

# Supplemental Material

*CBE—Life Sciences Education*

Simon *et al.*

Supplemental Table 1: List of Textbooks Examined in this Study

First Author	Title	Edition	Year
Audesirk, T. et al.	Biology: Life on Earth	Seventh Edition	2005
Belk, C. et al.	Biology Science for Life with Physiology	Second Edition	2007
Belk, C. et al.	Human Biology		2009
Brooker, R.J. et al.	Biology		2008
Campbell, N.A. et al.	Essential Biology with Physiology		2004
Campbell, N.A. et al.	Biology	Eighth Edition	2008
Chiras, D.D.	Human Biology	Sixth Edition	2008
Enger, E. et al.	Concepts in Biology	Thirteenth Edition	2009
Freeman, S.	Biological Science	Third Edition	2008
Goodenough, J. et al.	Biology of Humans: Concepts, Applications, and Issues	Second Edition	2007
Gunstream, S.E.	Biological Explorations: A Human Approach	Sixth Edition	2009
Hoefnagels, M.	Biology: Concepts and Investigations		2009
Ireland, K.A. et al.	Visualizing Human Biology	Second Edition	2008
Johnson, G.B. et al.	The Living World	Sixth Edition	2010
Johnson, M.D.	Human Biology: Concepts and Current Issues	Fifth Edition	2010
Krogh, D.	Biology: A Guide to the Natural World	Third Edition	2005
Krogh, D.	A Brief Guide to Biology		2007
Losos, J.B. et al.	Biology	Eighth Edition	2008
Mader, S.S.	Human Biology	Ninth Edition	2006
Mader, S.S.	Essentials of Biology		2007
Phelan, J.	What is Life? A Guide to Biology		2010
Phelan, J.	What is Life? A Guide to Biology with Physiology		2011
Russell, P.J. et al.	Biology: The Dynamic Science		2008
Sadava, D. et al.	Life: The Science of Biology	Ninth Edition	2011
Solomon, E.P. et al.	Biology	Eighth Edition	2008
Starr, C. et al.	Biology: Concepts and Applications	Sixth Edition	2006
Starr, C. et al.	Biology: The Unity and Diversity of Life	Eleventh Edition	2006
Starr, C. et al.	Biology: Today and Tomorrow with Physiology	Second Edition	2007
Starr, C. et al.	Human Biology	Seventh Edition	2007

Supplemental Table 2: Coding Guidebook

Code	Definition	Includes	Excludes
<p>Note: all codes refer to the context of the word recovered from the string search. Additional implications of a business entity within the passage are not considered.</p>			
Career Relevant	Pertaining to examples of careers that benefit from a STEM major, or use of STEM learning in other careers	Potential occupations within STEM careers, including academia and industry; examples of how STEM learning and thought processes can help practitioners in either general or specific career trajectories.	Biographies, acknowledgements, credits
Career: Other Use of Term	Fails to comply with definition of Career Relevant; use of search term as metaphor or analogy for biological process; synonym	"Occupation" used to describe spatial location; general analogies or descriptions of life stages; biography, interview, acknowledgement, or credit for data or illustration; exemplar cartoon; demographic description; employment discrimination	Discussion of potential career paths for STEM majors or use of STEM learning for non-STEM career paths.
Industry Relevant	Pertaining to an entity, structure, or practice that involves interaction with the economy through the exchange of money. Use of term in relation to an organization, company, corporation, business, etc.	Commercial farming; general careers; specific company names; Industrial Revolution; biotechnology, pharmaceutical, or energy company; descriptive analogy to biology (simile e.g. "just as a business does...")	References, acknowledgements, copyright page, index, table of contents, single-word or short-phrase metaphorical use of term to explain a biological phenomenon, non-business meaning of the term (e.g. "incorporated" as a part of biological entity rather than as a business entity), publishing credits
Industry: Other Use of Term	Fails to comply with definition of Business Relevant; use of search term as descriptor for biological process	References, acknowledgements, copyright page, index, table of contents, single-word or short-phrase metaphorical use of term to explain a biological phenomenon, non-business meaning of the term (e.g. "incorporated" as a part of biological entity rather than as a business entity), publishing credits	Any reference that involves exchange of money within the economy
Health & Human Impact	Pertaining to human health and wellness through food, drugs or other therapies, lifestyle, or environmental factors	Genetics in context of disease, human genomics, Human Genome Project, human genome sequencing, antibiotic resistance in context of humans suffering from infection, food & nutrition, sexual & behavioral health, industrial practices correlating with disease risk	Antibiotic resistance in context of bacteria, secondary health effects of primary research, basic research without direct health implications, crops specifically used for biofuel production
Environmental Impact	Pertaining to preservation of global or local ecosystem's health or diversity; industry's impact on the environment	Energy, biodiversity, bioremediation, indigenous human economic stability, environmental sustainability, agriculture, fertilizer or nitrogen fixation, natural resources, industrial soot or pollution, environmental justice, GM crops or organic farming practices	Microenvironments (smaller than human-sized environment), antibiotic resistance unless as a result of environmental change, business or industrial environments, behavior of a single species, environmental impact on industry, extermination industry; interspecies interaction; industrial melanism
Positive Connotation	Relates explicitly to action of business on populations, society or environment that have, or are intended to have, a beneficial impact	Positive impact on health, human welfare, food production, remediation, standard of living, jobs, earnings, or profit; new or growing industries or opportunities; value creation; problem-solving; commercial [positive noun]; Human Genome Project; increased survivorship during Industrial Revolution; fertilizer improving food production	Alteration, "change" unless a clear change to better circumstances, consequence, impact of populations or environment on business, unethical practices, any colorimetric change, general significance in absence of value judgement, description of commercial products and/or services; population increase during Industrial Revolution; fertilizer runoff
Negative Connotation	Relates explicitly to action of business on populations, society, individuals, or environment that have, or are intended to have a detrimental impact	Loss of genetic diversity; negative impact on health, human welfare, food production, environment even if remediated; unethical practices and behaviors; expense; cost; resource consumption, depletion, limitation, or exploitation; waste; excess; detriment to health or environment; delusion; industrial soot or pollution; CO2 emissions; commercial [negative noun]	Profit; any quantification unless accompanied by negative value judgement; resource utilization; colorimetric change; impact of populations or environments on business; industrial melanism; patents restricting information
Synergy	Science incorporated into or supporting the growth or practice of business	Company-sponsored research projects; biotechnology company; scientific research, R&D protocols, or results in company context; technical publication by industrial team; patent filing, licensing, or protection; company employing or collaborating with scientist or engineer; clinical trial or equivalent trial of non-therapeutic product	General environmental preservation goals or practices; passive by-products of business practices that open new scientific inquiry; comparison between science and business practices, hypothetical project proposals, general technology or industrial procedures or services, high-tech services
Conflict	Business interfering with the practice of science, or science interfering with the practice of business	Difficulties in scientific inquiry based on business practices, unethical science or scientific practices, restriction on research from patents, restriction on publication based on funding source, direct blockage of science by business or business by science, questioning validity of scientific results based on industry point of view	General environmental degradation or change, patents or protections in general (i.e. protecting intellectual property); conflicts in priorities, procedures, or goals between the practice of business and the practice of science

Supplemental Table 3: Inter-Rater Reliability (IRR, calculated using Cohen’s kappa coefficient)

Search Term	Business Relevant	Positive Connotations	Negative Connotations	Both Positive and Negative (balanced)	Synergy	Conflict
All	99.13%	92.66%	97.63%	92.12%	93.30%	100.00%
Health & Human Impact	94.86%	92.54%	97.24%	94.74%		
Environmental Impact	93.88%	94.89%	98.78%	90.30%		

Business	100.00%	95.77%	91.26%
Commerce	100.00%	100.00%	N/A
Commercial	89.33%	95.39%	89.22%
Company	95.98%	100.00%	100.00%
Corporate	100.00%	100.00%	N/A
Corporation	81.08%	85.91%	77.42%
Earnings	100.00%	N/A	N/A
Income	90.68%	N/A	N/A
Incorporated	N/A	N/A	N/A
Industrial	91.14%	97.41%	81.97%
Industry	92.12%	99.15%	94.06%
Profit	94.55%	95.22%	91.89%
Revenue	100.00%	100.00%	100.00%