Supplemental Materials

for

Ripped from the Headlines: Using Current Events and Deliberative Democracy to Improve Student Performance in and Perceptions of Nonmajors Biology Courses

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Table of Contents
(Total pages 13)

- Appendix 1: Policy introduction worksheet
- Appendix 2: Final policy worksheet
- Appendix 3: Assessment survey
- Appendix 4: Demographics of student cohorts
- Appendix 5: Graph of topic importance
Appendix 1: Policy introduction worksheet.

Group Number:

Names of Group Members Present:

Answer the following questions with regard to the unit’s policy question.

1. What problem is the policy question attempting to solve?

2. What thoughts or beliefs do members of your group currently have related to the policy question? Where do these thoughts or beliefs come from (i.e. a documentary, the news, a discussion with a friend)?
3. What questions must your group answer and/or what additional information does your group need to reach an informed decision on the policy question? For each item/question listed, assign a group member to locate the necessary resources and present them to the group.

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<th>Information Needed</th>
<th>Person Responsible</th>
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4. If your group had to reach a decision on this policy question today, what would it be?
Appendix 2: Final policy worksheet.

Group #:_______

1. Write a consensus statement that represents your group’s stance on the policy question. Remember that a consensus should represent the opinions of all group members (least common denominator) and not the majority opinion.

2. Provide rationale to support your consensus statement. In other words, why does your group feel the way it does?
3. Which references helped you reach your consensus? For each reference, list which group member supplied the reference and how the reference factored into your position. Staple any references that you used to this worksheet when you turn it in or provide enough information that I can locate the exact reference if needed.

List the names of all group members in attendance.
Appendix 3: Assessment survey.

Demographic Sheet

Fill in the blank or check the box next to the answer that best describes you.

Age __________

Class Standing: □ Freshman □ Sophomore □ Junior □ Senior □ Other

Sex: □ Male □ Female

Ethnicity: □ American Indian/Alaskan Native □ African American/Black □ Asian □ Hispanic/Latino □ Native Hawaiian/Pacific Islander □ Caucasian/White □ Two or more races □ Other (please describe in the blank) ___________________________________

Country of Origin: ________________________________

If from the United States, State of Origin: ________________________________

How long have you lived in the United States: ______________________

How long have you lived in Alabama: ______________________

Religious Affiliation: _____________________________

Major: ________________________________

Minor: ________________________________

Approximate GPA: ________________

When was the last time you completed a biology course: □ <1 year ago □ 1-3 years ago □ 3-5 years ago □ >5 years ago
Biology Attitude and Perception Survey

Answer each question on the Scantron form provided.

Each of the statements below expresses a feeling towards biology. Please rate each statement on the extent to which you agree using the following scale:

A – Strongly agree  
B – Agree  
C – Neutral  
D – Disagree  
E – Strongly Disagree

1. Biology is interesting to me.  
2. I think biology is fun.  
3. I feel stress when taking biology.  
4. Biology stimulates my thinking.  
5. I enjoy performing biology experiments.  
6. I believe that biology is relevant in my everyday life.  
7. I believe that biology is important for my desired career path.  
8. Biology is important for making political decisions.  
9. Biology is important for making personal choices.  
10. All citizens should have a basic understanding of biology.

How important do you believe it is to understand the following topics? Use the following scale:

A – Very Important  
B – Somewhat Important  
C – Neutral  
D – Minimally Important  
E – Not at All Important

11. Cancer (Human Physiology)  
12. Genetic Testing (Human Development)  
13. The National Debt  
14. Genome Sequencing (Evolution)  
15. Economic Growth  
16. Genetically Modified Foods (Evolution)  
17. Vaccinations (Human Physiology)  
18. Climate Change (Ecology)  
19. Poverty  
20. Human Population Growth (Ecology)

Note: Italics represents unit division for data analysis. This information was not provided on students’ assessments.
How well do you believe that you currently understand the following topics? Use the following scale:

A – Very Well
B – Well
C – Neutral
D – Not Very Well
E – Not at All

21. Cancer (*Human Physiology*)
22. Genetic Testing (*Human Development*)
23. The National Debt
24. Genome Sequencing (*Evolution*)
25. Economic Growth
26. Genetically Modified Foods (*Evolution*)
27. Vaccinations (*Human Physiology*)
28. Climate Change (*Ecology*)
29. Poverty
30. Human Population Growth (*Ecology*)

*Note: Italics represents unit division for data analysis. This information was not provided on students’ assessments.*
**Biology Content Quiz**

Fill in the bubble corresponding to the best answer to each question on the Scantron form that is provided.

*Note: Italics represents unit division for data analysis. This information was not provided on students’ assessments.*

31. The basic unit of a molecule is a(n) ________________________. *(Human Development)*
   - a. Proton
   - b. Neutron
   - c. Atom
   - d. Electron
   - e. Neuron

32. Which of the following organelles is the site of photosynthesis? *(Evolution)*
   - a. Mitochondria
   - b. Golgi Apparati
   - c. Endoplasmic Reticula
   - d. Chloroplasts
   - e. Vesicles

33. Type of symbiotic relationship wherein the actions of one individual harms another: *(Ecology)*
   - a. Mutualism
   - b. Parasitism
   - c. Commensalism
   - d. Populism

34. Of the following types of bonds, which is formed when two atoms share electrons? *(Human Development)*
   - a. Ionic bonds
   - b. Proton bonds
   - c. Hydrogen bonds
   - d. Covalent bonds
   - e. Atomic bonds

35. The number of living species is estimated to be: *(Ecology)*
   - a. 2 million
   - b. 10—50 million
   - c. 2 billion
   - d. 10—50 billion

36. Which of these correctly illustrates increasing complexity in the natural world? *(Ecology)*
   - a. individual, community, population, ecosystem
   - b. individual, population, community, ecosystem
   - c. individual, population, ecosystem, community
   - d. individual, ecosystem, community, population

37. This is the scientific name for the Eastern Gray Squirrel. Which is correctly written? *(Human Development)*
   - a. Sciurus carolinensis
   - b. sciurus carloinensis
   - c. Sciurus Carolinensis
   - d. Sciurus carolinensis

38. Which of these is a correct statement? *(Ecology)*
   - a. a population is made up of many species
   - b. a population is made up of many communities
   - c. a species is made up of many populations
   - d. a species is made up of many communities
39. Which is the correct order for the Linnaeus hierarchical classification system, with the most inclusive group (the group that contains the most species) listed first? (Human Development)
   a. Kingdom, Phylum, Order, Class, Family, Genus, Species
   b. Kingdom, Phylum, Class, Family, Order, Genus, Species
   c. Kingdom, Class, Phylum, Order, Family, Genus, Species
   d. Kingdom, Phylum, Class, Order, Family, Genus, Species

40. A change in allele frequencies in a population over time. (Evolution)
   a. gene pool
   b. gene bank
   c. evolution
   d. genetic diversity

41. A flashlight stops working during a campout. Which of the following are possible hypotheses to explain why the flashlight quit working? (Human Development)
   a. the flashlight doesn’t work
   b. perhaps the batteries are dead
   c. replace the batteries
   d. tell all of your friends don’t go camping

42. Which of the following are not eukaryotes? (Ecology)
   a. animals
   b. plants
   c. algae
   d. bacteria
   e. fungi

43. How many pairs of chromosomes are present in the typical human cell? (Human Development)
   a. 1
   b. 22
   c. 23
   d. 46
   e. 1 trillion

44. Which stage of the cell cycle takes up the most time? (Human Development)
   a. prophase
   b. metaphase
   c. anaphase
   d. telophase
   e. interphase

45. Scientists estimate the age of the Earth to be (Ecology)
   a. 100 years old
   b. 1.5 million years old
   c. 1 billion years old
   d. 4.6 billion years old
   e. 500 billion years old

46. Which term best describes a proposed explanation for an observed phenomenon? (Human Development)
   a. theory
   b. paradigm
   c. hypothesis
   d. law
47. Which process produces gametes? *(Human Development)*
   a. mitosis
   b. meiosis
   c. budding
   d. binary fission

48. Which is the correct order of information flow during gene expression? *(Human Development)*
   a. DNA → RNA → protein
   b. protein → DNA → RNA
   c. RNA → DNA → protein
   d. protein → RNA → DNA

49. Which is not a feature of an animal cell? *(Ecology)*
   a. cell wall
   b. cell membrane
   c. mitochondria
   d. lysosome

50. Which of the following is not necessarily a feature of a species? *(Evolution)*
   a. members are within the same genus
   b. members have similar genes
   c. members can breed with one another to produce fertile offspring
   d. members live in the same region of the world
Appendix 4: Demographics of student cohorts.

With the exception of average GPA and N, all values are percentage of total cohort. N represents the number of students completing the survey during the first week of class (introductory) and the last week of class (exit). Average GPA was compared across groups using a student’s t test. All other distributions were compared using a Chi squared analysis. *The mixed format cohort differed from the other two cohorts with regard to gender and college affiliation. **The traditional lecture cohort differed with the other cohorts with regard to race and ethnicity.

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Appendix 5: Graph of topic importance.

This graph depicts the fold change in students’ classification of each topic as important or very important.