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## Chemical bonding worksheet for middle school

Lessons Teacher Background Student Reads Student Reading for Chapter 4 Standards Adjustment Test Bank Questions Example Multimedia This is a review activity for Ionic Bonding. PowerPoint should be used as an exps over. Students receive a dating card each that provides an element and some information about them. Students need ... Ions; ionic binding; electron configuration; binding; auditing tools; handout; Handout. Can be used for review; homework etc my class got ionic binding by playing the domino cards printed from ppt Worksheet for Ionic and Kovalent binding which are differentiated. These are guided- so the circles are already drawn for you/them. There are also long answer questions that are messy between ... everything is attached hope people find it useful :) This PowerPoint is useful to introduce ideas on how atoms bond to form compounds. Stretches more able at Elementary and simple introductory exercise in high school. Visually based presentation that relates the properties of ionic; molecular & giant covalent and metallic substances to their particle arrangements. Summary at the end, I have designed this handout as part of a one-lesson introduction to covalent bonding for my 8th grade class. It consists of a fill gap followed by questions that ask students to draw the dot and ... In this activity students take the role of elements and perform a speed dating activity to find the perfect partner to connect with. For full information on how to carry out the business please... each student has a card. few students in pairs and face each other. they take turns asking the question and the other student to answer it. After 1 min or so make a student move along to ... Do you think that certain groups like black Americans coming out in such high numbers for Biden will affect the outcome of the election? Use this news lesson to support the classroom discussion of why the 2020 election is both a historic and contentious choice. Why has the Trump campaign initiated various lawsuits against states in recent days? Do you think Trump should proceed with the lawsuits? How do detroit area and mail-in polls help the Democratic Party? Why do you think Michigan switched from red to blue? I recently used Tracy's Bonding Basics 2010 Activity (link) with my 6th graders as a guided lesson. We spent a day at Ionic Bonds, and the second day at Covalent Bonds. The students worked in pairs and practiced making Lewis Structures, finding oxidation numbers, identifying elements like either metals or non-metals, and deciding what each element would do when gluing with another element. Instead of candy, I used pennies as electrons along with the element cut outs she gives on her website. This was a great practical activity to get students to see how the atoms bond together, and after a few photos, they were able to quickly determine how each element would bond. Resources: & Covalent Bonding: Google Slides (Public link) Handout – Jag &rade &rade for use with my students (link) Tracy's lesson plan for this activity (link) Tutorial on Lewis Structures video: Case #1225: Christmas Cookie Mystery Christmas Chromatography - Deck Halls with Science Adopt-A-Element Atoms Family Element Trading Cards Periodic Table Basics Building Blocks of Matter - Lego Lesson Bonding Basics Bond with a Classmate Balancing Act - Balancing Equations Chemical Reactions Playing With Polymers Amazing Marshmallows - Boyle's Law Bursting Balloons - Charles Law Tasty Solution Messing With Blends Also Check ... Metric Mania - an assortment of lessons and links for the metric system! Also available ... Lesson Plan Links for Chemistry - Links to my favorite online resources for lesson plans, activities, and spreadsheets. Note For teachers: Take the time to preview the links on any Internet task before using it with your students. With the ever-changing nature of the internet, the links can become broken or websites are no longer available. If you find a problem, please let me know using the Contact form. | Back to the top | Case #1225: Case of the Christmas Cookie Mystery (T.Tomm, Havana Junior High, Havana, IL) Targeted concepts: Chemical & physical properties, chemical reactions, scientific process skills, lab safety, common compounds/uses Try this mystery powder unit with a cool holiday twist! For this lesson, students use their investigative powers to test six samples as well as mystery samples to help Mrs Claus save Christmas. Complete details and student spreadsheets can be found in the PDF version! Lesson Resources: Cookie Mystery (pdf) - Student worksheet containing security rules and data diagrams for initial and final testing Cookie Mystery Final Report Form - Set up with 4 forms per page; used to submit final results from each of the clean laws. Click here for the reindeer team labels I use to label bathtub supplies for this business. Cookie Mystery Class Notes (PPT) – I use this throughout the business to guide students through the safety rules and testing procedures. Cookie Mystery Teacher Directions (pdf) – Information for teachers conducting this lesson Also check out these resources: Everyday Chemistry Scavenger Hunt (pdf) – Students learn the science behind their favorite food and kitchen hacks as they complete this lesson using the websites listed on the chemistry page of the Kid Zone in the far right column. I use this activity before the Christmas cookie mystery. Students will make references to the lesson when discussing the cookie mystery. Scientific Snacks – I use this spreadsheet for students on special days (for example, the day before a break) where they are allowed to bring in snacks and drinks. Students spend some time at the beginning of the class sharing the science behind their favorite treats with their tablemates. Links can be found on the Chemistry page in kid zone in the far right column. | to the top | Christmas chromatography - Deck halls with science science Tomm, Havana Junior High, Havana, IL) Targeted concepts: Chemical & physical properties, solutions (solvents, solutes), paper chromatography Explore chromatography with your students by making a string of light bulbs! Students cut bulb shapes of coffee filters or filter paper and use water-soluble markers, pipe cleaners and water to create a colorful display. String the bulbs on a piece of black yarn to decorate your hallway or classroom. I have also created a little melody for Deck the Hall's melody! Complete details, a copy of the song and light bulb patterns are available in the download. NOTE: I'm doing my chemistry unit before the Christmas break. You can customize this idea to create Easter eggs, flowers, rainbows, or other objects depending on the time of year. Lesson Resources: Deck Halls (pdf) | Back to the top | Adopt-An-Element - One of the favorite projects of the year! (T. Tomm, Havana Junior High, Havana, IL) Targeted Concepts: Atoms, elements, atomic structure, periodic trends, periodic properties, elements/compound uses This project requires students to research an element, create an ad, and complete an element fact sheet. They can use the Internet (see Chemistry links on kid zone), CD-ROM,s, encyclopedias, science books, or other reference sources. The advertisement is used to create a large periodic register on a wall outside my classroom. The ad must be colorful, stylish, and contain the necessary information - atomic number, atomic mass, symbol, element name, advertising slogan and cost. Students must create a slogan related to their element's uses. Images related to the advertising slogan must be included. Ads can be made on a computer or hand written/drawn. The fact sheet must be neat, written in blue/black ink, and contain all the information requested. Students are required to provide a list of sources (at least three) on the back of the fact sheet. NOTE: For pricing information, visit Chemicoool and Los Alamos websites! I have also listed other periodic sites for this project on the chemistry links page of kid zone. Lesson Resources: Adopt-An-Element Project (pdf) - includes all worksheets for this lesson Other Ideas... Adopt-An-Element Baby Book - Check out this neat project idea that Lisa Curry contributed! Students adopt an element and create a baby book that details facts about the element and other information. Adopt-An-Element Online- Thanks to Loyl Perry for sharing his students' Adopt-An-Element project! Check out wearable science projects on ScienceWear.net - Aprons, shirts or labcoats with an elemental theme as well as options for astronomy, biology and more! Thanks to Jody Hodges for developing this great project! Students use permanent markers or fabric paint to create their own atomic attire by coloring the letters and adding diagrams of cells. Visit her website on Facebook for more information and pictures on Projects! Challenge your students with: Periodic table jokes (pdf) Periodic table games 2 (pdf) Periodic table jokes - Answer key (pdf) Tips for Elements (pdf) | Back to the top | Atoms Family (Lesson created by Kathleen Crawford, 1994) Targeted Concepts: Atoms, Elements, Subatomic Particles, Atomic Structure I use this lesson to introduce fifth graders in my school to the basics of atomic structure. Members of the Atoms family correspond to protons, neutrons and electrons to help students remember their charges and locations in an atom. In addition, students learn the basics of electron configuration with a tour of Matterville. At the end of the lesson, students song the Atoms Family song to the tune of the Adams family. Lesson Resources: Atoms Family Worksheets (pdf) - Includes the student's worksheet and answer keys. Atoms Family PowerPoint – I developed this presentation to use when I teach the lesson to our fifth grade students. Students fill out the Atoms Family spreadsheet as we discuss the presentation and then practice singing the song. The last three images are related to the Atomic Math Challenge which I use with the lesson. Atoms Family Atomic Math Challenge (pdf) - Students determine the number of protons, neutrons and electrons for each element. | Back to the top | Element Trading Cards (T. Tomm, Havana Junior High, Havana, IL) Targeted concepts: Atoms, elements, atomic structure, periodic trends, periodic properties, elements/compound uses I created this project for fifth grade students in my school. After completing the Atoms Family lesson and atomic math challenge, students use their knowledge of the elements to create trading cards. Students are also challenged to find images illustrating the different uses of the elements. The PDF download includes project instructions and templates for the cards. The templates may be copied on cover layers or glued to 3x 5 index cards. Our students create cards for 5 elements. The worksheet provided does not contain such a requirement to change the project to your classroom. Lesson Resources: Element Trading Cards (pdf) | Back to the top | Periodic Table Basics (T. Tomm, Havana Junior High, Havana, IL) Targeted concepts: Atoms, elements, atomic structure, classes of elements, element families/groups, periodic table, periodic trends, periodic characteristics, elements/compound uses I developed this lesson to build on the Atomic Math Challenge (pdf) (see above) and allow my students to explore the periodic characteristics of the periodic table of elements. Students complete fact cards on the first 18 elements. They use Internet sites or printed resources to find basic information (atomic number, atomic mass, and phase), melting and boiling points, physical and chemical properties, and common uses as well as drawing Bohr charts and Lewis for each element. Students also color code the fact shortly before cutting them apart and arranging according to atomic number. Atomic. students have created a mini periodic table on a large sheet of construction paper, they use the information they have collected to answer questions related to periods, families and properties. There are two versions available. Version 1 contains atomic numbers, atomic mass, number of subatomic particles, Bohr diagrams and Lewis Structure. Version 2 is the one I use with my 8th grade students and covers all items in version 1 as well as phase (solid, liquid, gas), melting/boiling points, discovery information, properties, and common uses. NOTE: I have listed the periodic table sites for this project on the chemistry links page of kid zone. Lesson Resources: Also available... Atomic Basics (pdf) – I use this spreadsheet before starting the Periodic Table Basics task to review how to determine the number of protons, neutrons and electrons as well as introduce Bohr diagrams and Lewis structures. A PowerPoint is also available for this lesson. Atomic Changes (pdf) - What happens to an atom when you add or remove protons, electrons or neutrons? Use this worksheet to explore your changes with your students. Element Jeopardy (PPT) - A PowerPoint game that reviews element names/symbols, periodic table families, oxidation numbers, and common compounds. Challenge your students with the Periodic Crossword Table (pdf) | Back to the top | Building Blocks of Matter – Lego Lesson (Tracy Tomm & Lindsay Bogner, Havana Junior High, Havana, IL) Targeted concepts: Atoms, elements, compounds, mixtures, coefficients, subscripts During this lesson students use Legos to model elements, compounds and blends to better understand the differences between them. They learn what coefficients and subscripts represent as the write expressions for each challenge. Download the teacher information page for more details. A PPT is also available. Lesson resources: Teacher information (pdf) with student worksheets, PowerPoint presentation | Back to the top | Bonding Basics (Tracy Tomm & Lindsay Bogner, Havana Junior High, Havana, IL) Targeted Concepts: Ionic & covalent bonding, atomic structure (oxidation #s, Lewis structures, valence electrons), common compounds/uses My students have difficulty visualizing ionic and covalent bonds. To better help them understand the transfer or sharing of electrons, my student teacher, Lindsay Bogner, and I developed this new version involving the use of atomic headbands and ping pong balls. The students use the ping pong balls as electrons and we show how each type of bond is formed by either transferring ping pong balls from one headband to the other or by splitting ping pong balls between two headbands. Lesson Resources: 2010 Version - Don't you have the time or material to make the headbands? Try this one! For this version I have combined 2002 and 2008 versions into one that uses candy pieces with element labels from headbands. 2002 Version - I this lesson before developing the new version. Version Used Fruity Pebbles (or other small candies or cereals) for electrons - to learn more about the process of transferring electrons for ionic bonding or splitting of electrons for covalent bonding. The PDF download includes the student's worksheet as well as a response key and notes for teachers. Student Spreadsheets: Bonding Basics -Ionic Bonds (pdf), Bonding Basics - Covalent Bonds (pdf), and Bonding Basics Practice Page (pdf) Also available... Candy Compounds (pdf) - For this lesson, students use gumdrops or jellybeans to model molecules and bond structures. Downloading includes teacher notes, student worksheets, and a response key. | Back to the top | Bond with a classmate (Gail Sanders, Monroe Middle School, Wheaton, IL) Targeted concepts: Ionic bonding, oxidation numbers, common compounds (naming, chemical formula, uses) In this activity from Gail Sanders, a member of the MidLevel Science Teachers group in Northern Illinois students are given a tag (or necklace) to wear with the symbol of an ion and its oxidation number. Positive ions are green and the negative ions are blue. The students are instructed to bond with other ions and keep a record of their ties. Students had to work with their bonding partner to agree on and write a formula and name for the association they formed. Once it was done, they were able to break the ribbon and find another ion set to bind. After 5 bonds, students exchange tags with another student and start bonding again. Lesson resources: Bond with a classmate Short (pdf) and Bond with a Classmate spreadsheet (pdf) | Back to the top | Balancing Act (T. Tomm, Havana Junior High, Havana, IL) Targeted concepts: Chemical reactions, balancing chemical equations, and preservation of mass During this introductory lesson, students learn the concepts behind balancing chemical equations. I instruct my students to make a list of atoms on each side of the equation to help them keep track of their progress. When they add coefficients, they increase the number of these atoms in their lists. Students can easily see if they have balanced each equation. Lesson Resources: Snowman Challenge Game - Challenge your students to a game of balancing equations! Print snowman cards and problems. Cut them apart and hide in your classroom. Have the kids work in pairs to find problems and solve them. Rules and directions are printed on the top of the student worksheet. I cross away the problems as they are solved to keep track of the number of problems that are still hidden when playing the game. Student Spreadsheets - Snowman Challenge Spreadsheets & Answers Key (pdf) Snowman Cards - Front of cards - Snowman Cards (pdf) and Back of cards - Snowman Card Problems (pdf) Equation Challenge Game - An updated version of the Snowman Challenge Game, which contains new questions in addition to the equations from the original challenge for a total of 60 problems. I printed out and placed each in an Easter egg, which I hid in different different around my classroom. I have the kids work in pairs to find problems and solve them. Rules and directions are printed on the top of the student worksheet. Worksheet - Equation Challenge Worksheet (pdf), Equation Challenge Card (pdf), and Equation Challenge Answer Key (pdf) Do you want more equations to balance? Visit these links... • ChemBalancer\* - Challenge your students to this interactive game about balancing equations. Visit the Fun Based Learning website for spreadsheets and other chemistry games. • GenChem - Balancing Equations Tutorial\* - An excellent interactive lesson to use with your students! The site also provides online practice problems! \* - Indicates a link on the Chemistry links page on Kid Zone. Thanks to Kari Pate for sharing her I Spy An Element game, which was created after she used the Snowman Challenge. For this challenge, students must find elements that match the clues on the different cards. She used pumpkins to decorate the back of her cards. | Back to the top | Chemical Reactions (T. Tomm, Havana Junior High, Havana, IL) Targeted Concepts: Chemical Reactions, Preservation of Mass My Students Have Difficulty Identifying the Different Types of Chemical Reactions. I use this worksheet after we have already discussed balancing equations to explore the differences between synthesis, degradation, simple replacement, and double replacement reactions. Students watch a film about chemical reactions and then use colored pencils to help them determine what happens during the reaction. Teacher notes have been provided along with the student worksheet and answer key. Discovery Education subscribers: The video is available on their streaming site under the name Physical Science Series: Chemical Reactions. Lesson Resources: | Back to the top | Playing with Polymers (T. Tomm, Havana Junior High, Havana, IL) Targeted concepts: Polymers, physical/chemical properties & changes, science process skills (observation, analysis, etc.), lab procedures & safety Explore the world of polymer chemistry with your students! My students loved learning about polymers and playing with their

mucus during a unit on petrochemicals. After students make a batch of mucus, they do a variety of tests and write their data/observations in a chart. After everyone has had a chance to test slimes, I give 3 samples of mystery slimes. Students do the tests with mystery slimes to determine which ingredients were used to make each one. Download the recipes and teacher notes for more details! Lesson Resources: Playing with Polymer Teacher Notes (pdf) - This download provides an overview of your device, schedule, material list, preparation instructions, and tips to get the most out of your slime time. Polymer unit student package (pdf) – Includes note worksheets, puzzle pages, data charts and mucus test descriptions. Participants fill in the note proposal using the information on the slides in the presentation and complete the data chart when they slime experiments. I demand that students complete the puzzle pages in their own time. To play with Polymers PPT - PowerPoint presentation that contains the information on the student note pages, link to the movie and safety rules, and directions for each of the slim tests on the recipe page listed below. Playing with polymer recipe card (pdf) – I print enough recipe cards to provide 2 copies for each group of 4 students. If possible, laminate the cards to help them keep from year to year. Polymer Basics Internet Scavenger Hunt (pdf) - Uses websites on the chemistry links page of kid zone. Visit hands-on plastics website to order free kits and view other great training materials! The kit provides several different types of plastic and great lesson ideas that I used to integrate the world of plastic into the Playing with Polymers unit! Want more information about mucus? Visit these sites for information, recipes, and lesson ideas... Polymer Ambassadors – Explore their great ideas to incorporate polymers into your science curriculum. Polymer Project - Information and recipes for a variety of slimes! A bag of slime - Information about non-Newtonian liquids and recipes for mucus. JLab Obleck - A polymer version of Obleck with several ready-to-use spreadsheets to challenge your students. | Back to the top | Amazing Marshmallow's Lab (Boyle's Law) (T. Tomm, Havana Junior High, Havana, IL) Targeted concepts: Boyle's Law, Phases of Matter, Physical Characteristics NOTE: A spreadsheet that combines Boyle's Law and Charles's Law is available – Gas Laws Lab (pdf) Material: Syringe & fresh marshmallows Procedure: To demonstrate Boyle's Law, give students a syringe and 3 small marshmallows. Instruct them to place the marshmallows in the syringe and replace the plunger. Push the plunger as far down as possible without mashing the marshmallows. Place a finger on the syringe end and pull out the plunger to the end of the syringe. Note marshmallows. Students will notice that they are getting bigger, or expanding. When the plunger is pulled out, the volume of air inside the syringe causes a pressure drop. This can be seen by the expansion of the marshmallow. Next leave the plunger at the end of the syringe and place a finger on the other end. Push the plunger into the syringe and observe the marshmallows. Students will notice that they are shrinking. When the plunger is pushed into the syringe, the volume of air inside the syringe decreases, causing an increase in pressure. This can be seen by compression, or shrinkage, of the marshmallows. | Back to the top | Bursting Balloons (Charles' Law) - Best done on a cold day! (T. Trimpe) Tomm, Havana Junior High, Havana, IL) Targeted concepts: Charles' Law, phases of matter, physical properties Material: Helium balloons (mylar type) & tissue strips Procedure: To show Charles' Law, get two helium balloons of about the same size. Cut tissue paper into strips and wrap around each balloon. Place a balloon in a warm place, for example, in a car on a hot day or near a heater. Leave it alone for several minutes. Students should be able to observe the balloon increasing in size (or volume). If you're lucky, the soda paper will tear! As the gas temperature increases, the volume also increases as the gas expands. A good reason not to leave helium balloons inside a car on a hot day! Place the second balloon in a cold place, out on a winter day or in a freezer. Leave it alone for several minutes. Students should be able to observe that the tissue becomes loose on the balloon - it can even fall off or slip off easily. When the gas temperature decreases, the volume also decreases. Many places that sell helium balloons in winter time will warn you that your balloons may shrink when they are in the cold, but will return to normal size once they are back at room temperature. Charles' Law should help explain this phenomenon. | Back to the top | Tasty Solution (T. Tomm, Havana Junior High, Havana, IL) Targeted concepts: Solutions (incl. solvents, solutes), blends, physical properties, data analysis During a lesson on blends and solutions, my students compare the dissolution time of a piece of candy in different situations. When they're done, they use the data to create a graph and answer some questions related to solutions. Student Worksheet: Tasty Solution (pdf) | Back to the top | Messing With Mixtures (T. Tomm, Havana Junior High, Havana, IL) Targeted concepts: Mixtures, physical properties, data analysis This lab project enables students to investigate the differences between mixtures, colloids and solutions! Download the lesson calculations and lab notes for more details. NOTE: This lab contains the Tasty Solution lesson described above. Lesson Worksheet: Messing With Mixtures Lab Spreadsheets (pdf) and Messing With Blends Lab Notes (pdf) Extension Idea: Use sharpie markers and rub alcohol to make a cool tie-dye t-shirt project that would be a hit for any unit on solutions and blends! Visit the Steve Spangler tie-dye website and scroll down the page for directions! Directions!

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