

Supplemental Material

CBE—Life Sciences Education

Xu et al.

Small changes: Using assessment to direct instructional practices in large-enrollment biochemistry courses

Supplementary Documents

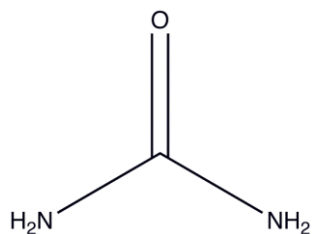
Table 1s Percentage of students picking the ideas consistently across three items

Term	Statement consistency %, three items	A	B	C	D	Not consistent
Hydrogen Bonding						
Fall 2014	Pretest	24.2	34.8	9.1	8.1	23.7
	Posttest	29.8	41.4	5.6	2.0	21.2
Winter 2015	Pretest	22.0	31.2	7.9	9.2	29.7
	Posttest	70.6	6.8	1.8	2.6	18.1
Spring 2015	Pretest	12.6	29.1	8.5	9.5	40.2
	Posttest	70.9	9.0	1.0	2.5	16.6
Fall 2015	Pretest	16.7	31.0	6.4	6.1	39.8
	Posttest	59.7	16.2	2.2	1.7	20.1
Bond Energy						
Fall 2014	pretest	28.3	0.5	0.0	24.7	46.5
	posttest	30.8	0.5	0.0	31.8	36.9
Winter 2015	pretest	23.1	0.8	0.0	29.1	47.0
	posttest	59.8	0.3	0.0	12.6	27.3
Spring 2015	pretest	17.1	1.0	0.5	25.6	55.8
	posttest	52.3	2.0	0.5	16.1	29.1
Fall 2015	pretest	19.9	0.2	0.2	26.8	52.8
	posttest	50.1	0.2	0.0	16.7	32.9
pK _a						
Fall 2014	pretest	16.2	4.5	7.1	-	73.2
	posttest	64.6	0.0	2.0	-	33.3
Winter 2015	pretest	17.6	1.0	4.7	-	73.2
	posttest	69.3	0.0	1.6	-	29.7
Spring 2015	pretest	11.1	2.5	5.0	-	77.4
	posttest	65.3	0.0	3.5	-	31.7
Fall 2015	pretest	13.3	1.2	6.4	-	77.1
	posttest	60.0	0.0	1.5	-	38.8

The clicker question used in Fall 2014

Urea is a water-soluble product of nitrogen metabolism. How many hydrogen bonds can one urea molecule donate to surrounding water molecules?

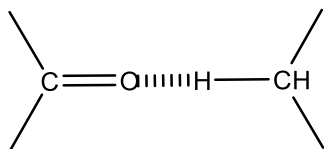
- A) 2
- B) 3
- C) 4
- D) 5
- E) 6



Clicker questions added from Winter 2015

Is this (the dotted line) a hydrogen bond?

- A. Yes
- B. No



Is this (the dotted line) a hydrogen bond?

- A. Yes
- B. No

