

Similarities and Differences: Learning Packet



Essential Questions:

1. How are concepts in science alike and different?
2. How can we teach identifying similarities and differences?
3. What strategies can I use in my classroom with my content and skills?

Directions for Today's Learning: *Please go through the stations in the order given to you on your index card. Have fun...and learn!*

No amount of experimentation can ever prove me right; a single experiment can prove me wrong.

Albert Einstein

Science does not know its debt to imagination.

Ralph Waldo Emerson

SIR WILLIAM BRAGG:

The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them.

HELEN KELLER:

Science may have found a cure for most evils; but it has found no remedy for the worst of them all -- the apathy of human beings.

Estimated amount of glucose used by an adult human brain each day, expressed in M&Ms: 250

Harper's Index, October 1989

Station 1: Classifying

Notes from Powerpoint and text book:

Notes	What I am thinking..

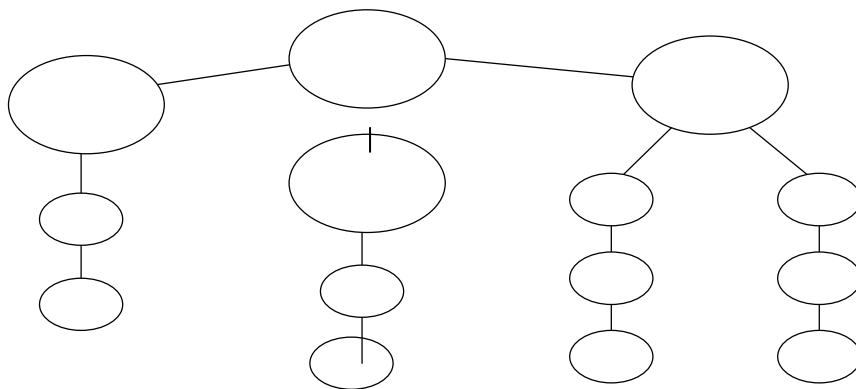
Explanation

1. Amoeba				<div></div>
2. Fungi				
3. Human				
4. Fern				
5. Sodium				
6. Paramecium				
7. Oxygen				
8. Starfish				
9. Iron				
10. Earthworm				

Absorption	duration of insolation	Latent
adiabatic cooling/heating	El Nino	Leeward
air mass	Evaporation	maritime air mass
Anemometer	Front	Monsoon
anti-cyclone	Fusion	occluded front
Barometer	global wind and pressure belts	Orographic
Climate	Gradient	polar air mass
Clouds	greenhouse effect	Precipitation
cold front	Groundwater	Pressure
Conduction	Hurricane	Psychrometer
continental air mass	Insolation	Radiation
Convection	Isobars	rain gauge
Coriolis effect	Isotherms	Reflection
Cyclone	jet stream	Refraction
dew point	La Nina	relative humidity

Identifying Similarities and Differences

Graphic Organizer for Classifying



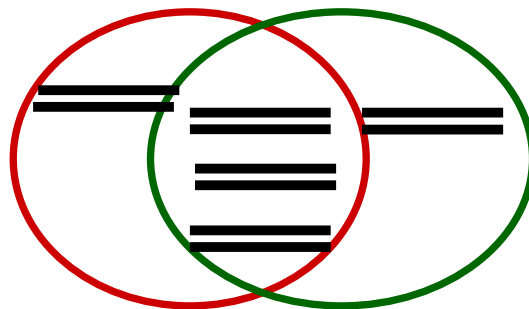
Station 2: Comparing

Notes from Powerpoint and Text:

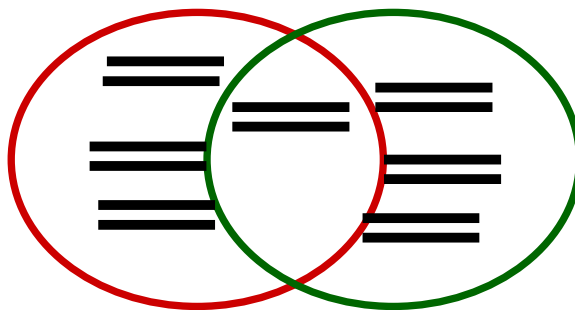
Notes	What I am thinking..

Respiration

Photosynthesis



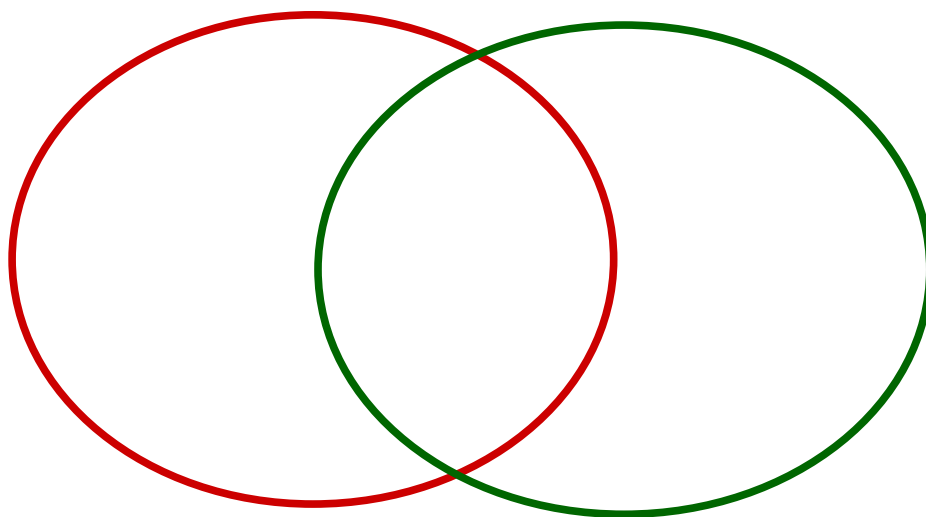
Characteristic Effect on the environment



Characteristic Energy transformation

Bohr Model

Cloud Model

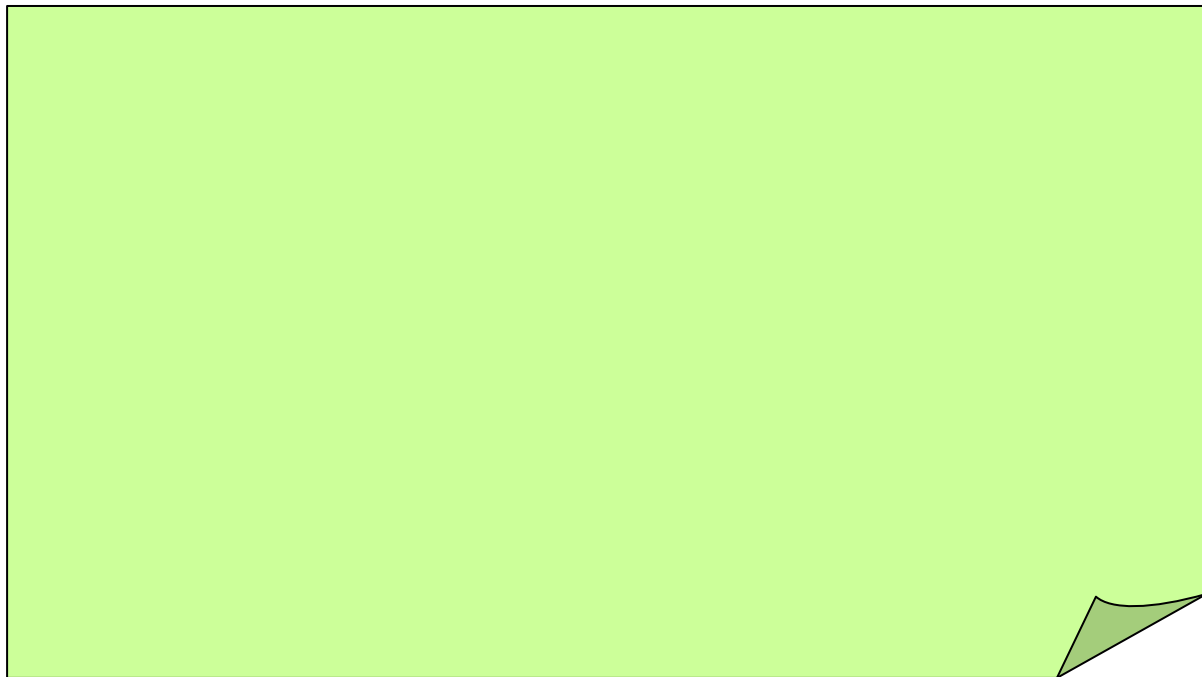


Characteristic Location of electrons

In both the Bohr and Cloud model, the electrons move around the outside of the nucleus. However, the location of the electrons in Bohrs model was circling the nucleus in a definite pattern and energy level. In the modern cloud model, the electrons are moving around the nucleus, but there is no pattern to the movement, it is dependent on the energy level of that electron.

	Item 1	Item 2	Item 3	
Characteristic 1				Similarities and Differences
Characteristic 2				Similarities and Differences
Characteristic 3				Similarities and Differences
Characteristic 4				Similarities and Differences

Personal Reflection:



What pieces from last training need to be in place for this type of activity and formative assessment?



Station 3: Creating Analogies

Notes from Powerpoint and text book:

Notes

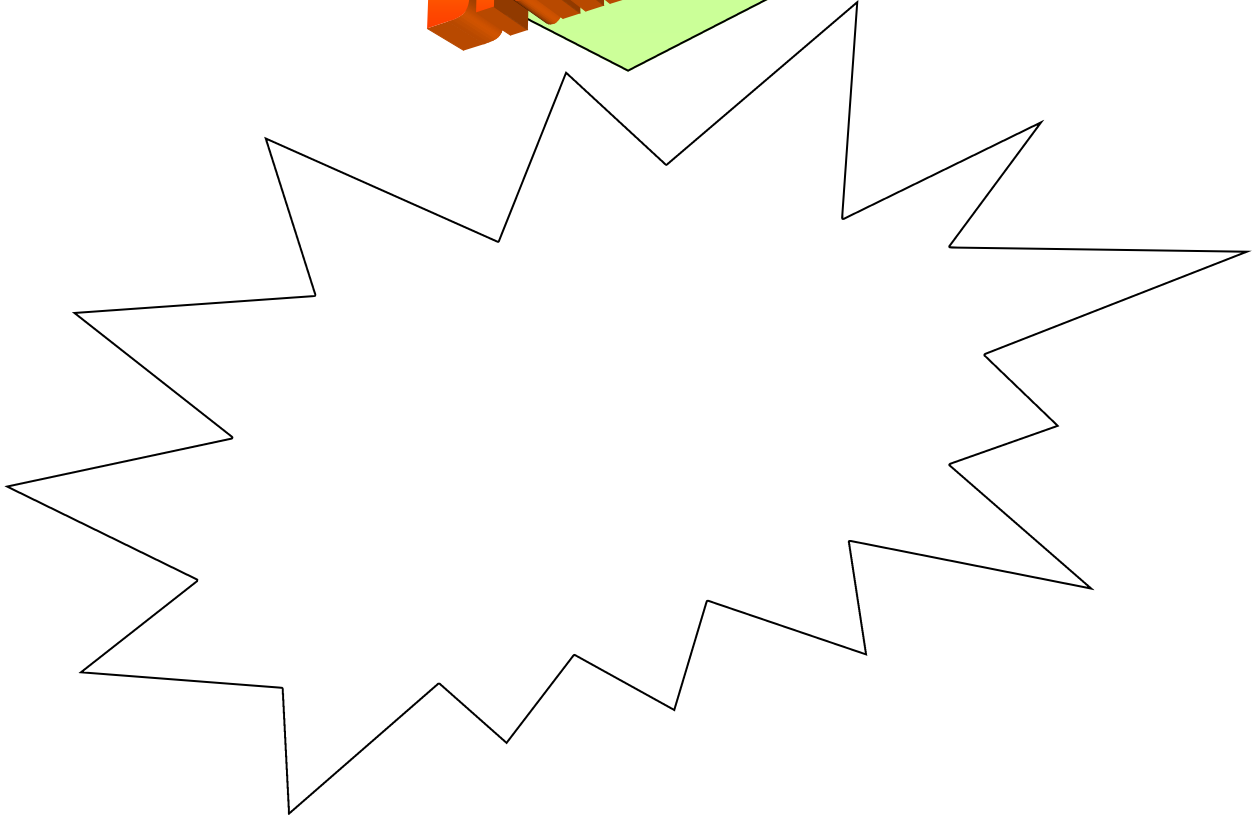
What I am thinking..

What I found useful on the websites.....

My understanding of using analogies...

My next steps...what lesson or lessons could I use? We will have the afternoon to create lessons!!

Brainstorm



Station 4: Creating Metaphors

Notes from Powerpoint and text book:

Notes

What I am thinking..

Creating Metaphors

- Give students a model that contains a mental image
 - He was walking on thin ice
 - She was a grizzly bear in the mornings
 - Plum pudding atom model
 - A cell is a factory
 - The enzyme-substrate lock-and-key model
 - A DNA molecule is a ladder

What makes these metaphors????



Practice with an example from your content area!

Graphic Organizer for Metaphors

Element	Literal Pattern	Abstract Relationship	Literal Pattern	Element

use page 36 as a guide

- Disease is _____
- The brain is _____
- Atoms are _____
- The Earth's Crust is _____

Explain your thinking (metacognition)...

GAMES

	(1) Telescope	(2) Photosynthesis	(3) Mitochondria	(4) Convection
	Stars Observatory Astronomer Planet look	Light Leaves Chlorophyll Green sunlight	Organelle Powerhouse Cell ATP respiration	Heat Rise Cold Dense Sink

Buzzed words

Metaphor—Camera —
creates something using

Have them create metaphors (each student gets 2-3 words to create metaphors for) and they can only use the metaphors to describe the term in review setting/game playing...get buzzed for buzzed words.

Thoughts