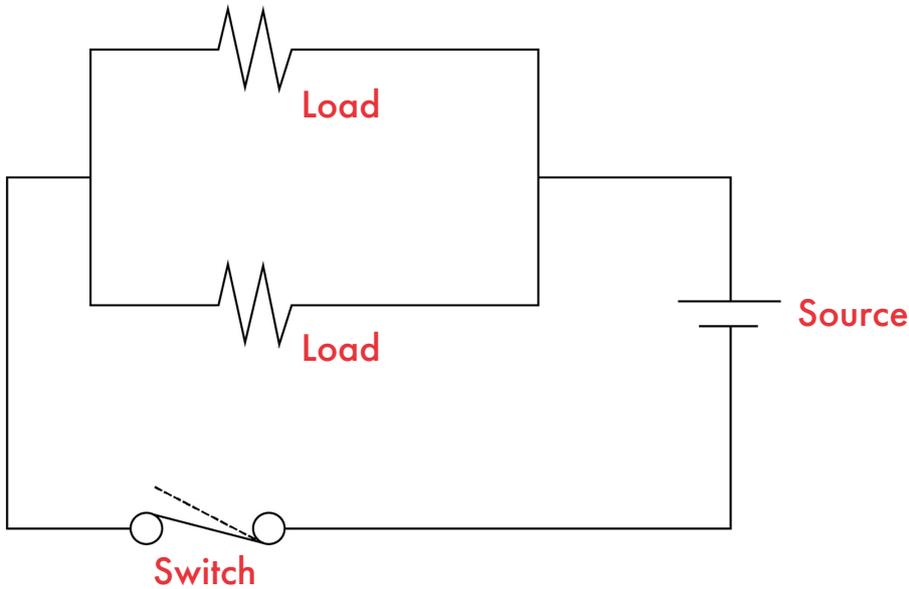
When the bottle is falling, both the bottle and the water inside are in free fall. The only force is the pull of gravity. Since they are moving at the same velocity, the water does not have the chance to push on the walls of the bottle and escape through the hole.



ANSWER KEYS [11-12]

ACTIVITY 4: LIGHTEN UP

Convert the illustration above to a schematic diagram, then label every component of the circuit.



What is the relationship between the current flowing out of the battery and the current flowing through bulb A and B?

Sample Answer:

The total current flowing out of the battery (I_{total}) is equal to the current flowing through A (I_A) plus the current flowing through B (I_B).

$$I_{\text{total}} = I_A + I_B$$

Electric current is made of moving charges. According to the Law of Conservation of Charge, charge cannot be created nor destroyed. This means that the total charge moving through a circuit must remain the same.

The charges flowing from the battery splits into two paths, one going to A and the other going to B. Following the Law of Conservation of Charge, the charge flowing through A and B must add up to equal the charge flowing from the battery.

What is the relationship between the voltage of the battery and the voltage across each bulb?

Sample Answer:

The bulbs are connected in parallel. In other words, both bulbs have a direct connection to the battery (no other bulbs are in the way from them to the battery). Because of this, the voltage across both bulbs is the same as the voltage across the battery.