Table of Content Representation
Topic: Atomic Structure and Bonding

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No	Question	**Big Idea A** **Atom is the smallest particle that consists of three sub-atomic particles**	**Big Idea B** **Ionic bonding are found in compounds that contain metals combined with non-metals**	**Big Idea C** **Covalent bonding invole the sharing of electron that occurs among non-metals**	**Big Idea D** **Metallic bonding is the bonding of electrons that occurs among metals**
1	What you intended the students to learn about this idea	- There are three sub-atomic particles inside atoms which are protons, neutrons and electrons. - Atom has three basics properties which are atomic number, atomic mass and isotopes	- Valence electron is an outer shell electron that is associated with an atom. - Electrons configuration is the distribution of electrons of an atom. - Formation of ionic bonding occurred	- Valence electron is an outer shell electron that is associated with an atom. - Electrons configuration is the distribution of electrons of an atom. - Formation of covalent bonding occurred by sharing	- Valence electron is an outer shell electron that is associated with an atom. - Electrons configuration is the distribution of electrons of an atom. - Formation of metallic bonding occurred when

			by electron loss and gain - Ionic structures are solid at room temperature and have high boiling and melting point. The ions are package together in a regular arrangement called Lattice. - Some properties of ionic compounds are usually hard substances, cannot conduct electricity in a solid state, only conduct electricity in an aqueous and molten state, and dissolve in water.	the electrons in their outer energy levels - Covalent structures are having simple or giant molecular. - Some properties of covalent compounds show the low melting and boiling point, do not conduct the electricity when molten or dissolved in water. - The examples of covalent bonding is Methane	negatively charged electron attract all positive metal ion and bond them together with strong electrostatic force of attraction as a single unit. - Some properties of metal are having high melting and boiling points, high densities, conduct the electricity, malleable and ductile. - The examples of metallic bonding is Iron.

			- The examples of ionic bonding is Sodium Chloride.		
2	Why it is important for students to know this	- The basic materials to learn the next chapter - The basic knowledge about what the things around us made from.	- The basic materials to learn the next chapter - As an essential concept for understanding the chemistry	- The basic materials to learn the next chapter - As an essential concept for understanding the chemistry	- The basic materials to learn the next chapter - As an essential concept for understanding the chemistry
3	What else you know about this idea that you don't intended students to know yet	- Nuclear force - Electrons excitation - Other types of isotopes (ex. isobar and isotones) - All theories of atom	- Explain to students about the formation of the ionic bonding with poliatomic ions arrangements - All theories of atom development that were presented by Niels Bohr, Albert Einstein, Henry Moseley,	- Types of covalent bonding based on the number of bondings (example: single, double or triple bonding) - Types of covalent bonding based on the polarity level (example polar or non polar bonding)	- Explain deeply and clearly about the structure of metallic bonding - All theories of atom development that were presented by Niels Bohr, Albert Einstein, Henry Moseley, Joseph Thomson, Ernest Rutherford,

		development that were presented by Niels Bohr, Albert Einstein, Henry Moseley, Joseph Thomson, Ernest Rutherford, and James Chadwick	Joseph Thomson, Ernest Rutherford, and James Chadwick	- Explain to students about the coordination covalent bonding - All theories of atom development that were presented by Niels Bohr, Albert Einstein, Henry Moseley, Joseph Thomson, Ernest Rutherford, and James Chadwick	and James Chadwick
4	Difficulties/limitations connected with teaching this idea	-	- Visualize the bonding models (abstract concept), to make it contrast with other types of bonding	- Visualize the bonding models (abstract concept), to make it contrast with other types of bonding	- Visualize the bonding models (abstract concept), to make it contrast with other types of bonding
5	Knowledge about students' thinking which	- Atoms shape is like a circle	-	-	- Students might think that there is no bonding at all

	influences your teaching of this idea	- Atoms have a color			exists in metals as they only knew about two separate categories which are ionic and covalent bonding.
6	Other factors that influences your teaching of this idea	- Nutt advertisement about atom that is like a nutt in shape - Over-simplified or even wrong model used in some textbooks	- Over-simplified or even wrong model used in some textbooks - The characteristic of topic that is inherent complexity	- Over-simplified or even wrong model used in some textbooks - The characteristic of topic that is inherent complexity	- Over-simplified or even wrong model used in some textbooks - The characteristic of topic that is inherent complexity
7	Teaching procedures (and particular reasons for using these to engage with this idea)	- Asking students about what the things around us made from. - Introduce the atom exists in our	- Introduce students to valence electrons and also electrons configuration by drawing it. - Playing game of PhET about valence	- Introduce students to valence electrons and also electrons configuration by drawing it. - Playing game of PhET about valence and	- Introduce students to valence electrons and also electrons configuration by drawing it. - Playing game of PhET about valence

		daily live using the video. - Introduce the term of atom by expressing the definition and giving them example of it with the help of PhET simulation. - After understanding the atom, students are asked to make poster representing the atom and particles inside it.	and electrons configuration for further understanding - Showing a video about the formation of ionic bonding - Students are asked to explain what's in the video by their own words - Teacher clarify the students answer and lead them to disscuss about its properties. - Students are asked to make a concept map related to the ionic bonding topic.	electrons configuration for further understanding - Showing a video about the formation of covalent bonding - Students are asked to explain what's in the video by their own words - Teacher clarify the students answer and lead them to disscuss about its properties. - Students are asked to make a concept map related to the covalent bonding topic.	and electrons configuration for further understanding - Showing a video about the formation of matallic bonding - Students are asked to explain what's in the video by their own words - Teacher clarify the students answer and lead them to disscuss about its properties. - Students are asked to make a concept map related to the metallic bonding topic.
8	Specific way of ascertaining students' understanding or	- Asking all students to ask the questions about	- Asking students to explain the formation of ionic	- Asking students to explain the formation of	- Asking students to explain the formation of

	confusion around this idea (include likely range of response)	what students didn't unserstand about atom - Asking smart students to re-explain what the atom is - Askig students to mention the particles inside atom with its characteristics	bonding based on the video they have watched.	covalent bonding based on the video they have watched. - Asking students to differentiate between ionic and covalent bonding	metallic bonding based on the video they have watched. - Asking students to differentiate between ionic, covalent and metallic onding
9	The use of technology in teaching idea	PhET simulation of 'Build an Atom'	- Game in PhET simulation - Video about Ionic Bonding	- Game in PhET simulation - Video about Covalent Bonding	- Game in PhET simulation - Video about Metallic Bonding
10	How to compensate the absence of technology	Hands-on activity to draw the atom model	Hands-on activity using atom model - Students re asked to fill the	Hands-on activity using atom model - Students re asked to fill the Worksheet	Explain the Metallic Bonding by using a poster - Students re asked to fill the

			Worksheet about Ionic Bonding	about Covalent Bonding	Worksheet about Metallic Bonding