

Nature of Science Survey--Pre Data

	Question 1		Question 2		Question 3		Question 4		Question 5	
	Response	Score	Response	Score	Response	Score	Response	Score	Response	Score
Student A	4	-1	4	-1	3	0	2	-1	3	0
Student B	4	-1	1	1	1	-1	5	1	3	0
Student C	4	-1	1	1	2	-1	5	1	3	0
Student D	5	-1	1	1	3	0	4	1	4	1
Student E	5	-1	1	1	2	-1	5	1	5	1
Student F	2	1	1	1	3	0	4	1	3	0
Student G	1	1	1	1	5	1	5	1	3	0
Student H	2	1	5	-1	5	1	3	0	3	0
Student I	3	0	4	-1	1	-1	3	0	2	-1
Student J	1	1	1	1	1	-1	4	1	4	1
Student K	5	-1	1	1	3	0	5	1	2	-1
Student L	1	1	5	-1	1	-1	4	1	1	-1
Student M	5	-1	1	1	1	-1	5	1	1	-1
Student N	3	0	1	1	2	-1	4	1	5	1
Student O	3	0	1	1	3	0	3	0	4	1
Student P	4	-1	4	-1	3	0	5	1	4	1
Student X	3	0	4	-1	1	-1	3	0	5	1
Student Y	4	-1	1	1	1	-1	1	-1	5	1
Student Z	4	-1	1	1	2	-1	1	-1	2	-1
AVG.	3.50	-0.50	2.00	0.33	2.00	-0.67	2.83	0.00	4.17	0.67

The "response" column indicates the number (choices 1-5) circled by the student on that question.

To score the response, we binned the responses into expert-like (favorable), neutral, and novice-like (unfavorable)--see below. Favorable receives a score of +1, neutral is 0, and unfavorable is -1. The "score" column indicates whether the student responded favorably, neutrally or unfavorably.

	Favorable (Score +1)	Neutral (Score 0)	Unfavorable (Score -1)
Question 1	Disagree (1 or 2)	3	Agree (4 or 5)
Question 2	Disagree (1 or 2)	3	Agree (4 or 5)
Question 3	Agree (4 or 5)	3	Disagree (1 or 2)
Question 4	Agree (4 or 5)	3	Disagree (1 or 2)
Question 5	Agree (4 or 5)	3	Disagree (1 or 2)

Nature of Science Survey--*Post Data*

	Question 1		Question 2		Question 3		Question 4		Question 5	
	Response	Score	Response	Score	Response	Score	Response	Score	Response	Score
Student A	3	0	5	-1	3	0	2	-1	4	1
Student B	4	-1	1	1	1	-1	4	1	2	-1
Student C	3	0	1	1	3	0	5	1	3	0
Student D	1	1	1	1	4	1	4	1	4	1
Student E	2	1	1	1	1	-1	4	1	5	1
Student F	2	1	2	1	4	1	5	1	4	1
Student G	5	-1	5	-1	5	1	5	1	3	0
Student H	3	0	1	1	3	0	5	1	1	-1
Student I	3	0	5	-1	1	-1	3	0	2	-1
Student J	5	-1	5	-1	2	-1	4	1	4	1
Student K	5	-1	1	1	3	0	5	1	4	1
Student L	1	1	5	-1	1	-1	4	1	4	1
Student M	5	-1	1	1	1	-1	5	1	1	-1
Student N	3	0	1	1	2	-1	4	1	4	1
Student O	5	-1	5	-1	5	1	5	1	5	1
Student P	1	1	1	1	3	0	5	1	5	1
Student X	2	1	4	-1	1	-1	4	1	3	0
Student Y	2	1	5	-1	1	-1	5	1	5	1
Student Z	2	1	1	1	3	0	5	1	1	-1
AVG	3.00	0.11	2.68	0.16	2.47	-0.26	4.37	0.84	3.37	0.32

The "response" column indicates the number (choices 1-5) circled by the student on that question.

To score the response, we binned the responses into expert-like (favorable), neutral, and novice-like (unfavorable)--see below. Favorable receives a score of +1, neutral is 0, and unfavorable is -1. The "score" column indicates whether the student responded favorably, neutrally or unfavorably.

	Favorable (Score +1)	Neutral (Score 0)	Unfavorable (Score -1)
Question 1	Disagree (1 or 2)	3	Agree (4 or 5)
Question 2	Disagree (1 or 2)	3	Agree (4 or 5)
Question 3	Agree (4 or 5)	3	Disagree (1 or 2)
Question 4	Agree (4 or 5)	3	Disagree (1 or 2)
Question 5	Agree (4 or 5)	3	Disagree (1 or 2)

Nature of Science Survey--Results

	Q1 Shift	Q2 Shift	Q3 Shift	Q4 Shift	Q5 Shift	Total Shift
Student A	2	0	-1	2	0	3
Student B	0	0	0	0	-1	-1
Student C	1	-2	0	-1	-1	-3
Student D	2	0	1	0	0	3
Student E	1	0	0	0	0	1
Student F	-2	0	-1	0	-1	-4
Student G	0	0	-1	0	-1	-2
Student H	-1	2	-1	1	0	1
Student I	-1	0	2	1	1	3
Student J	-2	-2	0	0	0	-4
Student K	0	0	0	0	2	2
Student L	0	2	2	0	2	6
Student M	1	0	1	0	0	2
Student N	0	-2	1	-2	0	-3
Student O	2	0	-1	0	0	1
Student P	1	0	-1	1	0	1
Student X	1	0	0	1	0	2
Student Y	0	-2	2	2	0	2
Student Z	2	0	1	2	2	7
Average shift	0.37	-0.21	0.21	0.37	0.16	-----

Summary Table

	Pre	Shift	Post
Q1	-0.26	0.37	0.11
Q2	0.37	-0.21	0.16
Q3	-0.47	0.21	-0.26
Q4	0.47	0.37	0.84
Q5	0.16	0.16	0.32

Indicates Substantial Positive Shift

