Tools for Mapping Vision and Change Core Concepts and Competencies

The following pages contain tools for mapping the extent to which individual courses in your department's curriculum are currently aligned with the recommendations in the *Vision and Change* report. These tools may be used by individual faculty members at first before the department works together to identify gaps or areas of improvement in the curriculum as a whole. These tools are useful in preliminary preparation for curriculum mapping for the department. They also serve as useful preparation tools prior to using the PULSE Self-Evaluation and Certification Rubrics available at www.pulsecommunity.org.

The tools are the following:

1) Worksheet to list all courses taught by an individual faculty member
2) Worksheet to map Vision and Change Core Concepts within a particular course
3) Worksheet to map Vision and Change Core Competencies applied to Biology practice within a particular course
4) Worksheet to map Vision and Change Core Competencies within a particular course
5) Worksheet to map the use of instructional methods to foster student-centered learning in courses taught by an individual faculty member

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Worksheet 1

List all of the courses that you typically teach at your institution in any given semester (or you may start with the courses that you will teach in the upcoming academic year):

	Catalog Number	Title of the Course	Majors/ Non majors	Team taught/Multiple sections in a semester/ One section	Do you make most of the decisions for the course? Yes/No
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					

Worksheet 2 - Mapping the Extent of Addressing Vision and Change Core Concepts in an Individual Course

Course Number and Title: ____

List 4-5 key learning outcomes or objectives for this course. Indicate if one or more of the V&C Core Concepts are addressed by the learning outcome or objective and to what extent (0=not addressed, 3=addressed to some extent, 5=addressed in depth). *Descriptions of the core concepts are available in the Vision and Change Report. Consulting the BioCore Guide[1], a nationally validated tool for interpreting these core concepts, is helpful for this worksheet.*

Learning outcomes or objectives for this course	Evolution	Structure and Function	Information, Flow, Exchange, and Storage	Pathways and Transformations of Energy and Matter	Systems
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5

[1]Brownell et al. 2014. BioCore Guide: A Tool for Interpreting the Core Concepts of Vision and Change for Biology Majors. CBE-Life Sciences Education, 13: 200-211.

<u>Worksheet 3</u> - Mapping the Extent of Vision and Change Core Competencies in an Individual Course

Course Number and Title: _____

The following are examples of core competencies applied to Biology practice. Indicate to what extent each of these practices are applied in this course. (0=not practiced, 3=practiced to some extent, 5=practiced in depth). *Descriptions of the core competencies are available in the Vision and Change Report.*

Core Competency	**Example of Practice**				
Ability to apply the process of science	*Observational strategies*	*Hypothesis testing*	*Experimental design*	*Evaluation of experimental evidence*	*Developing problem-solving strategies*
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
Ability to use quantitative reasoning	*Developing and interpreting graphs*	*Applying statistical methods to diverse data*	*Mathematical modeling*	*Managing and analyzing large data sets*	
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	
Ability to use modeling and simulation	*Computational modeling of dynamic systems*	*Applying bioinformatics tools*	*Managing and analyzing large data sets*	*Incorporating stochasticity into biological models*	
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	
Ability to tap into the interdisciplinary nature of science	*Applying physical laws to biological dynamics*	*Chemistry of molecules and biological systems*	*Applying imaging technologies*		
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5		
Ability to communicate and collaborate with other disciplines	*Scientific writing*	*Explaining scientific concepts to different audiences*	*Team participation*	*Collaborating across disciplines*	*Cross-cultural awareness*
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
Ability to understand the relationship between science and society	*Evaluating the relevance of social contexts to biological problems*	*Developing biological applications to solve societal problems*	*Evaluating ethical implications of biological research*		
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5		

<u>Worksheet 4</u> - Mapping the Extent of Vision and Change Core Competencies in an Individual Course

Course Number and Title: ____

List 4-5 key learning outcomes or objectives for this course. Indicate if one or more of the Vision and Change Core Competencies are addressed by the learning outcome and to what extent (0=not addressed, 3=addressed to some extent, 5=addressed in depth). *Descriptions of the core competencies are available in the Vision and Change Report.*

Learning outcomes or objectives for this course	**Ability to apply the process of science**	**Ability to use quantitative reasoning**	**Ability to use modeling and simulation**	**Ability to tap into the interdisciplinary nature of science**	**Ability to communicate and collaborate with other disciplines**	**Ability to understand the relationship between science and society**
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5

<u>Worksheet 5</u> - Mapping the Extent of Student-Centered Learning Instructional Practices Used in Your Courses

The following are examples of instructional methods that foster student-centered learning. Indicate to what extent each of these practices are applied in this course. (0=not practiced, 3=practiced a few times, 5=practiced multiple times throughout semester or extensive module). *Descriptions of these practices are available in the Vision and Change Report.*

Course that you teach (Course # and title)	**Authentic research; open-ended; student-designed; research activities**	**Case Studies**	**Classroom assessment and immediate response systems (clickers, "murkiest point", etc)**	**Inquiry-based learning and inquiry-driven learning**	**Team-based learning**	**Model-based learning**
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5