

Supplemental Material

CBE—Life Sciences Education

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Table S1. NRC's Framework Grade Band Endpoints for 8th Grade Targeted by Toward High School Biology

- PS1.A **All substances are made from some 100 different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. Pure substances are made from a single type of atom or molecule; each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.**
- PS1.B **Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. The total number of each type of atom is conserved, and thus the mass does not change.** Some chemical reactions release energy, others store energy.
- LS1.C **Plants**, algae (including phytoplankton), and many microorganisms use the energy from light to **make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen.** These sugars can be used immediately or **stored for growth** or later use. **Animals obtain food from eating plants or eating other animals. Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth,** or to release energy. In most animals and plants, oxygen reacts with carbon-containing molecules (sugars) to provide energy and produce carbon dioxide; anaerobic bacteria achieve their energy needs in other chemical processes that do not require oxygen.
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Note: Only bolded section of the grade band end points were targeted by the THSB unit.

Table S2: Demographic information for each class participating in the study

Group & Teacher	Class	# of students	THSB Chapters completed	Gifted & Talented class?	Mean Pre-test Score	Gender		Ethnicity					Primary Language		
						Male	Female	White	Asian	Black	Hispanic	2 or more	English	Other	
Experienced	1	1	27	4	Yes	-0.27	56%	44%	52%	30%	7%	7%	4%	93%	7%
		2	17	4	No	-0.74	53%	47%	29%	47%	24%	0%	0%	82%	18%
		3	30	4	Yes	-0.59	50%	50%	53%	30%	3%	3%	10%	93%	7%
		4	15	4	No	-1.31	40%	60%	40%	7%	33%	13%	7%	93%	7%
		5	19	4	No	-0.87	63%	37%	37%	32%	16%	11%	5%	84%	16%
	2	1	18	3.5	Yes	-0.32	67%	33%	56%	6%	17%	17%	6%	100%	0%
		2	16	3.2	No	-1.04	50%	50%	13%	6%	56%	6%	19%	94%	6%
		3	13	3.3	No	-1.51	46%	54%	8%	23%	69%	0%	0%	92%	8%
	4	29	3.5	Yes	-0.45	62%	38%	55%	14%	24%	0%	7%	100%	0%	
Novice	3	1	21	3.3	Yes	0.06	57%	43%	81%	10%	0%	0%	10%	100%	0%
		2	17	2.8	No	-1.32	41%	59%	24%	6%	53%	12%	6%	82%	18%
		3	14	3.3	Yes	-0.13	71%	29%	21%	14%	7%	14%	43%	100%	0%
		4	12	2.5	No	-1.75	50%	50%	0%	0%	17%	75%	8%	33%	67%
		5	17	2.8	No	-1.13	29%	71%	18%	6%	47%	24%	6%	94%	6%
	4	1	19	2.8	No	-0.55	53%	47%	58%	21%	5%	5%	11%	89%	11%
		2	20	2.8	No	-0.61	55%	45%	65%	20%	5%	5%	5%	100%	0%
		3	16	2.8	Yes	0.03	63%	38%	38%	56%	0%	0%	6%	100%	0%
		4	30	2.8	Yes	0.05	63%	37%	37%	60%	0%	0%	3%	100%	0%
	5	28	2.8	Yes	-0.15	57%	43%	43%	54%	0%	0%	4%	96%	4%	
Comparison	5	1	17	0	No	-0.19	59%	41%	65%	6%	12%	6%	12%	100%	0%
		2	25	0	Yes	0.30	60%	40%	56%	40%	0%	4%	0%	92%	8%
		3	20	0	Yes	0.19	60%	40%	45%	30%	5%	5%	15%	100%	0%
		4	27	0	Yes	0.46	44%	56%	48%	44%	0%	7%	0%	74%	26%
		5	26	0	Yes	0.37	65%	35%	46%	46%	0%	8%	0%	81%	19%
	6	1	21	0	Yes	-0.51	57%	43%	52%	19%	19%	5%	5%	86%	14%
		2	20	0	No	-1.12	50%	50%	20%	10%	40%	20%	10%	90%	10%
		3	25	0	Yes	-0.47	64%	36%	52%	8%	20%	8%	12%	100%	0%
	4	15	0	No	-0.92	40%	60%	7%	20%	47%	20%	7%	87%	13%	