Chemical Equations and Reactions:

Signs of a Chemical Reaction

Chemical Reactions

- You have learned about physical changes and chemical changes.
- A physical change does not change the substance itself but chemical change does.
- When a substance undergoes a chemical change, it takes part in a **chemical reaction**.

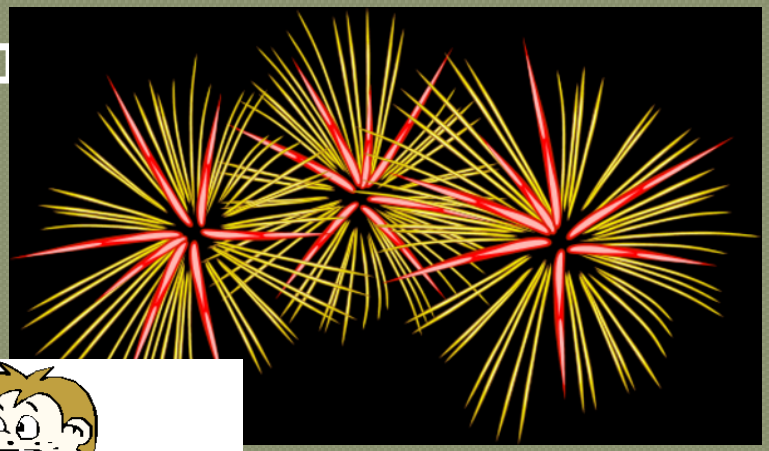
Chemical Reactions

- For example, when methane, CH_4, in natural gas combines with oxygen, O_2, in the air and burns, carbon dioxide, CO_2, and water, H_2O, are formed.

Examples of Chemical Reactions

- Heating a home
- Power for a car
- Manufacturing fabrics for clothes
- Making medicines
- Producing paints
- Provide energy for you to run, walk, work and think
- Making fireworks!

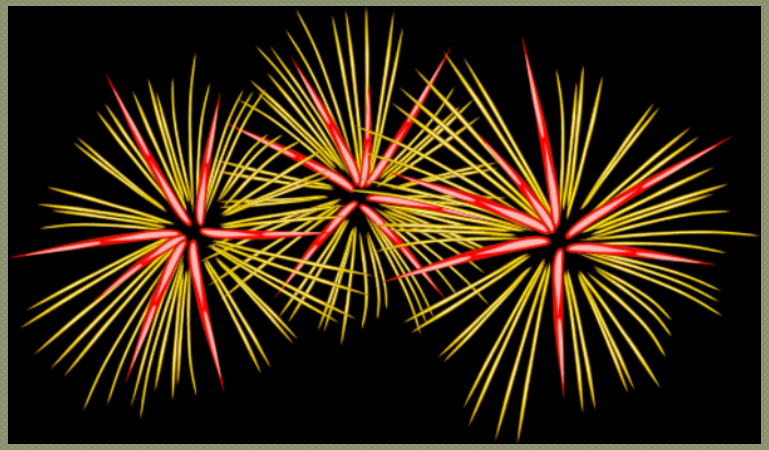
- Chemical reactions happen around you all the ti



Signs of Chemical Reaction
How do you know if a chemical reaction occured/?

1. Color changes
2. Precipitation of a solid
3. Energy changes
4. Odor changes
5. Gas release

Examples of Chemical Reactions



- Color change
- Odor
- Energy change (sound/light given off)

- Color change
- Light energy given off

Examples of Chemical Reactions

- Steel changes from smooth, shiny material to reddish-brown= color change
- A blue flame appears when natural gas reacts with oxygen= color change and energy release

Signs of Chemical Reactions

- **So, you can see, chemical reactions give *visual* clues:**
- **A color changes. A solid forms. Bubbles are produced. A flame occurs. A precipitate (solid) forms.**

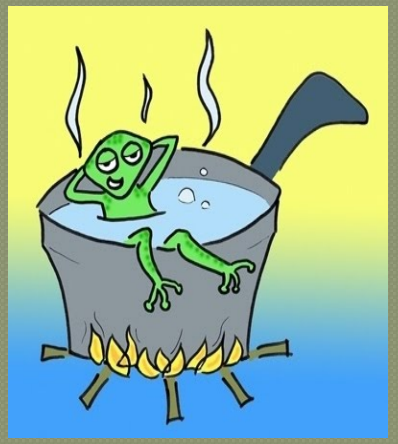
Signs of Chemical Reactions

- Reactions, however, are not always visible. Sometimes the only signal that a reaction is occurring is a change in temperature as heat is produced or absorbed.

- People use cold packs to help prevent swelling after an injury. The pack is activated by breaking an ampule; which starts a chemical reaction that absorbs heat rapidly, lowering the temperature of the area to which the pack is applied.

- A hot pack is used to warm hands and feet in winter. When the package is opened, oxygen from the air penetrates a bag containing solid chemicals. The resulting reaction produces heat.

Signs of Chemical Reactions Caution



- Many important clues indicate when chemical reactions occur. None of them alone proves that a chemical change occurred.
- Some physical changes such as boiling or coloring with a marker or crayon involve some of these signs but are not chemical in nature.

The End