

Pre-Workshop Survey 2006
[DATE, LOCATION]

BioTeach is collecting data about what participants know, do, and believe before they receive training. There are no "correct" answers so don't feel you should know anything yet! Your privacy will be protected and your name and school will not be included in any reports. Thank you for providing this information that will help BioTeach staff improve the program. Please return the completed survey to the program evaluator.

1. Name: _____ 2. School: _____

3. Role: In the list below, select your primary role. Select one only.

- a. _____ Science teacher
- b. _____ Science department chair (teaching)
- c. _____ Science department chair (NON teaching)
- d. _____ District/school administrator (specify) _____
- e. _____ Guidance staff (specify) _____

4. Select your highest degree earned. Select one.

- a. _____ Bachelors level (e.g., BA, BS)
- b. _____ Masters level (e.g., MA, MS, M.Ed.)
- c. _____ Doctoral level (e.g., Ph.D., Ed.D)
- d. In what field is your highest degree? _____
- e. Other (please specify) _____

5. Working with students

- a. How many years have you been teaching students in classrooms? _____
- b. How many years have you been teaching science? _____
- c. How many years have you been working with students in roles other than teaching such as in guidance or administrative positions? _____

6. What are you hoping to learn in this three-day BioTeach training?

7. During the last five years, did you attend any workshops or classes other than BioTeach on the topics of biotechnology or teaching about biotechnology? If so, record the number of workshops for each duration listed below. As a reference point, consider one “day” to be 7 hours.

a. _____ I attended NO other biotechnology workshops in the last five years.

Length of workshops in 7 hour days	Number of workshops
Less than a day to one seven hour day	
Multi day workshops	
Semester-long courses	

8. We are interested in what you know about biotechnology and the teaching of biotechnology, and in your beliefs about its importance. Please rate your knowledge about the following topics by placing an “X” in the appropriate box in the chart below.

<i>My knowledge about this topic is:</i>	None or very little	Some	Moderate	Extensive
The definition of biotechnology				
The role of biotechnology in modern life				
Biology concepts underlying biotechnology				
Procedures and techniques used in biotechnology				
Careers in biotechnology				
How to <i>teach about</i> concepts underlying biotechnology				
How to <i>teach about</i> procedures and techniques used in biotechnology				
How to <i>teach about</i> careers in biotechnology				
How to incorporate biotech curriculum into the science courses you teach				

9. What aspects of biotechnology or biotechnology careers are important for your students to learn about? Why are these important?

10. Last year (2005-06), did you teach any courses with biology or biotechnology content? Select yes or no for each course. If yes, note how many sections of the course and the average number of students per section.

Course	Did you teach it		How many sections	Average # of students per section
	Yes	No		
Intro/ General Biology	Yes	No		
Integrated Science	Yes	No		
Honors Biology	Yes	No		
AP Biology	Yes	No		
Biotechnology	Yes	No		
Second year Biology/ Special topics	Yes	No		
Other (please specify which course)	Yes	No		

For Questions 11-14 we are interested in how intensively you focused on particular biotechnology related topics, techniques, and labs, and whether that differed at different course levels.

11. Pick one course that you taught at the **Introductory level** (e.g., Intro or General Biology, or Integrated Science) and one course that you taught at an **Advanced level** (e.g., Honors biology, Second year biology, AP Biology). If you taught more than one course at a particular level, please select *one* which you will rate in questions 12–14.

Introductory level course I will be rating below: _____

OR, I did not teach any course at this level: _____

Advanced level course I will be rating below: _____

OR, I did not teach any course at this level: _____

12. In the Introductory and Advanced level courses you listed above, how intensely did you focus on the following topics related to biotechnology during the 2005-06 academic year? Please use the following four-point scale, and give separate ratings for introductory and advanced level courses.

1—not at all	2—mentioned	3—minor focus	4—major focus
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Topics	Introductory Level Course listed above				Advanced Level Course listed above			
Mendelian genetics	1	2	3	4	1	2	3	4
DNA structure	1	2	3	4	1	2	3	4
DNA replication, transcription, translation	1	2	3	4	1	2	3	4
Protein structure and function	1	2	3	4	1	2	3	4
Carbohydrate structure and function	1	2	3	4	1	2	3	4
Lipid structure and function	1	2	3	4	1	2	3	4
Microbes and microbial genetics	1	2	3	4	1	2	3	4
Genetic engineering	1	2	3	4	1	2	3	4
Drug development and manufacturing	1	2	3	4	1	2	3	4
Other biotech topic, please specify _____	1	2	3	4	1	2	3	4

13. In the Introductory and Advanced level courses you listed above (Q11), did you teach any of the following laboratory techniques associated with biotechnology during 2005-06?

Laboratory Techniques	Introductory Level Course listed above		Advanced Level Course listed above	
Genomic DNA extraction and spooling	Taught teach	Didn't	Taught teach	Didn't
Bacterial transformation	Taught teach	Didn't	Taught teach	Didn't
Isolation of plasmid DNA through Mini-Prep	Taught teach	Didn't	Taught teach	Didn't
DNA fingerprinting through restriction analysis	Taught teach	Didn't	Taught teach	Didn't
Agarose protein gel electrophoresis	Taught teach	Didn't	Taught teach	Didn't
PCR	Taught teach	Didn't	Taught teach	Didn't
Chromatography	Taught teach	Didn't	Taught teach	Didn't

14. In the Introductory and Advanced level courses you listed above (Q11), which of the following pieces of lab apparatus did you teach students to use during 2005-06?

	Introductory Level Course listed above		Advanced Level Course listed above	
Balance	Taught	Didn't teach	Taught	Didn't teach
Micropipette	Taught	Didn't teach	Taught	Didn't teach
Serological pipette	Taught	Didn't teach	Taught	Didn't teach
Vortex	Taught	Didn't teach	Taught	Didn't teach
Centrifuge	Taught	Didn't teach	Taught	Didn't teach
Gel electrophoresis box	Taught	Didn't teach	Taught	Didn't teach
Transfer loops	Taught	Didn't teach	Taught	Didn't teach
Incubator	Taught	Didn't teach	Taught	Didn't teach
Agar plate	Taught	Didn't teach	Taught	Didn't teach

15. How prepared do you feel to teach the following lab techniques to students? Place an "X" in the appropriate box in the chart below.

	Not	Somewhat	Moderately	Extensively
Bacterial transformation				
Agarose gel protein electrophoresis				
DNA fingerprinting through restriction analysis				

16. How frequently, if at all, did you implement the following activities for students last year?

	Not at all	Number of times
A field trip to the BU City Lab		
A field trip to a biotechnology company		
A scientist to speak to a class about biotechnology		
A scientist to speak to an assembly about biotechnology		
A presentation about continuing education (e.g., college) in biotechnology		
A "virtual" activity about biotechnology		
Other (please specify) _____		

17. During 2005-2006, to what extent did you provide information to or communicate with a *guidance counselor or career activities specialist/ tech prep coordinator* about biotechnology and/or life science careers (e.g., medicine or scientific research) for students?

Not at all	Number of times

18. How much do you think communicating to *classes* of students (i.e., as part of instruction rather than in individual discussions) about possible careers or further education in life sciences including biotechnology SHOULD be part of the job of a teacher?

Not a part of a teachers' job	Should be a small part, once or twice a year	Should be a moderate part, several times a year	Should be a large part, at least once each month

19. During 2005-06, how much would you say you ACTUALLY communicated to *classes* of students (i.e., as part of instruction rather than in individual discussions) about possible careers or further education in the life sciences including biotechnology?

a. _____ Not applicable, I am not a teacher or a member of the guidance staff

Not to classes of students	In a small way, once or twice a year	In a moderate way, several times a year	In a large way, at least once each month

20. Please use the space below to explain any difficulties you had with questions on the survey.

*You have now completed the BioTeach 2006 Pre-workshop Survey.
Please return it to the Program Evaluator. Thank you!
TERC, 2067 Massachusetts Ave., Cambridge MA 02140*

Post-Workshop Survey 2006
[Date, location]

Thank you for providing this information that will help BioTeach staff improve the program and structure your follow up training. Please return the completed survey to a Kate Lamanna or to the envelope at the front.

1. Name: _____ 2. School: _____

3. For the **bacterial transformation lab**, place an “X” in the appropriate box in the chart below, to indicate the extent you were able to ...

For bacterial transformation	Not at all	Somewhat	Moderately	Extensively
...learn more about the laboratory equipment				
...understand and complete the lab techniques				
...discuss and interpret the results				
...integrate the lab with your curriculum for at least one class				

4. For the **agarose gel electrophoresis lab (Mystery of the Crooked Cell)**, place an “X” in the appropriate box in the chart below, to indicate the extent you were able to ...

For agarose gel electrophoresis	Not at all	Somewhat	Moderately	Extensively
...learn more about the laboratory equipment				
...understand and complete the lab techniques				
...discuss and interpret the results				
...integrate the lab with your curriculum for at least one class				

5. For the **restriction analysis lab (DNA Fingerprinting)**, place an “X” in the appropriate box in the chart below, to indicate the extent you were able to ...

For DNA fingerprinting	Not at all	Somewhat	Moderately	Extensively
...learn more about the laboratory equipment				
...understand and complete the lab techniques				
...discuss and interpret the results				
...integrate the lab with your curriculum for at least one class				

6. After this initial training, how **prepared** do you feel NOW to teach the lab techniques to students? Place an “X” in the appropriate box in the chart below.

Labs	Not at all	Somewhat	Moderately	Extensively
Bacterial transformation				
Agarose gel protein electrophoresis				
DNA fingerprinting through restriction analysis				

7. Please circle the learning centers you attended in the afternoon of each day and place a check in the box that best indicates their usefulness to you.

Circle the learning center	Not at all	Somewhat	Moderately	Extensively
Day One Exchange 1. Lab Practice 2. Collegial 3. Content Check				
Day Two Exchange 1. Lab Practice 2. Collegial 3. Content Check				
Day Three Exchange 1. Lab Practice 2. Collegial 3. Content Check				

8. As you think about teaching biotechnology to students in 2006-2007, what was the single most useful aspect of the training for you?

9. What was the least useful aspect of the training for you? What could be improved?

10. Rate how clearly the MassBio staff communicated about the following procedures.

	Not Applicable	Unclear	Somewhat Clear	Clear
Post application contact about the grant				
Expectations about teacher participation				
Availability of training sessions this summer				
Registration process for workshop				
Directions to workshop site				
Benefits for teachers and schools				

11. When would you like the required fourth day of training (the life science career awareness session) to be? Check one month only and circle a type of day.

MONTH	DAY	
October	Week day	Weekend
November	Week day	Weekend
December	Week day	Weekend
January	Week day	Weekend
February	Week day	Weekend
March	Week day	Weekend

12. We are interested in what you now know about biotechnology and the teaching of biotechnology, and in your beliefs about its importance. Rate your knowledge about the following topics by placing an "X" in the appropriate box in the chart below.

	None or very little	Some	Moderate	Extensive
<i>My knowledge about this topic is:</i>				
The definition of biotechnology				
The role of biotechnology in modern life				
Biology concepts underlying biotechnology				
Procedures and techniques used in biotechnology				
Careers in biotechnology				
<i>How to teach about</i> concepts underlying biotechnology				
<i>How to teach about</i> procedures and techniques used in biotechnology				
<i>How to teach about</i> careers in biotechnology				
How to incorporate biotech curriculum into the science courses you teach.				

13. People need different kinds of supports to integrate biotechnology content and techniques into their classrooms. Rate how much you need each of the following supports to successfully teach biotechnology content or techniques to your students during 2006-07.

Training in...	Not needed	Helpful	Important	Essential
...how to do the specific lab techniques				
...the connections between biology content and the techniques				
...how to manage students in a lab situation				
...how to acquire materials for the labs				
...how to use and care for specific equipment				
...making labs relevant to the daily lives of students				
... teaching students about biotechnology careers				

14. How much do you think communicating to *classes* of students (i.e., as part of instruction rather than in individual discussions) about possible careers or further education in life sciences SHOULD be part of the job of a teacher?

Not a part of a teachers' job	Should be a small part, once or twice a year	Should be a moderate part, several times a year	Should be a large part, at least once each month

15. What aspects of biotechnology or biotechnology careers, if any, are important for your students to learn about? Why are these important?

16. How likely is it that you will teach one or more of these lab techniques to students during 2006-2007? Place an "X" in the appropriate box in the chart below.

	Not likely	Somewhat	Moderately	Very likely
Bacterial transformation				
Agarose gel protein electrophoresis				
DNA fingerprinting through restriction analysis				

17. How likely is it that you will use the pre lab news story activities with your students during 2006-2007?

	Not likely	Somewhat	Moderately	Very likely
Cells as factories (flu vaccine)				
Importance of shape (detecting bioweapons)				
Variations in Code (DNA chips and cancer)				

18. If you answered "**Not likely**" for question(s) 16 and/or 17 above, explain why you may not teach those labs or use those stories this year.

19. Use the space below to explain any difficulties you had with questions on this survey.

*You have now completed the BioTeach 2006 Post-Workshop Survey.
Please return it to Kate Lamanna or the envelop at the front. Thank you!*

**BioTeach Winter Workshop—February 10, 2007
Observation protocol**

Session Topic: _____ Time:
 Instructor: _____ Observer:

We are interested in what goes on in the workshop, especially from the perspective of teachers’ experiences; and what teachers say about the impact of the workshop (and the program more generally) with respect to a) their own knowledge/ learning, b) their implementation of the program in their classrooms, and c) the spread of the program to other teachers and staff.

- 1) Note the general activities of the session either a) whenever things shift to a new activity structure or b) every 15 minutes, whichever occurs first. Pay particular attention to what *teachers* are doing and how they participate—are they listening, asking questions, talking amongst themselves (about what), doing labs, etc. Note what’s most typical and also significant variability—e.g., “Most people are listening to the instructor talk through the concepts underlying the sickle cell lab, but a few are talking about classroom implementation.”

Time	Dominant Activity	Significant Minor Activity(s)

2) What do teachers say about their own learning? Keep a tally of number of comments about each of these topics at right. Write significant or interesting comments in the space below.

	<ul style="list-style-type: none"> a) biology or biotechnology concepts b) biotech skills, equipment, techniques c) resources for teaching
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3) What do teachers say about implementation of the BioTeach program? Again, keep a tally of number of comments about each of these topics at right and write significant or interesting comments in the space below.

	<ul style="list-style-type: none"> a) issues and obstacles b) supports c) confidence and efficacy about implementation
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4) What do teachers say about the spread of the BioTeach program? Keep a tally at right and write significant or interesting comments in the space below.

	<ul style="list-style-type: none"> a) sharing w/ peers or other teachers b) sharing with guidance staff c) sharing outside of schools/ w/ industry
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5) Other comments about the follow-up, its utility, timing, content, level of interest, etc.

Outline of Group Interview Questions 2006-2007

Group Interview Questions for Cohort One

Interviews will be about one hour with between 2 and 4 people per “group” interview. They will receive \$30 each.

1. Describe how you used any part of the BioTeach training you received two summers ago **this** academic year.

Prompt if needed about program specifics: basic skills activities; the 4 labs: DNA fingerprinting, Mini prep, PCR, Transformation of *E. Coli* cells; ordering and using kits; equipment purchased with grant money

Probe with which level of student?

Prompt: is this a change from **last** year? Why?

2. I'd like to also ask about any other challenges you have had implementing BioTeach resources and why you may not have chosen to actually use them.

Prompt if needed: challenges in training or materials
school or department structure

3. Do you have any suggestions for how the program could address the challenges you have raised?

4. Are there other things that we have not yet discussed that you think, if changed, could accelerate the integration of biotechnology into your own teaching and the rest of your department this year?

5. On a scale of 1-5 how much impact has the program had on your teaching of biotechnology?

Additional Question for Cohort Two

1. Describe when and how you plan to implement the training if you have not yet done so.

2. What is the name of your high school?

3. In what city or town is your high school?

4. Are you a female or male?

 F M

5. What is your ethnicity?

 Black/African
American Hispanic White/European Native
American/Alaska
Native Mixed Race Native
Hawaii/Pacific
Islander

6. What grade are you in?

 9th 10th 11th 12th

7. What science course are you taking now?

8. What science course do you plan to take next year?

9. What additional science courses do you plan to take before you graduate?

10. Have you taken any Advanced Placement (AP) science courses?

Yes

No

11. Is it your goal to take an Advanced Placement (AP) science course before you graduate?

Yes

No

12. Please list any school clubs or other extracurricular activities related to science in which you are currently participating.

13. Please list any school clubs or other extracurricular activities related to

14. How frequently have you discussed biotechnology ideas or conducted biotechnology lab in your science classroom?

Never Seldom Often Frequently

3. Teacher and Guidance Counselor

15. How often has there been discussion in your science class about life sciences careers?

Never Seldom Often Frequently

16. How often have you had any one-on-one discussions about life sciences careers with your guidance counselors?

Never Seldom Often Frequently

17. Have you utilized any of the following resources to explore life sciences careers?

Brochures Videos Career Assessment Tools Websites Books Other None of these resources

19. If you plan to continue your education, in which kind of educational institution do you plan to enroll?

- Four year college or university Two year community or junior college Vocational or Technical school Not sure

20. How likely are you to major in a science related discipline?

- Sure I won't Not likely Somewhat likely Definitely will

21. From the following list, please indicate the course or courses you need to successfully complete in grades 9 through 12 in order to pursue the career or careers that interest you.

- General Science
 Technical Writing
 Environmental Science
 Biology
 Computer Math
 Chemistry
 Earth Science
 Physics
 Computer Science
 Other (please specify)

22. Has anyone discussed the required courses you will need to major in a science related discipline?

- Yes
 No
 If you answered yes, please specify

- Other Teacher
- None of the above
- Mother (female guardian)
- Friends your age
- Math Teacher
- Science Teacher
- Other (please specify)

5. Life Sciences Career Development Experiences

24. Since entering the 8th grade have you ever taken a science related field trip?

Yes

No

25. If you answered yes to the above question, where did you go on the field trip?

26. Since entering 8th grade have you had a science related job shadow experience?

Yes

No

27. If you answered yes to the above question, please indicate what type of science related job shadow did you experience?

- Healthcare
- Biotech
- Biomedical
- Science Museum
- Other (please specify)

29. If you answered yes to the above question, please indicate what type of professional or professionals you have spoken with. Choose multiple answers if applicable

- Medical Technician
- Nurse
- Researcher
- Scientist
- Doctor
- Other (please specify)

30. Have you ever attended a science related Career Day/Career Fair?

Yes

No

31. If you answered yes to the above question, please indicate the type of career event you attended.

- Healthcare/Medical
- Biotechnology
- Science
- Other (please specify)

- Neighbor
- Relative (other than mother or father)
- Mother (female guardian)
- None of the above
- Other (please specify)

33. Which, if any of the following people have encouraged you to pursue a career in science, technology, engineering or math? (Check all that apply)

- School Administrator
- Parent or Guardian
- Guidance Counselor
- Someone at my current internship
- Friend
- Neighbor
- Relative - other than parent or guardian
- Teacher
- None of the above
- Other (please specify)

34. How much do you know about possible career opportunities for you in science, technology, engineering and math?

- Nothing Very Little Some Knowledge Fair Amount A Lot

7. Thank you for participating in our survey

You have successfully completed the survey and can now close out. Thank you for your input.

2. What is the name of your high school?

2. Life Sciences and Biotechnology Questions

What is Biotechnology?

Break biotechnology into its root words and you have:

Bio - the use of biological processes

Technology - to solve problems or make useful products

Biotechnology is a collection of technologies that capitalize on the attributes of cells, such as their manufacturing capabilities, and put biological molecules, such as DNA and proteins to work for us.

School and Curriculum

3. What science course do you plan to take next year?

4. What additional science courses do you plan to take before you graduate?

5. Is it your goal to take an Advanced Placement (AP) science course before you graduate?

Yes

No

6. Do you intend to participate in any school clubs or other extracurricular activities related to science, math or technology next year?

Yes

No

I don't know

7. If you answered yes to the question above, please list the school clubs or activities related to science, math or technology that you intend to participate in

8. How frequently have you discussed biotechnology ideas or conducted biotechnology lab in your science classroom this year?

Never Seldom Often Frequently

3. Teacher and Guidance Counselor

9. How often has there been discussion in your science class about life sciences careers?

Never Seldom Often Frequently

10. How often have you had any one-on-one discussions about life sciences careers with your guidance counselors?

Never Seldom Often Frequently

11. Have you utilized any of the following resources to explore life sciences careers?

Brochures Videos Career Assessment Tools Websites Books Other None of these resources

13. If you plan to continue your education, in which kind of educational institution do you plan to enroll?

- Four year college or university Two year community or junior college Vocational or Technical school Not sure

14. How likely are you to major in a science related discipline?

- Sure I won't Not likely Somewhat likely Definitely will

15. From the following list, please indicate the course or courses you need to successfully complete in grades 9 through 12 in order to pursue the career or careers that interest you.

- Chemistry
 Biology
 Environmental Science
 Computer Science
 Technical Writing
 Computer Math
 Earth Science
 General Science
 Physics
 Other (please specify)

16. Has anyone discussed the required courses you will need to major in a science related discipline?

- Yes
 No
 If you answered yes, please specify

- Friends your age
- Math Teacher
- Science Teacher
- Other Relative
- Guidance Counselor
- Other Teacher
- None of the above
- Other (please specify)

5. Life Sciences Career Development Experiences

18. During this academic year, have you taken a science related field trip?

Yes

No

19. If you answered yes to the above question, where did you go on the field trip?

20. During this academic year, have you had a science related job shadow experience?

Yes

No

21. If you answered yes to the above question, please indicate what type of science related job shadow did you experience?

- Healthcare
- Biotech
- Biomedical
- Science Museum

23. If you answered yes to the above question, please indicate what type of professional or professionals you have spoken with. Choose multiple answers if applicable

- Scientist
- Nurse
- Researcher
- Doctor
- Medical Technician
- Other (please specify)

24. During this academic year, did you attend a science related Career Day/Career Fair?

Yes

No

25. If you answered yes to the above question, please indicate the type of career event you attended.

- Biotechnology
- Healthcare/Medical
- Science
- Other (please specify)

- Relative - other than parent or guardian
- Friend
- Neighbor
- Someone at my current internship
- School Administrator
- Parent or Guardian
- None of the above
- Other (please specify)

27. How much do you know about possible career opportunities for you in science, technology, engineering and math?

- Nothing Very Little Some Knowledge Fair Amount A Lot

7. Thank you for participating in our survey

You have successfully completed the survey and can now close out. Thank you for your input.

Life Sciences Career Development Pilot Fall Survey - December 2006

Name: _____ School: _____

Your role (e.g., science teacher, guidance counselor, etc.): _____

Biotechnology Career Knowledge

Please rate your level of knowledge about the following areas:

	No Knowledge		Very Knowledgeable			Don't Know	Not Applicable
	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
1. The range of jobs available for high school graduates in most biotechnology companies	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
2. The opportunities available in the biotechnology field for graduates of two-year college science/biotechnology programs.	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
3. The opportunities available in the biotechnology field for graduates of four-year college science/biotechnology programs.	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
4. The high school requirements necessary for:							
Biotechnology work directly after high school	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
Continued study in a 2 year science/biotech program	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
Continued study in a 4-year science/biotech program	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
5. What additional areas would you like to learn more about to effectively design and offer life science career development activities for students?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
6. What, if anything, has interfered with your developing knowledge of careers in the life sciences including biotechnology?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>

Collaboration

Please consider the extent of collaboration outside of team work/team meetings last year (2005-2006).

	Not at all		To a great extent			Don't Know	Not Applicable
	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
7. To what extent did guidance counselors and science teachers work together to discuss students' educational needs related to careers in the sciences?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
8. To what extent did guidance counselors and science teachers work together to plan and implement activities to enhance student awareness and interest in science careers?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>

Life Sciences Career Development Pilot Fall Survey - December 2006

Collaboration—In your team

Please answer the following questions based on your team's work last year (2005-2006).

I was not part of a BioTeach team last year.
(please skip questions 9-13)

	Not at all		To a great extent			Don't Know	Not Applicable
	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
9. To what extent were team members able to share knowledge and perspectives during team meetings and/or other activities?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
10. To what extent did you take a leadership role on the team?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
11. To what extent did collaboration help you to learn more about science experiences that might enhance students' interest in biotechnology?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
12. To what extent did collaboration help you to learn more about career awareness activities that might enhance students' interest in biotechnology?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
13. What were the most positive aspects of your team work last year?							
14. What interfered with the team's collaboration last year?							
15. What are your personal goals for the team during the 2006-2007 academic year?							
16. <i>(For guidance counselors only:)</i> What kinds of data (numbers or information) have you collected and/or used in the past two years? How have you used these data?							

Life Sciences Career Development Pilot Spring Survey - May 2007

Name: _____ School: _____

Your role (e.g., science teacher, guidance counselor, etc.): _____

Biotechnology Career Knowledge

Please rate your level of knowledge about the following areas:

	No Knowledge					Very Knowledgeable					Don't Know	Not Applicable
	1	2	3	4	5	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
1. The range of jobs available for high school graduates in most biotechnology companies	1	2	3	4	5						<input type="checkbox"/>	<input type="checkbox"/>
2. The opportunities available in the biotechnology field for graduates of two-year college science/biotechnology programs.	1	2	3	4	5						<input type="checkbox"/>	<input type="checkbox"/>
3. The opportunities available in the biotechnology field for graduates of four-year college science/biotechnology programs.	1	2	3	4	5						<input type="checkbox"/>	<input type="checkbox"/>
4. The high school requirements necessary for:												
Biotechnology work directly after high school	1	2	3	4	5						<input type="checkbox"/>	<input type="checkbox"/>
Continued study in a 2 year science/biotech program	1	2	3	4	5						<input type="checkbox"/>	<input type="checkbox"/>
Continued study in a 4-year science/biotech program	1	2	3	4	5						<input type="checkbox"/>	<input type="checkbox"/>
5. In what areas, if any, did your work with the team help you to effectively design and offer life science career development activities for students?												
6. What, if anything, interfered with your developing knowledge of careers in the life sciences including biotechnology?												

Life Sciences Career Development Pilot Spring Survey - May 2007

Collaboration--Outside your team

*Please consider the extent of collaboration outside of team work/team meetings at your school **this year (2006-2007)**.*

	Not at all					To a great extent		Don't Know	Not Applicable
	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>		
7. To what extent did guidance counselors and science teachers work together to discuss students' educational needs related to careers in the sciences?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>		
8. To what extent did guidance counselors and science teachers work together to plan and implement activities to enhance student awareness and interest in science careers?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>		

Collaboration—In your team

*Please answer the following questions based on your team's work **this year (2006-2007)**.*

	Not at all					To a great extent		Don't Know	Not Applicable
	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>		
9. To what extent were team members able to share knowledge and perspectives during team meetings and/or other activities?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>		
10. To what extent did you take a leadership role on the team?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>		
11. To what extent did collaboration help you to learn more about science experiences that might enhance students' interest in biotechnology?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>		
12. To what extent did collaboration help you to learn more about career awareness activities that might enhance students' interest in biotechnology?	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>		
13. What were the most positive aspects of your team work this year?									

**Life Sciences Career Development Pilot
Spring Survey - May 2007**

14. What interfered with the team's collaboration or your participation this year?

15. Did the work of your team meet your personal goals/expectations? Why or why not?

16. ***(For guidance counselors only:)***

A) What kinds of data (numbers or information) have you collected related to STEM education/careers this year

B) Is this different from past years?

C) How have you used these data?

promote life sciences education in Massachusetts schools, and to increase biotechnology workforce development efforts. Your participation in this survey is entirely voluntary--whether or not you participate in the survey will not affect your participation in the BioTeach program, your job, or any future relationship with MassBioEd or TERC. The answers you provide will only be seen by the MassBioEd staff and the TERC evaluators. Nearly all evaluation results will be presented in the aggregate--if we ever use individual quotes, the identity of individuals and their schools/ districts will be masked by pseudonyms. These results may be published in print or online, or presented at academic or other conferences. As a thank you for your time, if you complete the survey, you will receive a gift certificate worth \$10 from Barnes & Noble by US mail by June 15. We encourage your candid responses and greatly appreciate your input.

By clicking the "I agree to complete the survey" button below, I indicate that I have read and understand the information above and voluntarily agree to participate in the 2007 BioTeach on-line questionnaire.

- I agree to complete the survey.
- I do not wish to participate in the survey and acknowledge I will not receive a gift certificate.

3. Your first and last name

4. Your role

- Department chair, teaching
- Science teacher
- Department chair, not teaching
- Other (please specify)

Department Chair Questions

5. LAST YEAR from September, 2005-June, 2006, across all science teachers' classrooms, estimate what percent of science students participated in wet laboratory activities.

Percent of All Science students

Advanced (honors, AP, etc.) Biology Courses

Regular Biology Courses

6. THIS YEAR from September, 2006-June, 2007, across all science teachers' classrooms, estimate what percent of science students participated in wet laboratory activities.

Percent of All Science Students

Advanced (honors, AP, etc.) Biology Courses

Regular Biology Courses

7. What amount of school funds (i.e. not grant funds) were used to purchase biology lab consumables/equipment for 2006-2007? Please provide a single number estimate such as \$9200 or \$600 rather than a range.

Number of Science Teachers

have been made aware of the presence of the equipment?

 ▼

have physical access to the equipment?

 ▼

have been taught how to use SOME of the equipment?

 ▼

have been taught how to use ALL of the equipment?

 ▼

have used some of the equipment with students?

 ▼

have used some of the activities demonstrated in the summer training with students?

 ▼

Training

9. When did you receive your initial BioTeach three-day summer training?

- Summer 2006
- Summer 2005
- I never attended a three-day training

10. When did you attend the single follow-up day of training? This may have occurred in Framingham or in Kendall Square, Cambridge depending on the year you were trained.

- I never attended a follow-up day
- I attended a follow-up day in Cambridge (2006)
- I attended a follow-up day in Framingham (2007)
- I attended two follow-up days: one each in Cambridge and Framingham

Number of sections (classes) in each course.

	Did you teach this course?	Total number of students in this course	Number of sections of this course
Intro/General Biology-any ability level	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
AP Biology	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Biotechnology	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Human Anatomy/Physiology	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Forensics	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Marine Science	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Environmental Science	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Chemistry	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
AP Chemistry	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Other	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼

12. If you answered "Other", please name the course here.

13. Second term (January, 2007-present), did you teach any biotechnology skills or concepts? These can include what you learned from BioTeach, or anywhere else. For each course, tell us whether or not you taught it and, if you taught it, indicate the total number of students in the course and the total number of sections (classes) in each course.

	Did you teach this course?	Total number of students in this course	Number of sections of this course
Intro/General Biology-any ability level	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
AP Biology	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Biotechnology	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Human Anatomy/Physiology	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Forensics	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Marine Science	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼
Environmental Science	<input type="checkbox"/> ▼	<input type="text"/> ▼	<input type="checkbox"/> ▼

15. Which of the BioTeach PRE-LABS presented during training did you teach or will you teach your students this year? If you have not taught any of these specific pre-lab activities this year select "Did not teach any". (Those trained in summer 2005 did not receive all the pre-labs.)

- Did not teach any
- Basic Lab skills and Micropipette Challenge
- Entangled in the Web (for bacterial transformation)
- Mystery of the Crooked Cell (mechanisms of disease and sickle cell)
- Case of the Crown Jewels (DNA base sequences)

16. Which of the BioTeach LABS presented during summer training did you teach or will you teach your students this year? If you have not taught any of these specific labs, select "Did not teach any".

- Did not teach any
- DNA Fingerprinting (Crown Jewels)
- Isolation of Plasmid DNA through Mini Prep
- Transformation of E Coli Cells
- Mystery of the Crooked Cell
- Detection of ALU insertion by PCR

- Biotechnology concepts are too difficult for my students
- I can't see how to make time for it with MCAS pressures
- I teach classes that don't really relate to biotechnology
- I have other labs on these topics that I like better
- The equipment is too hard to use with my students
- Other

18. If you answered "Other" above, please tell us more in the space below.

20. In what level course(s) did you use this lab?

- AP
 Advanced/Honors
 Regular
 Vocational
 Other (please specify)

21. For the lab you selected, to what degree do you think it....

	Not at all	A little bit	Moderately	Quite a bit	Extensively
matched your primary goals for student learning?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
was interesting for most of your students?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
was at the appropriate level of difficulty for most of your students?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
was connected to the content of the rest of the course?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
will help students meet school/state graduation requirements?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. Teachers have many goals for using the BioTeach labs. They may want students to learn a technique, a science concept, how to understand and interpret results, or to see a real world application of science. For the lab you selected above, rate the importance of each of these goals on a scale from 1 to 5.

	1 Not important	2	3	4	5 Very important
Learn lab TECHNIQUES such as centrifuging, culturing bacteria, performing electrophoresis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn science CONCEPTS such as gene transfer or the structure of DNA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn how to INTERPRET data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn how science HELPS PEOPLE in the real world	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. Did you teach OTHER labs or topics incorporating biotechnology to your students this year?

- No
- Yes (briefly describe the lab or topic, and student level below)

25. The next three questions are about how the money, equipment, supplies, and training supplied by the program influences your teaching. Begin by telling us whether or not you taught students this year.

- I don't teach, so this is not applicable to me
- I do teach

Program Impact

26. Rate the impact of the three aspects of the BioTeach program listed below.

	Not at all	A little	Moderately	Quite a bit	Extensively
To what degree did any of the BioTeach TRAINING contribute to improvements in your TEACHING of science and/or biotechnology?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To what degree did the new EQUIPMENT purchased via BioTeach contribute to improvements in your TEACHING of science and/or biotechnology?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To what degree did the KITS or CONSUMABLE materials purchased via BioTeach contribute to your improved TEACHING of science and/or biotechnology?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To what degree did the new EQUIPMENT purchased via BioTeach contribute to improvements in the teaching of science and/or biotechnology in the DEPARTMENT?

To what degree did the KITS or other CONSUMABLE materials purchased via BioTeach contribute to improvements in the teaching of science and/or biotechnology in the DEPARTMENT?

Student Impact

The following questions are about your understanding of the program's broad impact on classes of students at different levels. (In the questions below, going from lowest to highest, "Regular" means introductory, basic, average classes; "Advanced" means a more difficult class, such as an honors class or a second year class; "AP" means a college-level course from the advanced placement program.) You may answer these even if you do not directly instruct students in a class. Select "NA" if you do not teach students at that level, or you have no contact at all with students and can't answer the question.

28. What impact has the program had on student AWARENESS of biotechnology?

	Not much	A little	Moderate	Quite a bit	Extensive	NA
Regular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. What impact has the program had on student UNDERSTANDING of the USES of science in the real world?

	Not much	A little	Moderate	Quite a bit	Extensive	NA
Regular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

30. What level of student INTEREST/ENGAGEMENT did you observe in the classes with biotechnology activities?

Not much	A little	Moderate	Quite a bit	Extensive	NA
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	Not much	A little	Moderate	Quite a bit	Extensive	NA
Regular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. To what degree has integrating biotechnology activities helped students learn about CAREERS in science industries?

	Not much	A little	Moderate	Quite a bit	Extensive	NA
Regular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

33. Any additional comments or clarifications to your answers about student impact?

each apparatus. If you did not teach students select "Did not teach students". If you did not teach the SKILL to students select "Not taught".

	Did not teach students	Not taught	Taught to 1 course	Taught to 2 courses	Taught to 3 courses	Taught to 4 courses	Taught to 5 courses	Taught to 6+ courses
Use a balance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a micropipette	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a serological pipette	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a vortex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practice glassware washing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practice sterile technique	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a centrifuge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a gel electrophoresis box	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

35. In how many courses LAST year (from August, 2005 to June, 2006) did you teach students how to use the following apparatus? A "course" is each class for which you have a separate preparation. You can have multiple sections or classrooms for each course. Please focus on courses. Select one answer for each apparatus. If you did not teach students select "Did not teach students". If you did not teach the SKILL to students select "Not taught".

	Did not teach students	Not taught	Taught to 1 course	Taught to 2 courses	Taught to 3 courses	Taught to 4 courses	Taught to 5 courses	Taught to 6+ courses
Use a balance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a micropipette	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a serological pipette	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a vortex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practice glassware washing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practice sterile technique	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a centrifuge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a gel electrophoresis box	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How to use the new equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to develop student ability to interpret data from labs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to refocus labs to emphasize core science concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to develop a biotechnology or forensics course for high school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn about careers in the sciences that might interest students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn about non-lab biotechnology activities such as computer simulations or videos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to relate biotechnology topics to real life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

37. If you selected "Other" above, explain what you or your faculty need in the space below.

39. Enter your mailing address below so that we may mail you the gift certificate.

Thank you very much for completing the questionnaire. The results will assist MassBioEd in strengthening the BioTeach program. Gift certificates will be mailed by June 15. If you do not receive one, please contact Jana Marcotte at TERC (617-547-0430) so we may fix the problem.

End of Questionnaire

You may now click "Done" to indicate you are finished.