

# NOTES

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# Science Expo

# 2024

## Physical Science

# Passport

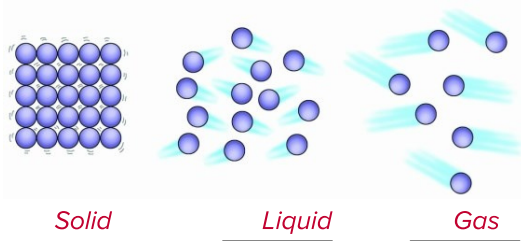
# Answer Key



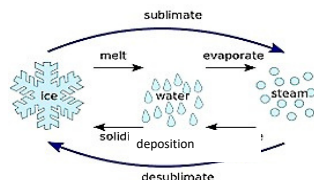
# Properties of Matter

## Physical Properties

**Matter on the Move:** What are the three states of matter?



**Phase Change Poppers:** What is the phase change called when a solid changes directly into a gas? *Sublimation*



**Invisible Mass:** Air has mass.

True or  False (Circle one)

**It's a Gas:** When citric acid and baking soda react, what gas bubbles out of the solution?

*Carbon dioxide*

**Slime Time:** What type of fluid acts like both a liquid and a solid?

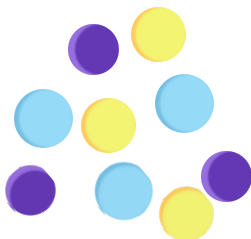
*Non-Newtonian fluid or "Oobleck"*



## Mixtures

**Separation Anxiety:** Are mixtures separated by chemical or physical means?

Chemical or  Physical (Circle one)



# Energy

## Light



**Color Combinations:** When you combine red, green, and blue light, what color light do you get? *White light*

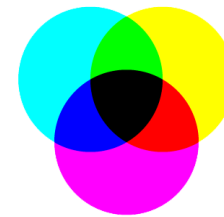
**Colored Shadows:**

What secondary colors are produced by the following primary light combinations?

Red + Blue = *Magenta*

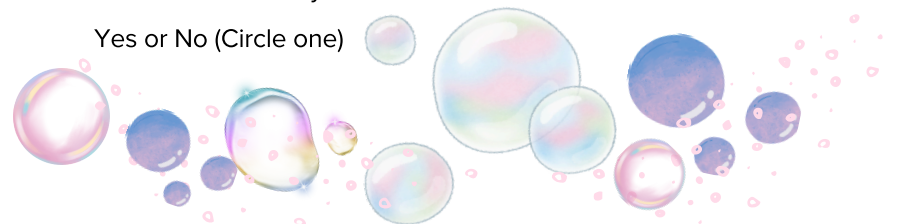
Blue + Green = *Cyan*

Green + Red = *Yellow*



**Great Wall of Color:** Did you see colors reflected in the bubble film?

Yes or No (Circle one)



**Refraction Action:** The bending of light is called *refraction*.



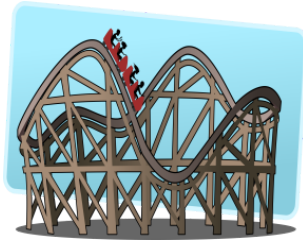
**Super Spectroscopes:** A spectroscope is a tool used for observing a spectrum of *visible light*.

**It's a Mirror-cle:** Why does it look like you are flying? *The foot off the ground is reflected and looks like a second foot.*



# Energy

## Mechanical



### Give it a Ride:

Potential energy is stored energy.

Kinetic energy is energy in motion.

**Keep Your Eye on the Ball:** Energy cannot be created or destroyed.

True or False (Circle one)

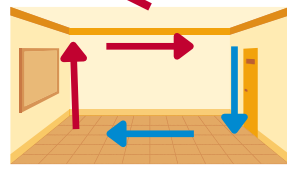
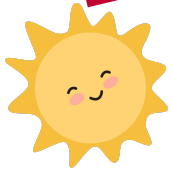
## Heat

**Some Like it Hot:** Name 3 methods of heat transfer and an example of each.

Conduction

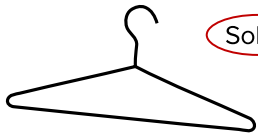
Convection

Radiation



## Sound

**Musical Coat Hangers:** Which is the best medium for sound waves to travel?



Solid

Liquid

Gas (Circle one)



**Seeing Sound:** What creates sound?

*Sound is created by a vibrating object.*

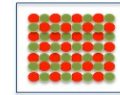
# Properties of Matter

## Density

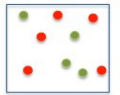
**Magic Hat:** What is the definition of density? *How tightly packed a material is and how much space it takes up or Mass/Volume.*

**Floating Golf Ball:** Which is more dense?

Freshwater or  Saltwater (Circle one)



High Density



Low Density

**Hot and Cold Density:** How can you change the density of water?

*You can change the density of water by changing the temperature.*

**Changing the Density of an Object:** Can two objects have the same volume but different densities?  Yes or No (Circle one)

**Stacking Colors:** Liquids that are more dense will have a higher viscosity (thickness).

## Chemical Reaction

**Gassy Lava Lamp:** What is a chemical reaction?

*A process that rearranges molecular structures of a substance*



**Exothermic vs. Endothermic:**

Exothermic reactions release energy in the form of heat. (For example, Calcium chloride mixed with water feels warm and can be used to melt ice.)

Endothermic reactions absorb energy in the form of heat. (For example, Urea mixed with water feels cold.)



# Forces & Motion

## Air Pressure

**Automatic Balloon Inflator:** Which takes up more space?

Hot air or Cold air? (Circle one)



**Mystery Candle:** Is the pressure higher or lower inside the flask?

Higher or Lower? (Circle one)

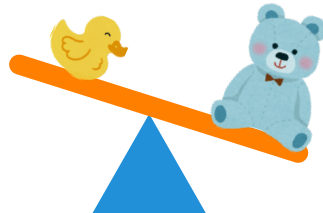


## Gravity

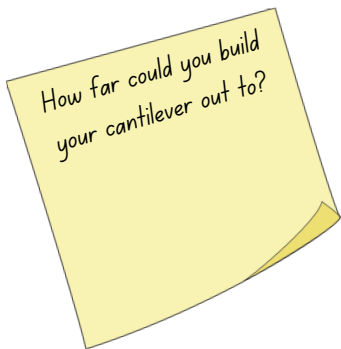
**Gravity keeps you down:** Air Resistance causes falling objects to slow down.

**Strike a Balance:** What physics concept keeps objects balanced?

The center of gravity of an object.



**Spanning the Distance:** A lever that is supported on only one end is called a cantilever.



# Forces & Motion

## Magnetism

**Magnet Magic:** Magnetic fields cause magnetic attraction and repulsion.



**Magnet Mania:** All metals are magnetic. True or False? (circle one)

## Properties of Water

**Magic Playing Card:** What bond is breaking when the water spills out? Adhesion OR Surface Tension.

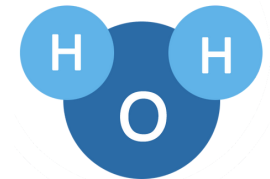
## H2Olympics:

Cohesion is the attraction between water molecules.

Adhesion is the attraction between water molecules and other materials.

Surface Tension is the strong bonds formed between water at the surface.

Capillary Action is the movement of water molecules within materials.



## Momentum

**Momentum Machine:**



Match the type of momentum to the photo.

Angular ←

Linear →

**Show Me the Momentum:**



**Hoverboard:** What is Newton's first law? *A body at rest stays at rest and a body in motion stays in motion unless other forces act upon it.*