



# Evaluation Report

## Workshop: Biology in a Box

### June 17-18, 2010

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# Workshop Evaluation Executive Summary

## Brief Synopsis of Event

This report is an evaluation of a NIMBioS Workshop entitled “Biology in a Box,” which took place at NIMBioS June 17-18, 2010. The purpose of the Workshop was to provide training on newly revised *Biology in a Box* units, which now incorporate mathematics essential to understanding biological concepts presented in the exercises. Organizers of the event were Susan Riechert (Department of Ecology and Evolutionary Biology, The University of Tennessee), Suzanne Lenhart (Department of Mathematics, The University of Tennessee, and Associate Director of Education, Outreach and Diversity, NIMBioS), and Sarah Duncan (Education and Outreach Coordinator, NIMBioS).

Science and math teacher pairs, as well as other school faculty/staff involved in or interested in *Biology in a Box*, were invited to attend the Workshop to learn new ways in which to use the units to increase student performance both in biology and mathematics. The Workshop also provided participants the opportunity to update boxes that were out of date or in need of replacement items. The Workshop comprised 20 participants (10 math teachers, 7 science teachers, and 1 principal, and 2 instructional coaches). Participants came from elementary, middle, and high schools. Participant education backgrounds included biology, chemistry, education, and mathematics.

## Evaluation Design

An electronic survey aligned to the following evaluation questions was designed by the NIMBioS Evaluation Coordinator with input from the NIMBioS Director and Deputy Director:

1. Were participants satisfied with the Workshop overall?
2. Did the meeting meet participant expectations?
3. Do participants feel they gained knowledge about how to incorporate *Biology in a Box* into their curriculum?
4. Do participants feel they gained new ideas for classroom activities?
5. What impact do participants feel the Workshop will have on their future lesson plans?
6. Were participants satisfied with the accommodations offered by NIMBioS?
7. What changes in accommodations, group format, and/or content would participants like to see at future similar meetings?

An electronic survey aligned to the evaluation questions was designed by the NIMBioS Evaluation Coordinator with input from the NIMBioS Director and Deputy Director. The final instrument was hosted online via the University of Tennessee’s online survey host mInterview. Links to the survey were sent to 20 registered Workshop participants on June 22, 2010. Reminder emails were sent to non-responding participants on June 29 and, July 6, 2010. By July 13, 2010, 18 of the registered participants had given their feedback, for a response rate of 90%.

An electronic demographic survey aligned to the reporting requirements of the National Science Foundation was designed by the NIMBioS Evaluation Coordinator with input from the NIMBioS Director, Associate Director of Education, Outreach and Diversity, and the Education and Outreach Coordinator.

The final instrument was hosted online via the University of Tennessee’s online survey host mrInterview. Links to the survey were sent to the 20 conference participants who had not previously attended a NIMBioS event on June 1, 2010. Reminder emails were sent to non-responding participants on June 8 and June 14, 2010. By June 21, 2010, 20 participants had filled out the survey for a response rate of 100%. Demographic questions regarding gender, race, and ethnicity, and disability status were optional (disability status is not reported in this evaluation report). All demographic information is confidential, and results are reported only in the aggregate. When feasible, the evaluator filled in missing demographic data from other sources (e.g. address, institution, field of study). The evaluator did not assume race, ethnicity, or disability status for any participant who did not report this information.

## Highlights of Results

- Overall satisfaction with the Workshop was high among respondents, all of whom indicated they either agreed or strongly agreed that the Workshop was very productive and met their expectations.
- The majority of respondents (89%) thought the presentations were useful, and all thought that the presenters were very knowledgeable about their presentation topics.
- 94% of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS Workshops to their colleagues.
- Overall, respondents reported being satisfied with the accommodations provided by NIMBioS.
- Respondents reported relatively high levels of learning, with an average of 98% of respondents agreeing that they learned more about the central topics of the Workshop.
- Most respondents said trying the activities out themselves was the Workshop's most useful aspect.
- 83% of respondents said they felt that participating in the Workshop gave them new ideas for classroom activities, saying that the Biology in Box would allow them to incorporate math and biology together, as well as create new learning experiences for students.
- All math teachers said they felt the Workshop helped them learn ways to incorporate biological examples in their math classrooms, and all but one biology teacher said the Workshop helped them learn ways to incorporate math examples in their biology classrooms.
- 100% of respondents agreed that the format of the Workshop was very effective.
- 100% of respondents said they felt that the exchange of ideas that took place during the Workshop would (or potentially would) initiate and/or influence their future lesson plans.

## Conclusions and Recommendations

Overall, the Workshop was seen as successful in the eyes of the respondents. Survey respondents were satisfied with the meeting, indicating that it was a productive experience that met their expectations. Several indicated that the Workshop organizers did a great job, and that the Workshop was well-organized. Respondents were also satisfied with the accommodations offered by NIMBioS.

An average of 98% of respondents agreed that they learned more about the central topics of the Workshop. While the majority of respondents agreed that they had a better understanding of the main topics, some respondents said they either did not gain understanding, or felt “neutral” or about the amount of understanding they gained regarding using mathematics to understand biological phenomena.

Most respondents said they felt that participating in the Workshop gave them new ideas for classroom activities, saying that the Biology in Box activities would allow them to incorporate math and biology together, as well as create new learning experiences for students. All math teachers said they felt the Workshop helped them learn ways to incorporate biological examples in their math classrooms, and all but one biology teacher said the Workshop helped them learn ways to incorporate math examples in their biology classrooms. Many respondents said as well that the exchange of ideas that took place during the Workshop would definitely influence their future lesson plans.

Several suggestions for improvement of future Workshops were offered by participants, including making the Workshop longer, spending more time using and becoming more knowledgeable about the boxes, and providing separate sessions for the current box users and those new to the program. Other suggestions from respondents included aggregating teacher presentations by grade levels taught, and having healthier food options.

Based on analysis of participant response data, the recommendations for future Workshops are as follows:

- Consider expanding future similar Workshops to two days to allow participants more time to become familiar with the activities and lesson plans provided through the program.
- Consider adding breakout groups at the beginning of the Workshop to separate new users from those who are already in the Biology in a Box program. Provide new users with an orientation to the boxes during this time, and allow current users to discuss how they are using the boxes, any issues they are having with the lesson plans, etc.
- Consider the idea of allowing participants to aggregate by grade level for their presentations.
- NIMBioS should look into offering more healthy food choices to participant

# Biology in a Box Workshop Evaluation Report

## Background

### Introduction

This report is an evaluation of a NIMBioS Workshop entitled “Biology in a Box,” which took place at NIMBioS June 17-18, 2010. The purpose of the Workshop was to provide training on newly revised *Biology in a Box* units, which now incorporate mathematics essential to understanding biological concepts presented in the exercises. Organizers of the event were Susan Riechert (Department of Ecology and Evolutionary Biology, The University of Tennessee), Suzanne Lenhart (Department of Mathematics, The University of Tennessee, and Associate Director of Education, Outreach and Diversity, NIMBioS), and Sarah Duncan (Education and Outreach Coordinator, NIMBioS).

Science and math teacher pairs, as well as other school faculty/staff involved in or interested in Biology in a Box, were invited to attend the Workshop to learn new ways in which to use the units to increase student performance both in biology and mathematics. The Workshop also provided participants the opportunity to update boxes that were out of date or in need of replacement items. The Workshop comprised 20 participants (10 math teachers, 7 science teachers, and 1 principal, and 2 instructional coaches). Participants came from elementary, middle, and high schools. Participant education backgrounds included biology, chemistry, education, and mathematics.

### Program Background

Biology in a Box is a fun and challenging way for entire schools to enhance their life sciences curriculum at all grade levels, and to encourage student interest in STEM (science, technology, engineering, and mathematics) disciplines. The program employs a hands-on, inquiry-based approach to teach the wonders of the living world, as well as introducing the scientific methods and math skills used to understand that world.

Each thematic unit has exercises that are designed to enrich science curriculum content for students from the elementary grades through high school. The goal of each unit is to pique the interest of even low-ability students on a particular biological theme. The more advanced activities in a thematic unit, furthermore, have been designed as curriculum enrichment for very bright students who need a challenge.

The Biology in a Box program is especially valuable to teachers in schools that have limited resources for extra materials. The materials needed for completion of the exercises, presented in each thematic trunk, are totally reusable and are generally not commercially available. It is also an excellent program for schools with a limited science faculty, since no prior knowledge of the subject matter is needed for a teacher to explore a box theme with his or her students.



## Participant Demographics

Program participants were elementary school faculty/staff (10%), high school faculty/staff (50%), and middle school faculty/staff (40%), who came from 14 institutions across the United States. Four different states were represented.

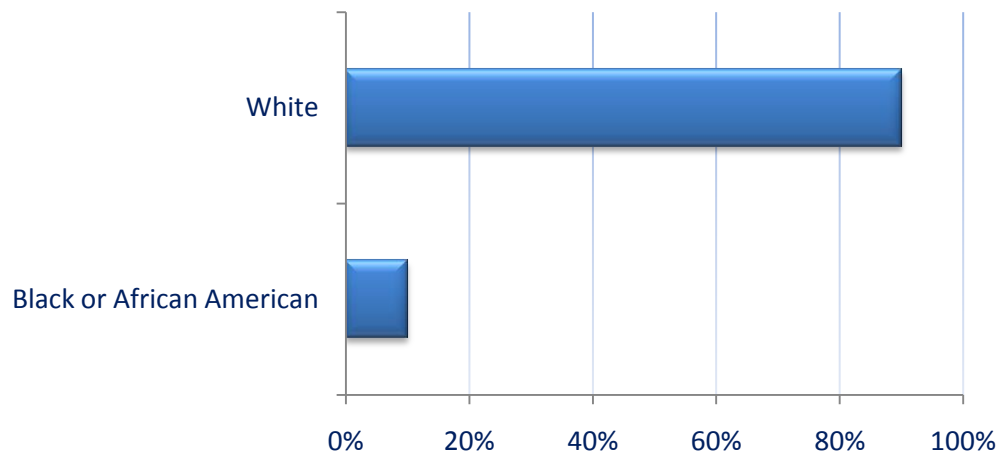
Primary fields of study for the 20 participants included biological/biomedical sciences, chemistry, education, and mathematics (Table 1).

**Table 1. Participant fields of study and areas of concentration**

Field of Study	Concentration	# Participants
Biological/Biomedical Sciences	Biochemistry	1
	Biology/Biological Sciences, General	2
Chemistry	Analytical	1
Education	Education, General	1
	Educational Administration & Supervision	2
	Educational Leadership	1
	Elementary Education	4
	Secondary Education	2
	Special Education	1
Mathematics	Algebra	3
	Applied Mathematics	1
	Math/Statistics, Other	1

The 17 females and 3 males (none of whom self-identified as being of Hispanic/Latino ethnicity) mostly self-identified racially as white (Figure 1).

**Figure 1. Racial composition of program participants (n =20)**



## Evaluation Design

### Evaluation Questions

The evaluation of the Workshop was both formative and summative in nature, in that the data collected from participants was intended to both gain feedback from participants about the quality of the current Workshop and also to inform future meetings. The evaluation framework was guided by Kirkpatrick's Four Levels of Evaluation model for training and learning programs (Kirkpatrick, 1994<sup>1</sup>). Several questions constituted the foundation for the evaluation:

1. Were participants satisfied with the Workshop overall?
2. Did the meeting meet participant expectations?
3. Do participants feel they gained knowledge about how to incorporate Biology in a Box into their curriculum?
4. Do participants feel they gained new ideas for classroom activities?
5. What impact do participants feel the Workshop will have on their future lesson plans?
6. Were participants satisfied with the accommodations offered by NIMBioS?
7. What changes in accommodations, group format, and/or content would participants like to see at future similar meetings?

### Evaluation Procedures

An electronic survey aligned to the evaluation questions was designed by the NIMBioS Evaluation Coordinator with input from the NIMBioS Director and Deputy Director. The final instrument was hosted online via the University of Tennessee's online survey host mrInterview. Links to the survey were sent to 20 registered Workshop participants on June 22, 2010. Reminder emails were sent to non-responding participants on June 29 and, July 6, 2010. By July 13, 2010, 18 of the registered participants had given their feedback, for a response rate of 90%.

An electronic demographic survey aligned to the reporting requirements of the National Science Foundation was designed by the NIMBioS Evaluation Coordinator with input from the NIMBioS Director, Associate Director of Education, Outreach and Diversity, and the Education and Outreach Coordinator. The final instrument was hosted online via the University of Tennessee's online survey host mrInterview. Links to the survey were sent to the 20 conference participants who had not previously attended a NIMBioS event on June 1, 2010. Reminder emails were sent to non-responding participants on June 8 and June 14, 2010. By June 21, 2010, 20 participants had filled out the survey for a response rate of 100%. Demographic questions regarding gender, race, and ethnicity, and disability status were optional (disability status is not reported in this evaluation report). All demographic information is confidential, and results are reported only in the aggregate. When feasible, the evaluator filled in missing demographic data from other sources (e.g. address, institution, field of study). The evaluator did not assume race, ethnicity, or disability status for any participant who did not report this information.

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<sup>1</sup> From Kirkpatrick, D.L. (1994). *Evaluating Training Programs: The Four Levels*. San Francisco, CA: Berrett-Koehler.

## Data Analysis

Data from the electronic survey included both forced-response and supply-item questions. All data were downloaded from the online survey host into the statistical software package SPSS for analysis. Quantitative data were analyzed using SPSS, while qualitative data were analyzed in SPSS Text Analysis for Surveys. Qualitative responses were categorized by question and analyzed for trends.

## Findings

### Overall Satisfaction

Overall satisfaction with the Workshop was high among respondents, all of whom indicated they either agreed or strongly agreed that the Workshop was very productive and met their expectations. Some general participant comments:

*“Thank you so much for allowing me to attend such a wonderful Workshop. I am excited about teaching in the fall and can't wait to incorporate many of the activities to pique the interest of my students.”*

*“I can't wait to use these activities. I plan on using one of them the first day of school.”*

*“I enjoyed the Workshop tremendously. I am excited about introducing the new activities to my teachers. I brought a teacher that had never used the boxes; she was very impressed and please she was able to attend. Thank you for a job well done!”*

*“This was one of the most organized Workshops I have attended! I thought it was something that I can really “use” in my classroom.”*

The majority of respondents (89%) thought the presentations were useful, and all thought that the presenters were very knowledgeable about their presentation topics. Most (89%) agreed the group discussions were useful as well. All of the respondents either agreed or strongly agreed that they left the Workshop with a better appreciation of the interface between math and biology. Finally, 94% said they would recommend participating in NIMBioS Workshops to their colleagues (Table 2).

**Table 2. Participant satisfaction with various aspects of the Workshop**

	<i>n</i>	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I feel the Workshop was very productive.	18	78%*	22%	0%	0%	0%
The Workshop met my expectations.	18	67%	33%	0%	0%	0%
The presenters were very knowledgeable about their topics.	18	89%	11%	0%	0%	0%
The presentations were useful.	18	67%	22%	11%	0%	0%
The group discussions were useful.	18	50%	39%	11%	0%	0%
I have a better appreciation of the interface between math and biology.	18	61%	39%	0%	0%	0%
I would recommend participating in NIMBioS Workshops to my colleagues.	18	83%	11%	6%	0%	0%

\* Note: Percentages in tables may not add to 100% due to rounding

### ***Satisfaction with Accommodations***

The majority of participants reported being satisfied with the comfort and resources provided by NIMBioS, as well as the quality of meals provided (Table 3). One participant’s comment about the overall accommodations:

*“Accommodations were excellent.”*

*“...The meals were exceptional!”*

Two participants did offer suggestions for improving meals:

*“[I w]ould like lower carbohydrate choices.”*

*“The breakfast was good; lunch would have been a little better if you had offered a variety of chips and/or some mixed fruit.”*

**Table 3. Participant satisfaction with Workshop accommodations**

Please indicate your level of satisfaction with the Workshop accommodations:

	<i>n</i>	Very satisfied	Satisfied	Neutral	Dissatisfied	Strongly dissatisfied	Not applicable
Comfort of the facility	18	78%	22%	0%	0%	0%	0%
Resources of the facility	18	83%	17%	0%	0%	0%	0%
Quality of meals	18	61%	11%	6%	22%	0%	0%
Quality of drinks and snacks provided	18	56%	17%	22%	6%	0%	0%

### Workshop Content and Format

#### Participant Learning

Respondents reported high levels of learning, with an average of 98% of respondents agreeing that they learned more about the central topics of the Workshop. While the majority of respondents agreed that they had a better understanding of the main topics, some respondents said they either did not gain understanding, or felt “neutral” or about the amount of understanding they gained regarding using mathematics to understand biological phenomena (Table 4). The respondent who disagreed that he/she had a better appreciation of using mathematics to understand biological phenomena had this to say:

*“Some of the teacher presenters did not include the mathematics piece as instructed.”*

**Table 4. Participant learning in areas related to the Workshop’s topic**

As a result of participating in this Workshop, I have a better understanding of:	<i>n</i>	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The interface between math and biology	18	61%	39%	0%	0%	0%
Using mathematics to understand biological phenomena	18	50%	39%	6%	6%	0%
The curriculum of the Biology in a Box program	18	72%	28%	0%	0%	0%
How to incorporate new curricula at the interface of math and biology	18	72%	28%	0%	0%	0%
How to adapt existing curricula to integrate math and biology	18	72%	28%	0%	0%	0%

Fifteen of the 18 respondents said they felt that participating in the Workshop gave them new ideas for classroom activities, saying that the Biology in a Box program would allow them to incorporate math and biology together, as well as create new learning experiences for students:

*“As someone who is responsible for professional development for both math and science, it gives me ways to incorporate both.”*

*“My goal is to provide a laboratory experience for each content standard that I teach. I was having a hard time coming up with some for the biology strands as the materials required were next to impossible to create and or find. Biology in a Box has provided the needed materials for me to be able to do this. I am so excited about this coming school year and the learning opportunities that I will be able to bring to my students as a result of attending this Workshop.”*

*“I found ways to incorporate these activities into my Math R.T.I. centers!”*

*“I will actually be incorporating the biology boxes during the countywide transition program for ninth grade students. I have introduced the boxes to those teachers that will be participating in the program this summer. They are truly excited about what they will be able to do with the kits.”*

*“I’m brand new to Biology in a Box, so the presentations made the curriculum accessible and understandable. I was able to see which units would naturally fit into my curriculum and which ones I would have to work on finding a place for. I loved the acorn cache idea. Also, I like how many of the activities give the students graphing practice. I’d like to use some of the units related to measurement, but I’d have to adjust my current plan. But it would be worth it. I’d really like to try and find a way to set up a math and science block or something so that the high school science teachers and I could work across class times to teach these units together.”*

All math teachers said they felt the Workshop helped them learn ways to incorporate biological examples in their math classrooms, and all but one biology teacher said the Workshop helped them learn ways to incorporate math examples in their biology classrooms.

*“While I teach science my department has regular collaborative meetings to help us pull in curriculum from all subjects into our classes. I learned many ways to ask the math teacher for help in supplementing what I am doing in my science classroom.” (Biology Teacher comment)*

*“I am so excited about the math additions to the Biology in a Box. There are some great activities and I know they will help my students in both math and science.” (Math Teacher comment)*

Fifteen of the 18 respondents said the exchange of ideas that took place during the Workshop would influence their future lesson plans, while three said it was possible the ideas would influence their plans.

*“I eagerly await the math/biology connections for the lower elementary grades. But, again, hearing others share got my mind going in how to implement their novel perspectives and ideas for presenting materials.”*

*"I will incorporate hands-on activities and group lessons - the lessons in the Biology in a Box are very useful and also include very thorough instructions as well as excellent PowerPoints."*

### **Most Useful Aspects**

All respondents felt the Workshop format was effective: however, one respondent suggested a change to future Workshops:

*"As the program expands, it would be helpful to separate new comers from old timers."*

Several respondents felt the most useful aspect of the Workshop was trying the activities out themselves:

*[The most useful aspect was..]*

*"Physically getting into the boxes and using the new math sections."*

*"Examining the boxes and getting hands on experience for myself so that any questions I had could be addressed to the group as a whole."*

*"...getting a better understanding of the boxes and how they can help teach my students. I enjoyed getting to try some of the activities and see how they worked!"*

*"Demonstrations for the Workshop participants to use the materials in the box."*

*"Spending time looking at a unit and presenting it to the other Workshop members".*

Other respondents felt the ability to collaborate with other teachers was the most useful aspect of the Workshop:

*"I believe that the entire Workshop was useful. Teachers were given the opportunity to share with others from different schools, districts, and states. We were able to compare and contrast the standards as well as the levels of education being taught."*

*[The most useful aspect was..]*

*"Idea exchange. Networking. How to ensure a math/science connection."*

*"Having teachers together to learn from each others use of the boxes."*

*"The collaboration among the educators and the sharing of the activities in the boxes especially the new activities."*

### **Communication**

Seventeen of the 18 survey respondents said they were either "very satisfied" or "satisfied" with the opportunities provided during Workshop presentations and discussions to ask questions and/or make comments, while one indicated feeling "neutral." One participant's comment:

*"I felt that any ideas I shared were openly listened to and that communication among all was a positive experience. I loved that we were able to all share ideas as some things that others shared were things I would have never thought of on my own. I welcomed the opportunity to learn not only from the NIMBioS facilitators but from all of the participants as well."*

One respondent gave a suggestion for improving communications among participants:

*"What might be neat is if we could set up a wiki for the Workshop participants continue the discussions started in the Workshop, stay in touch, and keep sharing ideas. It could also be open for other Biology in a Box users to post about how they use each unit in their classroom."*

### **Suggestions for Future Workshop Meetings**

Respondents were asked several questions soliciting suggestions for future Workshop meetings. One common request was to make the Workshop longer:

*"Make it a full two days so that we would have time to go through more activities in the boxes as a group."*

*"Maybe longer - perhaps a two-day Workshop to become familiar with many of the topics."*

*"Would love to have more time for the Workshop to learn more ideas from lessons taught by teachers."*

Other respondents would have liked to have spent more time using and becoming more knowledgeable about the boxes themselves:

*"I would like to spend time going through each box, looking at the activities, and trying to align things with my curriculum."*

*"Allow participants to begin using the boxes from day 1. This way they are with the developers and can ask questions."*

Two respondents felt like some separate sessions for the current box users and those new to the program would have been beneficial:

*"Have some separate sessions for 'old timers.' It might save time since we are already familiar with inventory, administration, and such."*

*"For those who are new to Biology in a Box, a brief demonstration/explanation of each box."*

Other suggestions were to aggregate teacher presentations by grade levels taught:

*"If I had to change anything I would have all primary, middle, and high school teachers work together in their presentations. This would allow time for more creativity at their grade level."*



## Conclusions and Recommendations

Overall, the Workshop was seen as successful in the eyes of the respondents. Survey respondents were satisfied with the meeting, indicating that it was a productive experience that met their expectations. Several indicated that the Workshop organizers did a great job, and that the Workshop was well-organized. Respondents were also satisfied with the accommodations offered by NIMBioS.

An average of 98% of respondents agreed that they learned more about the central topics of the Workshop. While the majority of respondents agreed that they had a better understanding of the main topics, some respondents said they either did not gain understanding, or felt “neutral” or about the amount of understanding they gained regarding using mathematics to understand biological phenomena.

Most respondents said they felt that participating in the Workshop gave them new ideas for classroom activities, saying that the Biology in a Box activities would allow them to incorporate math and biology together, as well as create new learning experiences for students. All math teachers said they felt the Workshop helped them learn ways to incorporate biological examples in their math classrooms, and all but one biology teacher said the Workshop helped them learn ways to incorporate math examples in their biology classrooms. Many respondents said as well that the exchange of ideas that took place during the Workshop would definitely influence their future lesson plans.

Several suggestions for improvement of future Workshops were offered by participants, including making the Workshop longer, spending more time using and becoming more knowledgeable about the boxes, and providing separate sessions for the current box users and those new to the program. Other suggestions from respondents included aggregating teacher presentations by grade levels taught, and having healthier food options.

Based on analysis of participant response data, the recommendations for future Workshops are as follows:

- Consider expanding future similar Workshops to two days to allow participants more time to become familiar with the activities and lesson plans provided through the program.
- Consider adding breakout groups at the beginning of the Workshop to separate new users from those who are already in the Biology in a Box program. Provide new users with an orientation to the boxes during this time, and allow current users to discuss how they are using the boxes, any issues they are having with the lesson plans, etc.
- Consider the idea of allowing participants to aggregate by grade level for their presentations.
- NIMBioS should look into offering more healthy food choices to participant

## **Appendix A**

### *List of Participants*

## Participants

Last name	First name	Institution
Davis	Paula	Hamblen County Department of Education
Day	Kim	Rutherford County Schools
Foran	Christina	Tennessee School for the Deaf
Fowler	Lynette	Jefferson County School System
Fox	Janice	Elizabethton High School
Geouge	Stephanie	Hardeman County Schools
Grove	Robin	Tennessee School for the Deaf
Hawkins	Susan	Avery County High School
Jensen	Jennifer	John Sevier Middle School
Knipp	Tammy	Jackson Madison County School System
McFarlane	Latrelle	Creekside High School
Nolan	Zachary	Bolivar Elementary School
Powell	William	Middlesboro Middle School
Rainwater	Kathe	Jefferson County School System
Rogers	Angela	Maury Middle School
Rusell	Penny	Rutherford County Schools
Scott	Alicia	Florida Agricultural and Mechanical University
Watkins	Liesel	Middlesboro Middle School
Wheeler	Ralph	Elizabethton High School
Winters	Neva	Avery County High School

## Appendix B

### *Biology in a Box Workshop Survey*

## Biology in a Box Survey

Thank you for taking a moment to complete this survey. Your responses will be used to improve the Workshops hosted by the National Institute for Mathematical and Biological Synthesis. Information supplied on the survey will be confidential, and results will be reported only in the aggregate.

### Workshop Evaluation

Which of the following subjects do you mainly teach?

Math

Science

Please check the appropriate box to indicate your level of agreement with the following statements about this Workshop: (Very satisfied, Satisfied, Neutral, Dissatisfied, Very dissatisfied)

I feel the Workshop was very productive.

The Workshop met my expectations.

The presenters were very knowledgeable about their topics.

The presentations were useful.

The group discussions were useful.

I would recommend participating in NIMBioS Workshops to my colleagues.

I have a better appreciation of the interface between math and biology.

Please check the appropriate box to indicate your level of agreement with the following statements. As a result of participating in this Workshop, I have a better understanding of:

(Strongly agree, Agree, Neutral, Disagree, Strongly disagree)

Using mathematics to understand biological phenomena.

The curriculum of the Biology in a Box program.

How to incorporate new curricula at the interface of mathematics and biology.

How to adapt existing curricula to integrate mathematics and biology.

Do you feel attending the Workshop helped you learn ways to incorporate biological examples in your math classroom? (math teachers only)

Yes

No

Comments:

Do you feel attending the Workshop helped you learn ways to incorporate mathematical examples in your biology classroom? (biology teachers only)

Yes

No

Comments:

Do you feel that the exchange of ideas that took place during the Workshop will influence your future lesson plans? Please explain:

Did the Workshop give you new ideas for classroom activities? Please explain:

What do you feel was the most useful aspect of the Workshop?

What would you have changed about the Workshop?

How do you feel about the format of the Workshop?

This was a very effective format for achieving our goals

This was not a very effective format for achieving our goals ->

The Workshop format would have been more effective if:

Please indicate your level of satisfaction with the Workshop accommodations:  
(Very satisfied, Satisfied, Neutral, Dissatisfied, Very dissatisfied, Not applicable)

Comfort of the facility in which the Workshop took place

Resources of the facility in which the Workshop took place

Quality of meals

Quality of drinks and snacks provided

Please indicate any changes NIMBioS can make to improve the resources and/or accommodations available to Workshop participants:

### **Communications Evaluation**

How satisfied were you with the opportunities provided during Workshop presentations and discussions to ask questions and/or make comments?

Very satisfied

Satisfied

Neutral

Dissatisfied

Very Dissatisfied

Please indicate any suggestions you have for facilitating communication among participants during the Workshop:

Please provide any additional comments about your overall experience with the Workshop:

## Appendix C

### *Open-ended Survey Responses*

**Do you feel attending the Workshop helped you learn ways to incorporate biological examples in your math classroom? (n=5)**

This was one of the most organized Workshops I have attended! I thought it was something that I can really "use" in my classroom.

As the program expands, it would be helpful to separate new comers from old timers.

I think this Workshop would also be great for new teachers entering the profession. This would provide them an opportunity to be more creative and equipped to try new things.

I'd like to be able to collaborate with the high school science teachers so that the activities in these units can span my class time and theirs. , I'm brand new to Biology in a Box, so I got a good overview of the curriculum, and the NIMBioS staff shared their enthusiasm and research perspective. I'm excited about all the ideas I got for using Biology in a Box in my classroom.

I am so excited about the math additions to the Biology in a Box. There are some great activities and I know they will help my students in both math and science.

**Do you feel attending the Workshop helped you learn ways to incorporate mathematical examples in your biology classroom? (n=4)**

While I teach science my department has regular collaborative meetings to help us pull in curriculum from all subjects into our classes. I learned many ways to ask the math teacher for help in supplementing what I am doing in my science classroom.

Some of the teacher presenters did not include the mathematics piece as instructed.

I will begin a science/math club next year and our primary use will come from B in a Box

I enjoyed the Workshop tremendously. I am excited about introducing the new activities to my teachers. I brought a teacher that had never used the boxes; she was very impressed and please she was able to attend. Thank you for a job well done!

**Do you feel that the exchange of ideas that took place during the Workshop will influence your future lesson plans? (n=9)**

Other than the teacher presenters who did not properly demonstrate the math piece.

The most helpful idea aside from using the box as "it is intended to use it" was another teacher who has experience with the boxes explained how she would use them for other curriculum content standards and how she could manipulate the materials to be used in other ways to touch on other strands.



It was good to hear how regular education teachers approach the material and what they expect from their students, and to find out that my special education perspective doesn't differ so much. Also, the discussion about how this fit with standards and tests was beneficial.

I eagerly await the math/biology connections for the lower elementary grades. But, again, hearing others share got my mind going in how to implement their novel perspectives and ideas for presenting materials.

I will incorporate hands-on activities and group lessons - the lessons in the Biology in a Box are very useful and also include very thorough instructions as well as excellent PowerPoints.

Having teachers share what they would do with each lesson was very helpful and provided new ideas.

I want to use the activities.

Collaboration is the best practice for birthing new ideas.

Allowing the participants to present the different boxes gave individuals the opportunity to replay their normal way of introducing the lesson while viewing an alternative.

### **Did the Workshop give you new ideas for classroom activities? (n=9)**

As someone who is responsible for professional development for both math and science, it gives me ways to incorporate both.

My goal is to provide a laboratory experience for each content standard that I teach. I was having a hard time coming up with some for the biology strands as the materials required were next to impossible to create and or find. Biology in a Box has provided the needed materials for me to be able to do this. I am so excited about this coming school year and the learning opportunities that I will be able to bring to my students as a result of attending this Workshop.

I found ways to incorporate these activities into my Math R.T.I. centers!

I can't wait to use these activities. I plan on using one of them the first day of school.

I'm brand new to Biology in a Box, so the presentations made the curriculum accessible and understandable. I was able to see which units would naturally fit into my curriculum and which ones I would have to work on finding a place for., I loved the acorn cache idea. Also, I like how many of the activities give the students graphing practice. I'd like to use some of the units related to measurement, but I'd have to adjust my current plan. But it would be worth it. , I'd really like to try and find a way to set up a math and science block or something so that the high school science teachers and I could work across class times to teach these units together.

Incorporate a stronger math connection. Also, actually doing some activities made them much easier to understand, so now I will be quicker to implement.

I will be teaching a 90 minute block class and many of the math activities are very appropriate and relevant to middle school students

Some of the activities were similar to those I have used in the past. The activities from the Workshop are planned without consumables, which is nice.

I will actually be incorporating the biology boxes during the countywide transition program for ninth grade students. I have introduced the boxes to those teachers that will be participating in the program this summer. They are truly excited about what they will be able to do with the kits.

**What do you feel was the most useful aspect of the Workshop? (n=17)**

Idea exchange. Networking. How to ensure a math/science connection.

Having teachers together to learn from each others use of the boxes.

The collaboration among the educators and the sharing of the activities in the boxes especially the new activities.

I believe that the entire Workshop was useful. Teachers were given the opportunity to share with others from different schools, districts, and states. We were able to compare and contrast the standards as well as the levels of education being taught.

Hearing other educators share how they will use it and testify that it does work

Doing some of the activities, as led by the NIMBioS staff, was the most memorable activity. But the group presentations also helped give a good overview of the curriculum.

Strategies for the classroom presented by others attending.

Trying the activity for myself.

the hands-on activities that we did

Physically getting into the boxes and using the new math sections.

Examining the boxes and getting hands on experience for myself so that any questions I had could be addressed to the group as a whole.

For me the most useful aspect was getting a better understanding of the boxes and how they can help teach my students. I enjoyed getting to try some of the activities and see how they worked!

Demonstrations for the Workshop participants to use the materials in the box.

Actually being allowed to use the boxes while with the developers

The hands on presentations allowed me to see how the activities in the boxes work.

Spending time looking at a unit and presenting it to the other Workshop members.

The time spent on our own, going through a specific box.

### **What would you change about the Workshop? (n=12)**

For those who are new to Biology in a Box, a brief demonstration/explanation of each box would be very helpful.

If I had to change any thing I would have all primary, middle, and high school teachers work together in their presentations. This would allow time for more creativity at their grade level.

More organization to presentations.

Make it a full two days so that we would have time to go through more activities in the boxes as a group.

Maybe longer - perhaps a two-day Workshop to become familiar with many of the topics.

Would love to have more time for the Workshop to learn more ideas from lessons taught by teachers.

Have some separate sessions for 'old timers.' It might save time since we are already familiar with inventory, administration, and such.

I would like to spend time going through each box, looking at the activities, and trying to align things with my curriculum.

Allow participants to begin using the boxes from day 1. This way they are with the developers and can ask questions

Lower carbohydrate food choices.

The "sharing" time was a little long.

I thought the Workshop was wonderful!

**The Workshop would have been more effective if: (n=0)**

**Please indicate any changes NIMBioS can make to improve the resources and/or accommodations available to Workshop participants: (n=4)**

Would like lower carbohydrate choices.

Accommodations were excellent.

The breakfast was good; lunch would have been a little better if you had offered a variety of chips and/or some mixed fruit.

I wasn't quite sure where to park when I got there. The meals were exceptional!

**Please indicate any suggestions you have for facilitating communication among participants during the Workshop: (n=3)**

I felt that any ideas I shared were openly listened to and that communication among all was a positive experience. I loved that we were able to all share ideas as some things that others shared were things I would have never thought of on my own. I welcomed the opportunity to learn not only from the NIMBioS facilitators but from all of the participants as well.

What might be neat is if we could set up a wiki for the Workshop participants continue the discussions started in the Workshop, stay in touch, and keep sharing ideas. It could also be open for other Biology in a Box users to post about how they use each unit in their classroom.

I would like to have more time exploring the boxes and less time presenting.

**Please use this space for any additional comments: (n=6)**

New to the program. I have not used to boxes in class yet.

I am actually a district office administrator from a high school background.

I think I would have brought my laptop if I had known there were connections. That information might be something that you send out before the next Workshop. I am disappointed that we have a "box keeper" in our system and we have not known about this....I have emailed her to obtain some of the boxes so that we may get started right away with the new school year. The math teacher that came with me is very willing to participate so I see this as a great way to combine our disciplines.

I am a principal, so do not teach classes each day. However, I do assist in 'science days' with students as we share science demonstrations. My plans this coming year are to assist in the science lab with

Biology in a Box sessions.

Thank you so much for allowing me to attend such a wonderful Workshop. I am excited about teaching in the fall and can't wait to incorporate many of the activities to pique the interest of my students.

I am an instructional coach and serve 11 elementary schools. My position has given me an opportunity to share the boxes in all schools. The teachers with whom I have shared the boxes have found them to be very valuable. The additional math activities are going to be well received. Thank you for all your work to make students' educational experience not only relevant but fun!