Electronic Supplementary Material (ESI) for Chemistry Education Research and Practice. This journal is © The Royal Society of Chemistry 2017

## Appendix 1

## **SALG Baseline Survey**

## **Instructions to students:**

Teachers value students' feedback and take it into account when improving their courses. Please be as precise as you can in your answers. Please choose "not applicable" for any activity you did not do. You may find one or more questions at the end of each section that invite an answer in your own words. Please comment candidly, bearing in mind that future students will benefit from your thoughtfulness. Remember that this is an anonymous survey: your teacher will never know what any individual student has written.

## Understanding

<ol> <li>Presently, I understand</li> <li>the following concepts that will be explored in organic chemistry:</li> </ol>	not applicable	not at all	just a little	somewha	t a lot	a great deal
1.1.1 how to use the Periodic Table		$\bigcirc$			0	
1.1.2 how to draw Lewis Dot structures	0	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	
1.1.3 how to assign formal charge	0	$\bigcirc$	$\bigcirc$	$\bigcirc$	0	
1.1.4 how to predict 3-D shapes and polarity of molecules	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	
1.1.5 orbitals, including atomic, hybrid and molecular	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	
1.1.6 how to name alkanes, alkenes, alcohols, alkyl halides, ethers, thiols, epoxides, and enantiomers by the IUPAC system	0	0	0	0	0	$\bigcirc$
1.1.7 how to identify all the functional groups present in a given organic chemical	$\circ$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	
1.1.8 how to propose and predict the outcome of acid-base reactions	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	
1.1.9 how IR, NMR, and mass spectroscopy work & how I can use each kind of spectrum to identify structural facets of an unknown molecule	0	0	0	0	0	$\bigcirc$
1.1.10 how to recognize the difference between conformations, consitutional isomers, and configurational isomers, including enantiomers	0	0	0	0	0	0
1.1.11 how to identify chiral molecules	$\bigcirc$	$\bigcirc$		$\bigcirc$	$\bigcirc$	
1.1.12 how to draw the stereoisomers of chiral compounds	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	
1.1.13 how to indentify the stereochemical relationship between structures	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	

1.1.14 how to explain the mechanisms of uni- and bimolecular substitutions and eliminations	$\circ$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\circ$	0
1.1.15 how to identify nucleophiles and electrophiles and predict reactions between them	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
1.1.16 how to write a proper reaction mechanism for a given reaction with known products	$\circ$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
1.1.17 how to write mechanisms to predict outcomes for a half dozen types of addition reactions	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\circ$	0	0
1.1.18 how to determine whether or not a reactive intermediate will rearrange its internal structure prior to further reaction	$\circ$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
1.1.19 how to recognize when resonance exists in a given structure	$\bigcirc$	$\bigcirc$	$\bigcirc$	0	$\bigcirc$	0
1.1.20 how to use resonance, when it is present, to predict the reactivity of a given compound	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
1.2 (I can explain) the relationships between the main concepts listed above (1.1.1-1.1.20)	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
1.3 (I can) list several common synthesis methods for, as well as several common	not applicable	not at	just a little	somewhat	a lot a gr	
reactions of		all	nttie		de	aı
	0			0		
reactions of	0			0	() ()	
reactions of 1.3.1 alkyl halides	0	0 0	0	000	() ()	
reactions of 1.3.1 alkyl halides 1.3.2 alkenes	0	0 0 0		0000	0 0 0	0000
reactions of 1.3.1 alkyl halides 1.3.2 alkenes 1.3.3 alkynes	0 0 0 0			00000		00000
reactions of 1.3.1 alkyl halides 1.3.2 alkenes 1.3.3 alkynes 1.3.4 alcohols	0 0 0 0 0			000000		000000
reactions of 1.3.1 alkyl halides 1.3.2 alkenes 1.3.3 alkynes 1.3.4 alcohols 1.3.5 thiols	000000			0000000		0000000
reactions of  1.3.1 alkyl halides  1.3.2 alkenes  1.3.3 alkynes  1.3.4 alcohols  1.3.5 thiols  1.3.6 ketones and aldehydes	0000000			00000000		00000000
reactions of  1.3.1 alkyl halides  1.3.2 alkenes  1.3.3 alkynes  1.3.4 alcohols  1.3.5 thiols  1.3.6 ketones and aldehydes  1.3.7 carboxylic acids and their derivatives	00000000			000000000		
reactions of  1.3.1 alkyl halides  1.3.2 alkenes  1.3.3 alkynes  1.3.4 alcohols  1.3.5 thiols  1.3.6 ketones and aldehydes  1.3.7 carboxylic acids and their derivatives  1.3.8 ethers	00000000			0000000000		0000000000
reactions of  1.3.1 alkyl halides  1.3.2 alkenes  1.3.3 alkynes  1.3.4 alcohols  1.3.5 thiols  1.3.6 ketones and aldehydes  1.3.7 carboxylic acids and their derivatives  1.3.8 ethers  1.3.9 epoxides  1.4 how to plan workable multi-step sequences of reactions that convert simple starting compounds into complex organic products using my knowledge of	000000000		000000000000000000000000000000000000000	0000000000000		

1.7 how studying organic chemistry helps people address real world issues	0	0	$\bigcirc$	$\bigcirc$	0	0
1.8 What concepts would you like to understand at the end of the course?						
Skills						
2. Presently, I can	not applicable	not at all	just a little	somewha	t a lot	a great deal
2.1 Find published data I need for lab work and report writing	$\bigcirc$	0	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
2.2 Critically evaluate debates in the media about issues related to science involving organic chemistry	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
2.3 Identify patterns in data	0	0	0	$\bigcirc$	$\bigcirc$	
2.4 Recognize a sound argument and appropriate use of evidence	0	0	0	0	0	0
2.5 Write documents in the style and format appropriate for chemists	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
2.6 behave as an effective team member	$\circ$	0	0	0		
2.7 behave as an effective leader	0	0	0	0	0	0
2.8 interact productively to solve problems with a diverse group of classmates	0	0	0	0	0	0
2.9 analyze chemical models and draw appropriate conclusions	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
2.10 develop testable hypotheses		0	$\bigcirc$	$\bigcirc$	0	
2.11 design and execute experiments	$\bigcirc$	0		$\bigcirc$	$\bigcirc$	
2.12 What skills would you like to gain or improve upon during this course?						
Attitudes						
3. Presently, I am	not applicable	not at all	just a little	somewha	t a lot	a great deal
3.1 Enthusiastic about learning organic chemistry	$\bigcirc$			$\bigcirc$	$\bigcirc$	
3.2 Interested in discussing topics related to organic chemistry with friends or family	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$		
3.3 Confident that I will understand and						

succeed at organic chemistry 3.4 Comfortable working with complex		_	_			_
ideas	$\circ$		$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
3.5 Willing to seek help from others (teacher, peers, TA) when working on academic problems	0	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
3.6 What are your reasons for taking this course?						
3.7 Please comment on your interest level in the subject PRIOR to the beginning of the semester.						
3.8 Please comment on your present level of interest in the subject.						
Integration of learning						
						a aroat
4. Presently, I am in the habit of	not applica	ble not at all	just a little	somewh	at a lot	a great deal
<ul><li>4. Presently, I am in the habit of</li><li>4.1 Connecting key ideas and reasoning skills that I learn in my classes with other areas of my life</li></ul>	not applica	nie		somewh	at a lot	-
4.1 Connecting key ideas and reasoning skills that I learn in my classes with other	not applica	nie		somewh	at a lot	-
4.1 Connecting key ideas and reasoning skills that I learn in my classes with other areas of my life 4.2 Using systematic reasoning in my	not applica	nie		somewh:	at a lot	-
<ul> <li>4.1 Connecting key ideas and reasoning skills that I learn in my classes with other areas of my life</li> <li>4.2 Using systematic reasoning in my approach to problems</li> <li>4.3 determining how each piece of new information or knowledge fits into the</li> </ul>	not applica	nie		somewh:	at a lot	-
<ul> <li>4.1 Connecting key ideas and reasoning skills that I learn in my classes with other areas of my life</li> <li>4.2 Using systematic reasoning in my approach to problems</li> <li>4.3 determining how each piece of new information or knowledge fits into the pattern of my existing knowledge</li> <li>4.4 critically analyzing data and</li> </ul>	0	nie		somewh:	at a lot	-
4.1 Connecting key ideas and reasoning skills that I learn in my classes with other areas of my life 4.2 Using systematic reasoning in my approach to problems 4.3 determining how each piece of new information or knowledge fits into the pattern of my existing knowledge 4.4 critically analyzing data and arguments before I make an action plan 4.5 Please comment on how you expect the organic chemistry material to integrate	0	nie		somewh:	at a lot	-
4.1 Connecting key ideas and reasoning skills that I learn in my classes with other areas of my life 4.2 Using systematic reasoning in my approach to problems 4.3 determining how each piece of new information or knowledge fits into the pattern of my existing knowledge 4.4 critically analyzing data and arguments before I make an action plan 4.5 Please comment on how you expect the organic chemistry material to integrate with your studies, career, and/or life:	0	nie		0 0 0	at a lot	-
4.1 Connecting key ideas and reasoning skills that I learn in my classes with other areas of my life 4.2 Using systematic reasoning in my approach to problems 4.3 determining how each piece of new information or knowledge fits into the pattern of my existing knowledge 4.4 critically analyzing data and arguments before I make an action plan 4.5 Please comment on how you expect the organic chemistry material to integrate with your studies, career, and/or life:  Future Plans 5. Please characterize your future plans at	0	o all	little	0 0 0	at a lot	-

pharmacy, etc.)					
5.3 I plan to attend graduate school in the natural sciences.	$\bigcirc$	$\bigcirc$			
5.4 I plan to gain employment as an engineer.	$\bigcirc$	$\bigcirc$	$\bigcirc$		
5.5 Please comment on your future plans here, especially if none of the above apply:					
5.6 Have your future plans changed since you entered the university?		$\bigcirc$	$\bigcirc$		