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Matter \$25

Extensive & Intensive Properties ctr (1:53) ... used to classify matter

Electrical Conductivity (Properties) ctr (1:13) ... solids & water

Electrical Conductivity (Properties) ctr (1:31) ... solutions

Mass of Ice Before and After Melting (0:41)

Classifying Matter Notes ctr (1:52) ... Graphic Organizer ... Pure substances versus mixtures.

17 Samples of Classifying Matter ctr (6:10) ... Non-uniform mixtures/suspensions/colloids are all heterogeneous.

Density: An Intensive Property ctr (1:12) ... Beware of Whacky Scientists!

Physical Versus Chemical Properties ctr (2:36) Discussion & "Burning Water"

Physical Versus Chemical Changes LAB ctr (5:01) ... demonstrations (part 1)

Physical Versus Chemical Changes LAB ctr (5:04) ... demonstrations (part 2)

Separating Mixtures: Distillation ctr (2:32)

States of Matter

Kinetic Theory ctr (2:01) using a super ball

Pressure Demonstrations (5:32)

- **PSI (Breaking a Board using Atmospheric Pressure)**
- **Manometer Readings**
- **Boiling Water below 50 C**

Collapsing Can (0:47)

Sublimation of Dry Ice (1:59)

Vapor Pressure of a Liquid, Dynamic Equilibrium & Boiling (10:00) Part 1 end of notes

Vapor Pressure & Temperature; Phase Diagram (6:57) Part 2 end of notes

Kinetic Theory Involving Pressure, Volume & Temperature Using a Manometer (5:55)

Liquid Equilibrium & Vapor Pressure (7:30) ... defining boiling point.

Practice reading Graphs of Equilibrium Vapor Pressure and Phase Diagram (5:08)

Measurement \$20

Measurement Overview: Metric System, Factor Labeling, Scientific Notation & Uncertainty ctr (2:20)

Measurement Overview: Metric System (Prezi)

Metric Units Song (2:51) ... metric units for each category of measurement (m, l, g)

Metric Progression Song ... learn the metric units (1:18)

Metric Progression & Factor Labeling Basics ctr (4:13)

Factor Labeling "Thumbs Up / Thumbs Down" Rule ctr (4:10)

Factor Labeling Example (negative exponents) ctr (3:34)

Scientific Notation Overview ctr (3:31)

Scientific Notation: Adding/Subtracting ctr (1:22)

Scientific Notation: Multiplying/Dividing ctr (0:58)

Significant Figures: Precision Part 1 ctr (3:28)

Significant Figures: Precision Part 2 ctr (6:24)

Factor Labelling (Converting Units) Class Notes (8:57)

Density Demonstration (Intensive Property) ctr (1:02) ... two cans of pop

Density: An Intensive Property ctr (1:12) ... Beware of Whacky Scientists!

Measuring Density Part 1 ctr (0:17) ... distinguishing regular versus irregularly shaped objects AND

Measuring Density Part 2 ctr (2:57) ... measuring mass and volumes of various objects to determine density.

Calculating Density (Triangle Method) ctr (1:19) ... "I love density" & the triangle method

Atomic Structure \$25

Isotopes & Weighted Atomic Mass (Relative Abundance) (5:17) ... completes class notes

Van Der Graaf Demo [Charges Exist] (1:15)

The Atom: Electrostatic Force Demonstrations ctr (2:59) ... first 1:30 minutes is the Acrylic Tape Demo; Then, a balloon demo shows friction, induction and conduction.

Video Links for Chemistry

Crookes' Tube: Cathode Ray deflected by Magnet (Electrons) (1:07)

Millikan Oil Drop Experiment (Mass to Charge Ratio) (1:14)

The Nucleus: Atoms are mostly empty space (0:48)

Rutherford's Experiment: Atom's center is a Nucleus (0:47)

Atomic History Song (Mark Rosengarten (4:14)

Modern Atomic Theory

PHET Simulation: Atomic Model History (5:37)

Electron Configuration (Review) Song (3:24)

Introduction to Quantum Numbers / Electron Configuration ctr (4:38)

Principal Quantum Number: Energy Levels (Size ... n) ctr (5:12)

Second Quantum Number: Sublevels (Shape) ctr (5:22)

Recap of Quantum Numbers 1 & 2 ctr (2:36)

Third Quantum Number: Orbitals ctr (6:25)

Fourth Quantum Number: Spin ctr (4:57)

Energetics of Quantum Numbers ctr (4:51) ... discusses all 4 quantum numbers with energy in view

Pauli Exclusion Principle & Hund's Rule ctr (4:41)

Diagonal Rule & Electron Configuration Example ctr (3:06)

Periodic Table

The Periodic Table Song (2:44) ... over 100 elements.

Tom Lehrer's The Elements Song (1:26) 1970

The Periodic Table Review Song (3:07) ... Periods, Groups, Valence, Electronegativity (Review).

Ionic & Metallic Bonding \$10

Electron Dot Diagrams ctr (6:59)

Electron Dot Diagrams (Lewis Structures) (4:57) 5 Steps

Ionic Bonds & Ionic Compounds ctr (4:30)

Ionic Bonding Electron Configurations (H + F) ctr (4:23)

Ionic Bonding Electron Configurations (Na + S) ctr (3:19)

Electrical Conductivity ctr (1:13) ... solids in water AND Electrical Conductivity ctr (1:31) Ionic & Covalent Compounds dissolved in water.

Conductivity of Dissolved Substances (1:29) ... tap, distilled, salt, HCl, NaOH, sugar, vinegar, ethanol, BaSO₄ (Beware of weird guy!)

Conductivity of Solids & Aqueous Solutions Lab (1:30) For Lab Activity ... Metals, Ionic Compounds ... similar to lab

Metallic Properties & Bonding ctr (3:04)

Covalent Bonding \$10

Covalent BONDing (Polar Versus Non-Polar) ctr (5:53)

Covalent MOLECULES (Polarity & Geometry) ctr (4:24)

Recap of BOND Polarity ctr (4:13) ... molecular models

Recap of Covalent MOLECULE Polarity & Geometry ctr (2:05) ... molecular models

The Bonding Song (3:07) ... Ionic & Covalent Bonds (Review).

Hybrid Bonds

Sigma & Pi Bonds (3:12)

Hybrid Orbitals ctr (4:43)

sp (linear), sp² (trigonal planar), sp³ (tetrahedral)

Molecular Attractions (InTRAmolecular bonds versus InTERmolecular Attractions) ctr (7:05)

LDF, H-bonds, VDW, Molecule-ion, Network Solids, Metallic Bonds

Electron Dot Diagrams (Lewis Structures) (4:57) 5 Steps

Determining Oxidation State (7:09)

Determining oxidation state of atoms and molecules.

Formulas \$6

Chemical Formulas & Oxidation Numbers ctr (7:43) ... element symbols, subscripts, coefficients, oxidation states

Writing Chemical Formulas ctr (4:18) Oxidation & Criss Cross Method

Naming Chemical Formulas (Introduction) ctr (1:57) Naming elements, HOFBrINCl (diatomic) Molecules, & Ionic (Binary) Compounds.

Naming Covalently Bonded Molecules (6:11)

Naming Acids/Bases

Naming Acids ctr (5:41) Binary Acids & Acids Containing Oxygen

Molar Quantities

Mole Day: October 23 (1:58)

Reactions \$12

Activation Energy Demo: Sulfuric Acid + Sugar (1:05)

Types of Chemical Reactions (5) Overview (3:56)

Synthesis or Combination Reactions (3:21)

Synthesis or Combination Reactions: Magnesium (1:22)

Synthesis of Water (2:15) ... in the classroom!

Synthesis of Water (0:38)

Decomposition Reactions (5:12) Write and Balance equations.

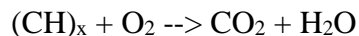
Single Replacement Reactions (4:33)

Double Displacement/Replacement Reactions (5:48) ... Formation of a Precipitate, Solubility Chart, Ionic Equations, Net Ionic Equations, Spectator Ions.

Example 1 of Double Displacement/Replacement Reaction (2:28) ... Ionic Equation, Net Ionic Equation, Spectator Ions

Example 2 of Double Displacement/Replacement Reaction (3:24) ... Ionic Equation, Net Ionic Equation, Spectator Ions

Combustion Reaction: Calcium Carbide Canon (2:47)



Stoichiometry

Butane exploding in a tennis ball canister (1:28). (See Learning CTR Online labs for details)

Stoichiometry Rules (1:53) Song by Mark Rosengarten

Stoichiometry Sample Problem (9:21) Khan Academy

Gas Laws \$6

Pressure Demonstrations (5:32)

PSI (Breaking a Board using Atmospheric Pressure)

Manometer Readings

Boiling Water below 50 C

Collapsing Can (0:47)

Charles' Law & Gay-Lussac's Law ctr (3:12)

Kinetic Theory ctr (2:01) super ball and elastic collisions

Boiling Water Using ICE! ctr (3:08)

Water & Solutions \$9

Dancing Water ctr (1:09) ... Polarity of Water

Dissolving (Dispersion) & Hydration (1:19) How Water Dissolves Salt

Video Links for Chemistry

Solution Formation: Dissolving (Dispersion) / dissociation & Hydration (0:46) animation

Electrolytes: The Electric Pickle (2:07) Stephen Spangler

Factors Affecting Solubility & the Rate of Solubility ctr (4:08)
stirring/agitation, surface area, temperature, pressure

"Seeding" a Supersaturated Solution (1:29)

The Atheist's Delusion (11:39) ... Thought Provoking.

Electrostatic Attractions show Polarity (2:59)

Solubility (polar and non-polar substances) (2:24)

Colligative Properties

Colligative Properties: FP Depression & BP Elevation (4:17)

Thermochemistry \$6

Heating & Cooling Curve Worksheet Tutorial (8:52)

Activation Energy: Lycopodium Powder Explosion (2:04)

Heating Curve of Water (Time Lapse) (1:12)

Endothermic Change, but Temperature Drops??? (0:48)

Heating Curve Song (3:20) ... PE, KE, Endo & Exothermic, Graphing Phases (Review).

Heat of Reaction

Calculating Heat of Reaction Tutorial (7:28)

Heating Curve Song (3:20) ... PE, KE, Endo & Exothermic, Graphing Phases (Review).

$q = m c \Delta T$ Song (3:20) ... (Review).

Equilibrium Reaction Rate \$3

Equilibrium Tutorial (10:09) Completes Class Notes for this week.

Flaming Bubbles (0:38)

Spontaneity

Gibb's Free Energy Tutorial (8:14) ... general overview and 4 practice problems

Acid / Base \$6

Rainbow Connection (4:04) Acid-Base Indicators

Bronsted-Lowry Acids & Bases (5:39)

Titration

Neutralization & Hydrolysis of a Salt ctr (9:08) Includes practice problems.

Titration (1:18)

Titration & Buffers ctr (10:26) Includes titration graph interpretation (adding acid to base or base to acid)

REDOX & Electrochemistry \$2 (*with any other Set*)

Determining Oxidation State (7:09)

Electrochemistry Song: It's Starts at the Anode" (Mark Rosengarten) (3:28)
