Khan Academy Video Correlation / Alignment
Chemistry

TEKS/SE	Curriculum Unit(s)	Video Title	Rationale *(e.g., explanation, justification, etc.)*
Ⓢ **CHEM.4C** Compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume.	Unit 1	F-1 States of Matter	The video extensively discusses how the state of matter changes due to the absorption or release of heat (energy). The video also includes how the kinetic and potential energy changes during the changes of states of matter. Furthermore, the compressibility, structure and the volume of the matter are compared from one state to another.
Ⓢ **CHEM.4C** Compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume.	Unit 1	F -2 States of Matter (Follow-Up)	The forth form of state of matter, plasma is discussed. Also explained how the hydrogen bond is formed in the polar molecules like water. The video also explained why hydrogen bond is possible with molecules formed from H-O, H-F, and H-N.
Ⓢ **CHEM.4C** Compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume.	Unit 1	F-5 Phase Diagrams	The video is helpful to support the SE 4-C. It shows how temperature and pressure are directly related to the matters in their phase change (state change).
Ⓡ **CHEM.4D** Classify matter as pure substances or mixtures through investigation of their properties.	Unit 1	F-9 Suspensions, Colloids, and Solutions	Describes the different types of mixture, suspensions, colloids, and solution. Further show how the homogeneous mixture differs from heterogeneous mixtures.
Ⓢ **CHEM.5A** Explain the use of chemical and physical properties in the historical development of the Periodic Table.	Unit 2	C-2 Valence Electrons	The video describes electron configuration of the elements, including Transition Metal, in short method and long method. It also talks about the previous d- shell by drawing energy levels. It describes how period is related to outer most shell energy level, and how the number of electrons are coming from group number. It describes why elements want to get eight electrons.
Ⓡ **CHEM.5B** Use the Periodic Table to identify and explain the properties of chemical families,	Unit 2	C-1 Groups of the Periodic Table	This video describes group, valence electron, and different groups for metals. It also talks about octet rule, exception of octet rule, d- shell for transition metal, and conductivity(Ag metal is the best conductor for heat and electricity).

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including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals.			
Ⓡ **CHEM.5C** Use the Periodic Table to identify and explain periodic trends including atomic and ionic radii, electronegativity, and ionization energy.	Unit 2	C-3 Periodic Table Trends: Ionization Energy	This video gives the definition of ions, molecules and ionization energy, why group one has low ionization energy. How electron is easy or hard to move from its outer most shell. It draws a line to the relation of ionization energy in between two elements (F and Fr). It also shows the trends of ionization energy.
Ⓡ **CHEM.5C** Use the Periodic Table to identify and explain periodic trends including atomic and ionic radii, electronegativity, and ionization energy.	Unit 2	C-4 Other Periodic Table Trends	It talks about 2nd ionization energy, electro negativity, metallic character and atomic radius. It makes a relation between ionization energy and electro negativity (same). It describes polar covalent bond and electro negativity coming from polar covalent bond. It describes metallic bond to show metals want to donate electron, and atomic radius has opposite trends of ionization energy and electro negativity.
Ⓡ **CHEM.5C** Use the Periodic Table to identify and explain periodic trends including atomic and ionic radii, electronegativity, and ionization energy.	Unit 2	G-3 Mini-Video on Ion Size	Video is about the relative sizes of anions and cations of elements in the same period. Video compares Na^+ to Cl^- and explains why Na^+ is significantly smaller.
Ⓡ **CHEM.5C** Use the Periodic Table to identify and explain periodic trends including atomic and ionic radii, electronegativity, and ionization energy.	Unit 2	I-1 Introduction to Oxidation States	Video reviews electronegativity as it relates to oxidation-reduction atoms.
Ⓢ **CHEM.6A** Understand the experimental design and conclusions used in the development of modern atomic theory including Dalton's Postulates, Thomson's discovery of	Unit 3	A-1 Elements and Atoms	This video is about elements, atoms and subatomic particles in an atom (electron, proton and neutron).

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electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom.			
Ⓢ **CHEM.6A** Understand the experimental design and conclusions used in the development of modern atomic theory including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom.	Unit 3	A-2 Introduction to the Atom	It is a very descriptive video about elements and the subatomic particles in an atom. It has graphic description to understand the concept about atom and how subatomic particles are arranged in an atom.
Ⓢ **CHEM.6A** Understand the experimental design and conclusions used in the development of modern atomic theory including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom.	Unit 3	B-1 Orbitals	This video describes about orbital relates to Bohr's model. It also describes the shell and sub shell and how electrons are arranged in shell and sub shell.
Ⓡ **CHEM.6E** Express the arrangement of electrons in atoms through electron configurations and Lewis valence electron dot structures.	Unit 3	G-1 Introduction to Kinetics	Video begins with the drawing of several Lewis dot structures and explanations of those drawings. Video begins with a drawing of an electron dot structure of a molecule and an explanation of the covalent bond within.
Ⓡ **CHEM.7C** Construct electron dot formulas to illustrate ionic and covalent bonds.	Unit 4	G-1 Introduction to Kinetics	Video begins with the drawing of several Lewis dot structures and explanations of those drawings. Video begins with a drawing of an electron dot structure of a molecule and an explanation of the covalent bond within.
Not correlated directly with the SE but can be used to reinforce during CHEM.7C	Unit 4	F-7 Covalent Networks, Metallic, and Ionic Crystals	The video is not directly related to the SE 7C however it explains the concept which is helpful to understand why we learn to draw electron dot structure.

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bonds.			
Ⓡ **CHEM.7C** Construct electron dot formulas to illustrate ionic and covalent bonds.	Unit 4	C-5 Ionic, Covalent, and Metallic Bonds	This video describes ionic bond and how ions form before they make the bond, and why do they lose or gain electrons to form cation and anion. It also describes about covalent bond with some examples (O_2, H_2O).
Ⓢ **CHEM.7D** Describe the nature of metallic bonding and apply the theory to explain metallic properties such as thermal and electrical conductivity, malleability, and ductility.	Unit 4	C-5 Ionic, Covalent, and Metallic Bonds	Metallic bond is described in this video, and why and how metals like to donate electrons.
Ⓢ **CHEM.7D** Describe the nature of metallic bonding and apply the theory to explain metallic properties such as thermal and electrical conductivity, malleability, and ductility.	Unit 4	F-7 Covalent Networks, Metallic, and Ionic Crystals	Discusses why metallic bond is flexible compare to ionic bond due to the movement of electrons between the atoms. Compares the ionic structure and covalent structure to illustrate the properties of metal and why metals have properties of malleability, electrical conductivity and ductility.
Not correlated directly with the SE but can be used to reinforce during CHEM.7D		F-6 Van Der Waals Forces	Van Der Waals Forces are important in order for students to understand how the molecules are formed due to different types of intermolecular forces.
Ⓡ **CHEM.9A** Describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas, as described by Boyle's Law, Charles' Law, Avogadro's Law, Dalton's Law of partial pressures and the ideal gas law.	Unit 8	F-8 Vapor Pressure	Shows how do the volume, temperature, and pressure are interrelated. It illustrated, how the temperature is different from the heat and how heat cause temperature change causing the pressure.
Ⓡ **CHEM.9A** Describe and calculate the relations	Unit 8	F-11 Boiling Point Elevation and Freezing Point Suppression	Explains how the boiling point and freezing point can be varied due to the kinds of solute in the solution. Well

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between volume, pressure, number of moles, and temperature for an ideal gas, as described by Boyle's Law, Charles' Law, Avogadro's Law, Dalton's Law of partial pressures and the ideal gas law.			explained the calculation of molality calculation.
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Ⓡ **CHEM.9A** Describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas, as described by Boyle's Law, Charles' Law, Avogadro's Law, Dalton's Law of partial pressures and the ideal gas law.	Unit 8	E-6 Partial Pressure	This video is describing and calculating number of moles for each substance from the total mass and percent mass for each substance. It also shows how to calculate partial pressure by using the mole for each substance.

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Ⓢ **CHEM.9C** Describe the postulates of kinetic molecular theory.	Unit 8	E-7 Vapor Pressure Example	This video brings an example to make a true condition for true situation. It started with question and solves that question step by step. First of all, it solves for mole. After that, it solves for mass with a given substance. Then solves for volume with density and mass. After it has done all of this calculation, the video gives a solution that volume was only half of the given volume.
Ⓢ **CHEM.10C** Calculate the concentration of solutions in units of molarity.	Unit 6	F-9 Suspensions, Colloids, and Solutions	Describes the different types of mixture, suspensions, colloids, and solution. Further show how the homogeneous mixture differs from heterogeneous mixtures.
Ⓢ **CHEM.10C** Calculate the concentration of solutions in units of molarity.	Unit 6	F-11 Boiling Point Elevation and Freezing Point Suppression	Explains how the boiling point and freezing point can be varied due to the kinds of solute in the solution. Well explained the calculation of molality calculation.
Ⓢ **CHEM.10D** Use molarity to calculate the dilutions of solutions.	Unit 6	F-9 Suspensions, Colloids, and Solutions	Describes the different types of mixture, suspensions, colloids, and solution. Further show how the homogeneous mixture differs from heterogeneous mixtures.
Ⓢ **CHEM.10D** Use molarity to calculate the dilutions of solutions.	Unit 6	F-11 Boiling Point Elevation and Freezing Point Suppression	Explains how the boiling point and freezing point can be varied due to the kinds of solute in the solution. Well explained the calculation of molality calculation.
Ⓡ **CHEM.10E** Distinguish between types of solutions such as electrolytes and nonelectrolytes and unsaturated, saturated, and supersaturated solutions	Unit 6	F-10 Solubility	The video starts with the introduction of ionic compound (salt) and shows why (how) water molecule dissociate ionic compound forming electrolytes in the water. The later part of video explains the term saturated solute in the water vs. in gas state and shows how the temperature in this two different states plays role in the solubilities.
Ⓡ **CHEM.10F** Investigate factors that influence solubilities and rates of dissolution such as temperature, agitation, and surface area.	Unit 6	F-10 Solubility	The video starts with the introduction of ionic compound (salt) and shows why (how) water molecule dissociate ionic compound forming electrolytes in the water. The later part of video explains the term saturated solute in the water vs. in gas state and shows how the temperature in this two different states plays role in the solubilities.

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Ⓡ **CHEM.10H** Understand and differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions.	Unit 7	I-1 Introduction to Oxidation States	Video defines oxidation and reduction and discusses oxidation states, necessary for identifying oxidation-reduction reactions. Video begins with a review of how to draw dot formulas for NaCl and H_2O.
Ⓡ **CHEM.10H** Understand and differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions.	Unit 7	I-2 More on Oxidation States	Video defines more oxidation states, necessary for identifying oxidation-reduction reactions, and includes more practice.
Ⓡ **CHEM.10H** Understand and differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions.	Unit 7	I-3 Hydrogen Peroxide Correction	Video discusses a special case oxidation state, necessary for identifying oxidation-reduction reactions.
Ⓡ **CHEM.10H** Understand and differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions.	Unit 7	I-4 Redox Reactions	Video defines oxidation and reduction, discusses oxidation-reduction reactions, and shows/practices balancing several.
Ⓢ **CHEM.10I** Define pH and use the hydrogen or hydroxide ion concentrations to calculate the pH of a solution.	Unit 7	G-8 Introduction to pH, pOH, and pKw	Video begins with explanation of the autoionization of water and defines K_w. At the 12:54 mark, the video defines pK_w and discusses how to use K_w and pK_w in calculations to find $[H^+]$ and $[OH^-]$, how to find pH from $[H^+]$, and how to find pOH from $[OH^-]$.
Ⓢ **CHEM.11D** Perform calculations involving heat, mass, temperature change, and specific heat.	Unit 9	F-3 Specific Heat, Heat of Fusion, and Vaporization	The video is good to understand the definition of the terms that is in the SE 11-D. It is good start to introduce the topic before the actual calculations being taught. The simple calculation is taught.
Ⓢ **CHEM.11D** Perform	Unit 9	F-4 Chilling Water Problem	Shows the further calculation over SE 11-D. The example is helpful to visualize the problem.

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calculations involving heat, mass, temperature change, and specific heat.			
Ⓢ **CHEM.11D** Perform calculations involving heat, mass, temperature change, and specific heat.	Unit 9	F-12 Change of State Example	The example teaches how to solve problem step by step for the SE 11D.
Ⓢ **CHEM.12A** Describe the characteristics of alpha, beta, and gamma radiation.	Unit 3	J-1 Types of Decay	Video defines and describes alpha, beta, and gamma decay and radiation. After defining the three types of decay, video gives and describes examples of balanced nuclear equations for each type.
Ⓡ **CHEM.12B** Describe radioactive decay process in terms of balanced nuclear equations.	Unit 3	J-1 Types of Decay	Video defines and describes alpha, beta, and gamma decay and radiation. After defining the three types of decay, video gives and describes examples of balanced nuclear equations for each type.
		B-1 Orbitals	
		B-2 More on Orbitals and Electron Configuration	
		B-3 Electron Configurations	
		B-4 Electron Configurations 2	
		B-5 Valence Electrons	
		D-1 Molecular and Empirical Formulas	
		D-2 The Mole and Avogadro's Number	
		D-3 Formula from Mass Composition	
		D-4 Another Mass Composition Problem	

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		D-5 Balancing Chemical Equations	
		D-6 Stoichiometry	
		D-7 Stoichiometry: Limiting Reagent	
		D-8 Spectrophotometry Introduction	
		D-9 Spectrophotometry Example	
		E-1 Ideal Gas Equation: PV=nRT	
		E-2 Ideal Gas Equation Example 1	
		E-3 Ideal Gas Equation Example 2	
		E-4 Ideal Gas Equation Example 3	
		E-5 Ideal Gas Equation Example 4	
		G-2 Reactions in Equilibrium	N/A
		G-4 Keq Intuition	N/A
		G-5 Keq Derivation Intuition	N/A
		G-6 Heterogeneous Equilibrium	N/A
		G-7 Le Châtelier's Principle	N/A
		H-1 Acid-Base Introduction	
		H-2 pH, pOH of Strong Acids and Bases	

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		H-3 pH of a Weak Acid	
		H-4 pH of a Weak Base	
		H-5 Conjugate Acids and Bases	
		H-6 pKa and pKb Relationship	
		H-7 Buffers and Henderson-Hasselbalch	
		H-8 Strong Acid Titration	
		H-9 Weak Acid Titration	
		H-10 Half-Equivalence Point	
		H-11 Titration Roundup	
		H-12 Acid-Base Titration	
		I-5 Galvanic Cells	N/A
		J-2 Half-Life	N/A
		J-3 Exponential Decay Formula Proof	N/A
		J-4 Introduction to Exponential Decay	N/A
		J-5 More Exponential Decay Examples	N/A