

Physical Properties and Changes of Matter

Physical Properties— a characteristic of a substance that can be observed and measured without changing the identity of the substance

Physical Properties	Description and Examples
1. Color	ex red sweater, green grass
2. Shape	ex phone is a rectangular shape
3. Mass	- amount of matter in an object - use a balance scale
4. Volume	- how much space it takes up - $L \times w \times H$, water displacement - graduated cylinder
5. Density	- $\text{Mass} \div \text{Volume}$ - the amount of matter in a certain amount of space
6. Texture	Smooth, bumpy, rough
7. Conduct heat and electricity	- many metals
8. Melting and Boiling Point	- Change of state does NOT make a new substance
9. Malleability	- ability of a metal to be rolled or shaped (bend)
10. Luster	- way the substance reflects light
11. Magnetic Attraction	
2. Solubility	- ability of a substance to dissolve in another substance ex - Salt dissolves in water

Chemical Properties and Change Notes

Chemical Properties— describe a substance's ability to change into a new substance with different properties

1. Flammability— the ability to burn

1a. Nonflammability— does NOT have the ability to burn

2. Reactivity— ability of a substance to interact with another substance to form one or more new substances

2a. Stability— does NOT have the ability to react with another substance

Evidence of a Chemical Change (Reaction)	Meaning	Examples
1. Change in smell	A change in smell indicates that the chemical properties of something have changed.	- hamburgers smell different before + after they have been cooked - rotting food - burning paper
2. Color change	A color change indicates that the chemical properties of something have changed. (Note: adding a dye like food coloring does not count)	- Chicken changes from pink to white after being cooked - leaves changing in autumn - rusting of iron to iron oxide - iodine + starch - rotting bananas
3. Gas is evolved Bubbles, fizz	Gas that is given off when solids and/or liquids mix (Note: heating a liquid to vaporize it does not count)	- vinegar + baking soda (CO_2 evolved) - mentos + coke - Elephant's Toothpaste (YouTube video)
4. Energy is given off	This can be in the form of light or sound	- fireworks give off light and sound - bacon sizzling - Glo stick
5. Temperature change	A change in temperature is another form of energy being given off. (Note: changing the temperature externally by heating or cooling does not count, the change must come from the reaction)	- breakable ice packs - hand warmer packs - Icy Hot