Unit 2: Smells: Molecular Structure and Properties

Chemistry | **13 Days**

Topics from the NYC Scope and Sequence	Periodic Table Physical Behavior of Matter Chemical Bonding Organic Chemistry	**New York State Core Curriculum Alignment**	Periodic Table: 3.1aa, 3.1bb Physical Behavior of Matter: 3.1nn, 5.2m, 5.2n Chemical Bonding: 5.2g, 5.2a, 5.2e, 5.2l, 5.2n, 5.2d, 5.2j, 5.2k, 5.2h Organic chemistry: 3.1ff, 3.1gg, 3.1hh, 3.1ii

Pacing Guide (*This guide is based on 50-minute lesson length)*

Day	Living by Chemistry Lesson Title	Additional Resource
1	**2.1 - Sniffing Around: Molecular Formulas** ● *Hard to find pineapple extract in the stores and should be ordered on amazon in advance as well as any other extracts you might have a hard time finding*	
2	**2.2 - Molecules in 2 Dimensions: Structural Formulas**	
3	**2.3 - Honc if You Like Molecules: Bonding Tendencies** ● *Students should be able to recognize isomers for the regents but you do not need to focus on making sure they can draw every type of isomer for a given molecular formula*	
4	**2.4 - Connect the dots: Lewis dot symbols** ● *Regents does not test the difference between a lone pair and a bonded pair* ● *Regents alignment addition: Teach about ionic lewis dot structures and how to draw them*	Lewis dot puzzle pieces ● Cannot run on an ipad. Only works on computers.
5	**2.5 - Eight is Enough: Octet Rule** ● *Introduce organic chemistry at the end of this lesson since the next lesson discusses functional groups*	Lewis dot puzzle pieces ● Cannot run on an ipad. Only works on computers.
6	**Intro to Organic Chemistry topics include:** ● *Organic chemistry is the study of carbon, define difference between a saturated and unsaturated hydrocarbon, isomers, define alkane, alkene, and alkyne (see table Q on the reference sheet)*	
7	**Phet simulation lab: Build a Molecule** ● *This lab simulations reviews the concepts students have practiced in lessons 1-5*	Phet Simulation Lab Sheet ● Modified from phet website

7-8	**2.6.- Where is the Fun: Functional Groups** ● *Students should focus on reference table R when learning about functional groups* ● *This lesson only covers: Organic Acids, Esters, Alkanes, Ketones, and Amines* ● *The rest of the functional groups listed on table R will need to be covered at some point during the year. You can cover them all now or wait until the end of the year to finish them if you think it will be too overwhelming for the students.* ● *Cover Table P & Q at this point= drawing hydrocarbons*	Intro Video
	We suggest you skip the following lessons from Living by Chemistry because they are not necessary for Regents preparation. ● *2.7 Create a Smell: Ester Synthesis* ● *2.8 Making Scents: Analyzing Ester Synthesis* ● *2.9 New Smells: New Ideas: Ball and Stick Models* ● *2.10 Two's Company: Electron Domains* ● *2.11 Let's Build it: Molecular Shape* ● *2.12 What Shape Is That Smell?:Space-Filling Models* ● *2.12 Sorting It Out: Shape and Smell* ● *2.14 How Does the Nose Know?: Receptor Site Theory*	
9	**2.15- Attractive Molecules: Attractions Between Molecules** ● *Will need to add in the types of intermolecular forces covered on the regent* ○ *Hydrogen bonding, molecular ion attraction, hydrated ions.* ○ *Be sure to discuss what ionic character means*	intro polarity video
10	**2.16- Polar Bears and Penguins: Electronegativity and Polarity** ● *As an extension have students create their own comics using polar bears and penguins to depict the polarity of different molecules (see linked example)* ○ *Switch up the molecules to make the activity more challenging* ○ *Only assign the assignment after you teach lesson 17 so that students can add their understanding of electronegativity to the project*	Example comic activity sheet
11	**2. 17 Thinking (Electro)Negatively: Electronegativity Scale**	
12	**Phet simulation: Polarity** ● *Spend a day doing this simulation lab activity to review polarity and electronegativity*	Polarity Phet Simulation Lab Sheets

	We suggest you skip the following lessons from Living by Chemistry because they are not necessary for Regents preparation. ● *2.18 I Can Relate Polar Molecules and Smell* ● *2.19 Sniffing It Out: Phase, Size, Polarity, and Smell* ● *2.20- Mirror, Mirror: Mirror-Image Isomers* ○ *Students should understand what isomers are (see lesson 5: intro to organic chemistry)* ○ *They do not need to know superimposable isomers or mirror images for the regents* ● *2.21- Protein Origami: Amino Acids and Proteins* ○ *Students need to know what an amino acid is for the regent(which you may want to cover in lesson 7: Functional groups). The rest of this material is not regent aligned.*	
13	**Who Nose: Unit Review** ● *Half of unit 2 is not regents aligned so the unit review may not be so helpful and you will want to come up with another unit review activity*	