**Biology**

**Primary Source:**

Concept Inventories/Conceptual Assessments in Biology (CABs) website.  
http://go.sdsu.edu/dus/ctl/cabs.aspx

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**MOLECULAR AND CELL BIOLOGY, GENETICS**

**Biology Concept Inventory (BCI)**

Assesses understanding of general biology concepts. Field-tested with introductory major’s biology students.

(30 MC items)


Items provided at:  
http://bioliteracy.colorado.edu/
**Introductory Molecular and Cell Biology Assessment (IMCA)**

Assesses general concepts from molecular and cellular biology. Field-tested with introductory molecular biology majors.

(24 MC items, diagrams)


Items provided at:
http://w.lifescied.org/content/9/4/453.full

**Molecular Life Sciences Concept Inventory (MLS)**

Assesses concepts related to molecular structure, dynamics, and energy.

(26 MC items in trial reported in Wright and Hamilton 2008; 96 MC items addressing 10 “big ideas” in 6 modules on-line, diagrams, scenarios)


Items could not be found.

**Diffusion and Osmosis Diagnostic Test (DODT)**

Assesses concepts related to diffusion and osmosis. Field-tested with secondary students as well as introductory majors and nonmajors biology students.

(12 two-tiered MC items, diagrams)


**Osmosis and diffusion conceptual assessment (ODCA)**

Assesses concepts related to diffusion and osmosis. Field-tested with introductory nonmajors as well as introductory and upper-division biology majors. Includes components of previously published DODT.

(8 two-tiered MC items, diagrams)


Items provided at: http://www.lifescied.org/content/10/4/418.full.pdf+html?with-ds=yes

**Meiosis Concept Inventory (Meiosis CI)**

Assesses understanding of concepts and processes of meiosis. Field-tested with introductory biology and genetics students.

(17 questions, mixed MC, MC select all)


Items available at: http://q4b.biology.ubc.ca

**Genetics Literacy Assessment Instrument (GLAI)**

Assesses assorted concepts in genetics and inheritance. Field-tested with introductory majors and non-majors biology students.

(31 MC items)


Items provided in Moskalik 2007:
https://etd.ohiolink.edu/ap/10?0::NO:10:P10_ACCESSION_NUM:ucin1195583851

**Genetics Concept Assessment (GCA)**

Assesses general concepts in genetics and inheritance. Field-tested with majors and non-majors genetics students.

(25 MC items, diagrams), items NOT provided


Items not provided.

**Genetics Diagnostic Instrument**

Assesses general concepts in genetics and inheritance. Field-tested with upper-level secondary students.

(13 two-tiered MC items, diagrams)


Items provided at:
http://www.tandfonline.com/doi/pdf/10.1080/09500690902951429#.U8w9nrF33QA
**Developmental Biology Content Survey**

Assesses general concepts in developmental biology. Field-tested with upper-division developmental biology students.

(15 MC items)


Items provided at:
http://www.lifescied.org/content/4/4/298

**Host-Pathogen Interactions (HPI)**

Assesses understanding of host-pathogen interactions. Field-tested with introductory, intermediate, and advanced students from a microbiology program.

(17 [18 noted in Marbach-Ad et al. 2009] two-tiered MC items)


Items not provided.

**Breathing and Respiration**

Assesses understanding of breathing, gas exchange, and respiration through a paper-pencil format. Field tested with secondary students.

(12 two-tiered MC items)

Items could not be found.

**Photosynthesis and Respiration**

Assesses understanding of photosynthesis and respiration in plants. Field-tested with secondary students.

(13 two-tiered MC items, plus open ended)


Items could not be found.

**Flowering Plant Growth and Development**

Assesses understanding of flowering plant growth and development. Field-tested with secondary students.

(13 two-tiered MC items)


Items provided at:
www.lifescied.org/content/4/4/298

**Internal Transport in Plants and the Human Circulatory Systems**

Assesses concepts related to transport in plants and the human circulatory system. Three test versions were developed and field-tested for elementary, secondary, and undergraduate students.

(28 two-tiered MC items)

Items not provided.
**EVOLUTION AND ECOLOGY**

**Conceptual Inventory of Natural Selection (CINS)**

Assesses student understanding of natural selection using actual scientific studies. Field-tested with non-majors biology students.

(20 MC items, scenarios)


Items provided at:  
http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CB0QFjAA&url=http%3A%2F%2Fbioliteracy.colorado.edu%2FReadings%2FNatural%2520Selection%2520CI.pdf&ei=rirMU_2wH8uoyAS70oHABg&usg=AFQjCNHer5OD_cVxHba7OAN-sltpeVaLzw&bvm=bv.71198958,d.aWw

**Natural Selection instrument**

Assesses understanding of natural selection using a paper and pencil format. Field-tested with introductory biology students.

(6 open-ended questions)


Items could not be found.

**Measure of Understanding of Macroevolution (MUM)**

Assesses macroevolutionary concepts, including deep time, phylogenetics, speciation, fossils, and nature of science. Field-tested with introductory and capstone-level students.

(28 items: 27 MC items, plus one open-ended item, diagrams)

Items provided at:

**Basic Tree Thinking Assessment**

Assesses interpretation of evolutionary relationships depicted on phylogenetic tree diagrams.

(two tests, 10 MC items each, diagrams)


Items provided at:

**Phylogeny Assessment Tool (PhAT)**

A three-part instrument assessing understanding of the relationship between organism characteristics and evolutionary relationships. Field-tested with introductory organismal biology students.

(3 open-ended questions, diagram)


Instrument provided at:
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3763020/

**Genetic Drift Inventory (GeDI)**

Assesses concepts related to evolution with a particular focus on genetics drift. Field-tested with upper-division biology students.
(22 agree-disagree items)


Items provided at:
http://www.lifescied.org/content/13/1/65.full

**EvoDevo Concept Inventory (EvoDevoCI)**

Assesses developmental aspects of evolution. Field-tested with biology majors.

(MC and open ended items for 3 Exploratory Surveys and 6 Interview Question sets)
(11 MC items, 4 scenarios)


Items provided at:
www.lifescied.org/content/12/3/494
http://www.lifescied.org/content/12/4/665

**Diagnostic Question Clusters on Energy and Matter (DQCs)**

Assesses understanding of pathways and transformations of energy and matter within the context of biological systems. Field-tested with introductory through advanced-level biology students.

(16 DQC sets of ~7 items each, MC, TF, open-ended)


Items available at:
http://www.biodqc.org/downloads