# Academic Program Assessment Report

**Assessment** is a term commonly used to encompass the process of gathering and using evidence to guide improvements.

SACSCOC requires that an institution "identifies expected outcomes, assesses the extent to which it achieves these outcomes, and provides evidence of seeking improvement based on analysis of the results".

**Academic Program**

Biology, B.S.

**Submission Year**

2019-2020

*Ex. If the report you are submitting is due October 1, 2019, choose 2019-2020.*

**Assessment Coordinator Name**

Elizabeth McDonald

**Enter Assessment Coordinator Email**

emcdonald@lander.edu

*If more than one coordinator, please choose one for emails to be sent to.*

## Program Goal

## Goal

### Goal 1

**Program Goals** are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

**Every Academic Program must include one goal on Program Productivity data for the South Carolina Commission on Higher Education. Information pertaining to this goal was sent by the Director of Institutional Effectiveness.**

Students will demonstrate an understanding of evolution, structure and function relationships, information flow and exchange, pathways and transformations of energy and matter, and the interconnectedness within and among living systems.

**Pillar of Success Supported**

- ⦿ High-Demand, Market-Driven Programs
- ○ Selective, Competitive Recruitment and Enrollment of Ambitious and Talented Students
- ○ Robust Student Experience
- ○ Graduates Who Are Gainfully Employed or Admitted to Graduate School
- ○ Advancement Activities Leveraged to Further the University's Mission
- ○ Engaged and Supportive Alumni
- ○ Financially Stable and Operationally Efficient
- ○ Facilities Positioned for Growth and Efficient Utilization

○ Employer of Choice

○ Highly-Valued Community Partner

*Choose the Pillar of Success that your goal best aligns with.*

# Outcomes

## Outcome 1

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of selected questions about evolution on the Major Field Test (MFT) in biology on which the percent of Lander students answering correctly was as high or higher than the national percent of students answering correctly.

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

The percent of Lander students answering the question correctly was as high or higher than the percent of students answering the question correctly nationally on 60% of the questions

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on at least 50% but fewer than 60% of the questions

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on fewer than 50% of the questions

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Major Field Test in Biology

*Tools that allow us to measure or demonstrate the*

**Frequency of Assessment**

*extent to which outcomes have been achieved (ex. Capstone assignment).*

Every spring semester to students enrolled in BIOL 499

**Data Collected for this Timeframe (Results)**

75%

**Score (Met=3, Partially Met=2, Not Met=1)**

3

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Comments/Narrative**

2018-2019
The percent of Lander students answering questions about evolution on the MFT was as high as or higher than the national average on 75% of the questions. Students easily met expectations for this outcome. Most of the students taking the MFT this year had recently completed the BIOL 303 course (Evolution, required for all biology majors). Additionally, students taking the MFT in the future will have had the benefit of a revised introductory biology curriculum (now BIOL 111/112) and required diversity course (BIOL 213 or BIOL 214) which cover topics in basic evolutionary biology.

2017-2018
The percent of Lander students answering questions about evolution on the MFT was as high as or higher than the national average on 80% of the questions. The success is largely due to recent curriculum revision within the biology department. A course in evolution (BIOL 303) is now required for all biology majors (and most of the students taking the MFT this year had just completed this course). Additionally, students taking the MFT in the future will have had the benefit of a revised introductory biology curriculum (now BIOL 111/112) which now includes more class time dedicated to learning the basic principles of evolution.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

An “Item Information Report” of the MFT from the ETS, which can be purchased for $350 per year is required to sustain results.  Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
The item information report will allow biology students at Lander to be compared to students nationally specifically for questions relating to evolution. The biology department will use this data to determine which specific areas of the program need improvement. Additionally, results from questions related to evolution will be shared with the relevant instructors so that those faculty members can focus instruction in specific areas needing improvement.

## Outcome 2

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of selected questions about structure and function relationship on the Major Field Test (MFT) in biology on which the percent of Lander students answering correctly was as high or higher than the national average percent of students answering correctly.

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on 60% or more of the questions

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on at least 50% but fewer than 60% of the questions

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on fewer than 50% of the questions

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Major Field Test in Biology

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every spring semester to students enrolled in BIOL 499

**Data Collected for this Timeframe (Results)**

57.9%

*If this is a new outcome and no data has been collected, you should explain when data will be*

**Score (Met=3, Partially Met=2, Not Met=1)**

2

*available for entry.*

**Comments/Narrative**

2018-2019
The percent of Lander students answering questions about the relationship between structure and function on the MFT was as high as or higher than the national average on 57.9% of the questions. Students partially met expectations in this category. Although this will continue to be a difficult to assess outcome, students assessed in the 2018-2019 academic year did markedly better than in 2017-2018 (increase of more than 10%). Data collected over the next few years will be used to detect trends and help faculty to determine whether this is a meaningful increase.

2017-2018
The percent of Lander students answering questions about the relationship between structure and function on the MFT was as high as or higher than the national average on 46.2% of the questions. Students did not meet expectations in this category. Outcome 2 is an especially difficult category in which to meet expectations because questions on the MFT about this topic are specific to individual systems. For example, questions might relate to vertebrate anatomy, but a particular student has taken a course in plant anatomy instead. Thus, the student may understand the underlying principle about the relationship between structure and function in biological systems, but he/she not be able to answer the specific question correctly. However, the curriculum revision should ensure that students will be exposed to multiple systems covered on the MFT at some point in their coursework. Cell structure is covered in detail in BIOL 112, a part of the newly revised introductory curriculum which all students are required to take. Additionally, all students are required to take either botany (BIOL 213) or zoology (BIOL 214). Finally, students are also required to take a Group 1 course. The focus of BIOL 112, BIOL 213 or 214, and the Group 1 courses is the relationship between structure and function in a particular system.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

An “Item Information Report” of the MFT from the ETS, which can be purchased for $350 per year is required to sustain results. Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
The item information report will allow biology students at Lander to be compared to students nationally specifically for questions relating to the relationship between structure and function. The biology department will use this data to determine which specific areas of the program need improvement. Additionally, results from questions related to structure and function will be shared with the relevant instructors so that those faculty members can focus instruction in specific areas needing improvement.

## Outcome 3

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of selected questions about information flow and exchange on the Major Field Test (MFT) in biology on which the percent of Lander students answering correctly was as high or higher than the national average percent of students answering correctly.

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on 60% or more of the questions

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on at least 50% but fewer than 60% of the questions

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on fewer than 50% of the questions

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Major Field Test in Biology

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every spring semester to students enrolled in BIOL 499

**Data Collected for this Timeframe (Results)**

68.8%

*If this is a new outcome and no data has been collected, you should explain when data will be*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

*available for entry.*

**Comments/Narrative**

2018-2019
The percent of Lander students answering questions about information flow and exchange on the MFT was as high as or higher than the national average on 68.8% of the questions. Students met expectations for this outcome. Students assessed in the 2018-2019 academic year did markedly better than in 2017-2018 (increase of almost 9%). Data collected over the next few years will be used to detect trends and help faculty to determine whether this is a meaningful increase. It is our hope that repeated exposure to topics related to information flow and exchange in multiple course will help to ensure that students continue to meet expectations for this outcome.

2017-2018
The percent of Lander students answering questions about information flow and exchange on the MFT was as high as or higher than the national average on 60% of the questions. Students met expectations for this outcome. Because Lander students have historically found the topic of information flow and exchange difficult, the required and elective courses within the recently revised biology curriculm emphasize this objective. The new curriculum includes genetics (BIOL 312) as a required course for all students. All students are also required to take a course specifically focused on information flow and exchange (i.e., Group 2 courses). Additionally, students taking the MFT in the future will have had the benefit of a revised introductory biology curriculum (now BIOL 111/112) which now includes more class time dedicated to learning the principles central to building an understanding of information flow and exchange in biological systems.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

An “Item Information Report” of the MFT from the ETS, which can be purchased for $350 per year is required to sustain results. Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
The item information report will allow biology students at Lander to be compared to students nationally specifically for questions relating to information flow and exchange. The biology department will use this data to determine which specific areas of the program need improvement. Additionally, results from questions related to information flow and exchange will be shared with the relevant instructors so that those faculty members can focus instruction in specific areas needing improvement.

## Outcome 4

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge,

skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of selected questions about the pathways and transformations of energy and matter on the Major Field Test (MFT) in biology on which the percent of Lander students answering correctly was as high or higher than the national average percent of students answering correctly.

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on 60% or more of the questions

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on at least 50% but fewer than 60% of the questions

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on fewer than 50% of the questions

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Major Field Test in Biology

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every spring semester to students enrolled in BIOL 499

**Data Collected for this Timeframe (Results)**

58.3%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

2

**Comments/Narrative**

2018-2019
The percent of Lander students answering questions about pathways and transformation of energy and matter on the MFT was as high as or higher than the national average on 58.3% of the questions. Students partially met expectations for this outcome. These results are lower than they were in the previous academic year. These results are somewhat unsurprising because the specific topics covered by this outcome are often particularly difficult for students, and we expect to see fluctuations in student success for this outcome. Data collected over the next few years will be used to detect trends and help faculty to determine whether this is a meaningful decrease. It is our hope that repeated exposure to topics related to pathways and transformations of energy and matter in multiple course will help to ensure that students continue to meet expectations for this outcome.

2017-2018
The percent of Lander students answering questions about pathways and transformation of energy and matter on the MFT was as high as or higher than the national average on 70% of the questions. Students met expectations for this outcome. The success for this objective is caused in part by the recent curriculum revision within the biology department. Students are now required to take a course specifically focused on pathways and transformations of energy and matter (i.e., Group 3 courses). Additionally, students taking the MFT in the future will have had the benefit of a revised introductory biology curriculum (now BIOL 111/112) which now includes more class time dedicated to learning the pathways and transformations of energy and matter on both the cellular level and ecosystem level.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

An “Item Information Report” of the MFT from the ETS, which can be purchased for $350 per year is required to sustain results. Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
The item information report will allow biology students at Lander to be compared to students nationally specifically for questions relating to pathways and transformations of energy and matter. The biology department will use this data to determine which specific areas of the program need improvement. Additionally, results from questions related to pathways and transformations of energy and matter will be shared with the relevant instructors so that those faculty members can focus instruction in specific areas needing improvement.

2017-2018
The item information report will allow biology students at Lander to be compared to students nationally specifically for questions relating to pathways and transformations of energy and matter. The biology department will use this data to determine which specific areas of the program need improvement. Additionally, results from questions related to pathways and transformations of energy and matter will be shared with the relevant instructors so that those faculty members can focus instruction in specific areas needing improvement.

## Outcome 5

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of selected questions about interconnectedness within and among biological systems on the Major Field Test (MFT) in biology on which the percent of Lander students answering correctly was as high or higher than the national average percent of students answering correctly.

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

The percent of Lander students answering the questionscorrectly was as high or higher than the national average on 60% or more of the questions.

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on at least 50% but fewer than 60% of the questions

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on fewer than 50% of the questions

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Major Field Test in Biology

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every spring semester to students enrolled in BIOL 499

**Data Collected for this Timeframe (Results)**

78.6%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

**Comments/Narrative**

2018-2019
The percent of Lander students answering questions about interconnectedness of biological systems on the MFT was as high as or higher than the national average on 78.6% of the questions. Students met expectations for this outcome. Because we expected that this would be a challenging one for the biology program to meet, the results from this year will need to be compared to the results of the next few years to determine if the current results are an artifact of periodic fluctuations in the results or an actual trend that is the product of our recent program changes.

2017-2018
The percent of Lander students answering questions about interconnectedness of biological systems on the MFT was as high as or higher than the national average on 58.3% of the questions. Students partially met expectations for this outcome. Much like outcome 2, outcome 5 will likely continue to be challenging for the biology program to meet. Students may understand the general principle of the interconnectedness of biological systems, but be unfamiliar with the particular system described in a questions. However, the recent biology curriculum revision requires that students take a Group 3 course in which the interconnectedness of systems is specifically addressed. Additionally, students taking the MFT in the future will have had the benefit of a revised introductory biology curriculum (now BIOL 111/112) which now includes more class time dedicated to learning about the interconnectedness of biological systems at multiple scales.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

An “Item Information Report” of the MFT from the ETS, which can be purchased for $350 per year is required to sustain results.  Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
The item information report will allow biology students at Lander to be compared to students nationally specifically for questions relating to the interconnectedness of biological systems. The biology department will use this data to determine which specific areas of the program need improvement. Additionally, results from questions related to the interconnectedness of biological systems will be shared with the relevant instructors so that those faculty members can focus instruction in specific areas needing improvement.

2017-2018
The item information report will allow biology students at Lander to be compared to students nationally specifically for questions relating to the interconnectedness of biological systems. The biology department will use this data to determine which specific areas of the program need improvement. Additionally, results from questions related to the interconnectedness of biological systems will be shared with the relevant instructors so that those faculty members can focus instruction in specific areas needing improvement.

## Outcome 6

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who score 70% or higher on questions about evolution embedded in the Evolution (BIOL 303) final exam.

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students score 70% or higher on questions about evolution embedded in the Evolution (BIOL 303) final exam

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students score 70% or higher on questions about evolution embedded in the Evolution (BIOL 303) final exam

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students score 70% or higher on questions about evolution embedded in the Evolution (BIOL 303) final exam

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Exam questions in Evolution (BIOL 303)

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every semester to students enrolled in BIOL 303

**Data Collected for this Timeframe (Results)**

74.8%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

**Comments/Narrative**

2018-2019
74.8% of students scored 70% or higher on questions about evolution embedded in the Evolution (BIOL 303) final exam. Students met expectations for this outcome. The results from this year will need to be compared to the results of the next few years to determine if the current results are an artifact of periodic fluctuations in the results or an actual trend that is the product of our recent program changes.

2017-2018
66.3% of students scored 70% or higher on questions about evolution embedded in the Evolution (BIOL 303) final exam. Students partially met expectations for this outcome. Because the students in the BIOL 303 course during the 2017-2018 academic year did not take all of the courses in the new biology curriculum, this course was the first time they learned about the intricacies of evolution. As a result of curriculum changes to increase the depth of coverage in evolution throughout our curriculum beginning with BIOL 111, student progress on this outcome should improve over the next few years. Additionally, the assessment questions used for this outcome involved not only understanding the process of evolution, but they also required that students make use of quantitative skills and demonstrate an ability to interpret data in multiple formats, skills we know Lander students have struggled with in the past and are now emphasized more fully in the newly designed curriculum.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include*

*evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

## Outcome 7

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who score 70% or higher on questions about structure function relationships embedded in Group 1 (BIOL 308, BIOL 313, and BIOL 401) exams

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students score 70% or higher on questions
about structure function relationships embedded in Group 1 exams

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students score 70% or higher on questions about structure function relationships embedded in Group 1 exams

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students score 70% or higher on questions about structure function relationships embedded in Group 1 exams

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Exam questions in Group 1 (BIOL 308, BIOL 313, and BIOL 401) courses

**Frequency of Assessment**

Every semester to students enrolled in Group 1 (BIOL 308, BIOL 313, and BIOL 401) courses

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Data Collected for this Timeframe (Results)**

67.7%

**Score (Met=3, Partially Met=2, Not Met=1)**

2

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Comments/Narrative**

2018-2019
67.7% of students scored 70% or higher on questions about structure and function relationships embedded in Group 1 (BIOL 308, BIOL 313, and BIOL 401) exams. Students partially met expectations for this outcome. In contrast to the MFT results for structure function relationships this year in which students made improvements compared to the 2017-2018 assessment cycle, students this year did not show improved results over last year for assessments in their Group 1 courses. Because this is such a new assessment model, we will need to look at the results over the next few years to determine if these results are an artifact of periodic fluctuations in the results or an actual trend that is the product of our recent program changes.

2017-2018
75.6% of students scored 70% or higher on questions about structure and function relationships embedded in Group 1 (BIOL 308, BIOL 313, and BIOL 401) exams. Students met expectations for this outcome. In contrast to the MFT results for structure function relationships, students met expectations when being assessed on structure function relationships specific to the Group 1 course in which they enrolled. We recently changed the biology curriculum to specifically require that students take more than one structure function intensive course, and we hope that students should continue to show improvement in their understanding of structure function relationships within multiple systems.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

2018-2019
Some of the materials to purchase outlined in last year's assessment report have recently been procured. We will be meeting later during this academic year to discuss the utility of these purchases and think about other resources that might be needed to consistently meet this outcome.

2017-2018
To sustain these results, $2500 would allow for purchase of anatomical models and slides for students in BIOL 308 and 313. An additional $1500 would allow purchase of equipment for the BIOL 401 laboratory.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
After discussion with faculty about the purchases made this fall, we will think about future resources that might help to meet this particular outcome. We will report on those in the next assessment report (2019-2020).

2017-2018
$1700 for botanical models for BIOL 313 (models include a herbaceous dicot stem model, a woody dicot stem model, and a dicot root model; slides include 6 anatomical structure, 10 slides each) and $800 for materials to construct surface-area to volume models and replace old models and slides in BIOL 308. $1500 for BIOL 401 would allow purchase of 3 spectrophotometers for student use in the laboratory.

## Outcome 8

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who score 70% or higher on questions about information flow and exchange embedded in Group 2 (BIOL 307, BIOL 403, and BIOL 422) exams

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students score 70% or higher on questions
about information flow and exchanged embedded in Group 2 exams

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students score 70% or higher on questions about information flow and exchange embedded in Group 2 exams

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students score 70% or higher on
questions about information
flow and exchange embedded
in Group 2 exams

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Exam questions in Group 2 (BIOL 307, BIOL 403, and BIOL 422) courses

**Frequency of Assessment**

Every semester to students enrolled in Group 2 (BIOL 307, BIOL 403, and BIOL 422) courses

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Data Collected for this Timeframe (Results)**

69.2%

**Score (Met=3, Partially Met=2, Not Met=1)**

2

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Comments/Narrative**

2018-2019
69.2% of students scored 70% or higher on questions about information flow and exchange embedded in Group 2 (BIOL 307, BIOL 403, and BIOL 422) exams. Students partially met expectations for this outcome. Success on this outcome dropped a little compared to the 2017-2018 assessment year, and only data accumulated over the next few years will inform us about student understanding of information flow and exchange. The assessment results collected for group 2 coursework are very similar to those for information flow & exchange on the MFT. These topics are difficult, and so data that hover between the partially met and met scores may be expected.

2017-2018
72.3% of students scored 70% or higher on questions about information flow and exchange embedded in Group 2 (BIOL 307, BIOL 403, and BIOL 422) exams. Students met expectations for this outcome. To improve student learning on this particular outcome, instructors for these courses have made some specific changes over the last couple years. Students are building on material they learned in introductory courses, and instructors are working to reinforce this foundational material before adding details and new concepts. Additionally, the BIOL 403 instructor has been trying out different course materials (textbook, etc.) in the hopes of finding accessible and useful resources for students (this is an ongoing process).

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

## Outcome 9

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge,

skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who score 70% or higher on questions about pathways and transformations of energy and matter embedded in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) exams

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students score 70% or higher on questions
about pathways and transformations of energy and matter embedded in Group 3 exams

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students score 70% or higher on questions about pathways and transformations of energy and matter embedded in Group 3 exams

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students score 70% or higher on
questions about pathways and transformations of energy and
matter embedded in Group 3 exams

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Exam questions in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) courses.

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every semester to students enrolled in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) courses.

**Data Collected for this Timeframe (Results)**

68.1%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

2

**Comments/Narrative**

2018-2019
68.1% of students scored 70% or higher on questions about pathways and transformations of energy and matter embedded in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) exams. Students partially met expectations for this outcome. The results from this year were slightly lower than those from 2017-2018, and they will need to be compared to the results of the next few years to determine if the current results are an artifact of periodic fluctuations in the results or if we need to make other changes to the way these topics are introduced to students and taught at a deeper level in their upper-level Group 3 courses.

2017-2018
73.6% of students scored 70% or higher on questions about pathways and transformations of energy and matter embedded in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) exams. Students met expectations for this outcome. This success of students for this outcome is likely due to many changes to the Group 3 courses. These courses include active learning in the classroom and long-term projects that the students devise based on their interests and observations. These include semester-long independent projects, ongoing research projects by students in which the students propose research projects, and then design, carry out, analyze, and report the results of their research. This level of immersion in the subject matter has been shown to increase learning by students, and we feel that the changes made over the last few years provide evidence of improved student learning of core concepts in biology.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

## Outcome 10

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who score 70% or higher on questions about the interconnectedness within and among biological systems embedded in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) exams

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students score 70% or higher on questions
about the interconnectedness within and among biological systems embedded in Group 3 exams.

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students score 70% or higher on questions about the interconnectedness within and among biological systems embedded in Group 3 exams.

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students score 70% or higher on questions about the interconnectedness within and among biological systems embedded in Group 3 exams.

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Exam questions in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) courses.

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every semester to students enrolled in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) courses.

**Data Collected for this Timeframe (Results)**

77.1%

*If this is a new outcome and no data has been*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

*collected, you should explain when data will be available for entry.*

**Comments/Narrative**

2018-2019
77.1% of students scored 70% or higher on questions about interconnectedness among biological systems embedded in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) exams. Students met expectations for this outcome. As discussed in the narrative for the 2017-2018 assessment report, these Group 3 courses all include a high level of immersion in the subject matter that has been shown to increase learning by students. We feel that the changes made to these courses and the biology program as a whole provide evidence of improved student learning of this particular core concept in biology.

2017-2018
78.6% of students scored 70% or higher on questions about interconnectedness among biological systems embedded in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) exams. Students met expectations for this outcome. This success of students for this outcome is likely due to many changes to the Group 3 courses. These courses include active learning in the classroom and long-term projects that the students devise based on their interests and observations. These include semester-long independent projects, ongoing research projects by students in which the students propose research projects, and then design, carry out, analyze, and report the results of their research. This level of immersion in the subject matter has been shown to increase learning by students, and we feel that the changes made over the last few years provide evidence of improved student learning of core concepts in biology.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

# Goal Summary

**Goal Summary/Comments**

2018-2019
Again this year, students partially met expectations for Program Goal 1. This goal is to ensure that students have met expectations in understanding the five core concepts in biology: evolution, structure and function relationships, information flow and exchange, pathways and transformations of energy and matter, and the interconnectedness within and among living systems. Each of these concepts is assessed using the MFT in biology and using course-embedded exam questions. When assessed by the MFT, students failed to meet expectations in understanding structure and function relationships, information flow and exchange, as well as understanding the pathways and transformations of energy and matter in biological systems (these results only differ slightly from the 2017-2018 results when students failed to meet expectations in understanding structure and function relations and the interconnectedness of biological systems). Additionally, when students were assessed though course embedded questions, they failed to meet expectations in understanding structure and function relationships, information flow and exchange, and pathways and transformations of energy. However, students did meet expectations regardless of assessment method for outcomes related to an understanding of evolution and the interconnectedness of biological systems.

*Analyze your results and show you are seeking improvement. If this is a goal you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Changes Made/Proposed Related to Goal**

2018-2019
Although there were changes for which of the outcomes student success was high over the last two years, the data show fairly small fluctuations for most of these outcomes. The data collected may reflect expected year-to-year variation or they may reflect actual trends in student understanding of these topics. As we collect additional data, we will meet to discuss the meaning of these results. Due to the timing of data collection and compilation and faculty work contract dates, meeting during the fall semester of each year doesn't seem to be our best option. We plan to have yearly meetings with faculty teaching courses that are part of program assessment to discuss these data and to examine trends that we find. The results of these meetings will be discussed in the assessment report for the next year.

2017-2018
The biology curriculum has been dramatically revised to ensure that expectations related to student understanding of the core concepts in biology are met. First, the introductory biology sequence has been spread from one semester to two semesters in order to provide more time to cover all of the core concepts in sufficient detail. An evolution course has been added to ensure that students recognize that evolution is the unifying theme in biology, and faculty will continue to incorporate relevant evolution topics in each of their courses. All of the other concepts are emphasized in either the core biology courses (i.e., Genetics, BIOL 312), or in a particular group (i.e., Diversity, Group 1, Group 2, or Group 3). Each of these courses will emphasize one or two of the specific concepts central to understanding biology. Students who complete the biology major will have taken at least one course that emphasizes each of the core concepts. Because the biology curriculum has been so recently revised, we have only been collecting data on this program goal for 1 year. We will continue to accrue data on student success for this program goal, share these data with faculty, and use these data to inform teaching in the relevant courses within the curriculum.

*Describe changes that will be made in response to assessment results. Essential to "close the loop".*

**Upload Rubrics/Other Files**
*Please upload any rubrics or other documents used for this goal.*

## Goal 2

**Program Goals** are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

**Every Academic Program must include one goal on Program Productivity data for the South Carolina Commission on Higher Education. Information pertaining to this goal was sent by the Director of Institutional Effectiveness.**

Students will be able to apply appropriate quantitative reasoning, models, and simulations to classic and novel problems in biology.

**Pillar of Success Supported**
⊙ High-Demand, Market-Driven Programs

○ Selective, Competitive Recruitment and Enrollment of Ambitious and Talented Students

○ Robust Student Experience

○ Graduates Who Are Gainfully Employed or Admitted to Graduate School

○ Advancement Activities Leveraged to Further the University's Mission

○ Engaged and Supportive Alumni

○ Financially Stable and Operationally Efficient

○ Facilities Positioned for Growth and Efficient Utilization

○ Employer of Choice

○ Highly-Valued Community Partner

*Choose the Pillar of Success that your goal best aligns with.*

# Outcomes

## Outcome 1

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of selected questions requiring quantitative reasoning on the Major Field Test (MFT) in biology on which the percent of Lander students answering correctly was as high or higher than the national average percent of students answering correctly

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on 60% or more of the questions

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on at least 50% but fewer than 60% of the questions

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on fewer than 50% of the questions

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Major Field Test (MFT) in biology (questions related to quantitative reasoning)

**Frequency of Assessment**

Every spring semester to students enrolled in BIOL 499

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Data Collected for this Timeframe (Results)**

64.3%

**Score (Met=3, Partially Met=2, Not Met=1)**

3

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Comments/Narrative**

2018-2019
The percent of Lander students answering questions requiring quantitative reasoning on the MFT was as high as or higher than the national average on 64.3% of the questions. Students met expectations for this outcome. Compared to last year's assessment results, this year showed an almost 10% increase. We have made an effort to increase the amount of quantitative reasoning in many of our core and elective courses over the last few years, and we think that we may be seeing a meaningful increase in students' abilities to deal with quantitative problems.

2017-2018
The percent of Lander students answering questions requiring quantitative reasoning on the MFT was as high as or higher than the national average on 54.5% of the questions. Students partially met expectations for this outcome. These results are not surprising. Lander biology majors have historically struggled with quantitative reasoning and modeling/simulation, and for this topic was chosen as one of the program goals for assessment. Recent changes to the biology curriculum included the addition of more quantitative reasoning exercises in the first year courses (BIOL 111/112), the creation of a new required evolution course (BIOL 303) that focuses on these skills, and implementation of assessment for these skills in the Group 2 courses (BIOL 307, BIOL 403, and BIOL 422). The goal of these changes was to broadly increase exposure to more mathematical applications throughout the curriculum. Additionally, we put a plan in place to increase the number of activities and topics in which the students are exposed to and make use of models and simulations. Because the curriculum changes are so new, our current senior-level students (for whom data is reported here on the MFT) have not taken these revised courses.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

An “Item Information Report” of the MFT from the ETS, which can be purchased for $350 per year is required to sustain results.  Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
The item information report will allow biology students at Lander to be compared to students nationally specifically for questions relating to quantitative reasoning. The biology department will use this data to determine which specific areas of the program need improvement. Additionally, results from questions related to the quantitative reasoning will be shared with the relevant instructors so that those faculty members can focus instruction in specific areas needing improvement.

## Outcome 2

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who score a 70% or higher on modeling and simulation assessments embedded within the Evolution (BIOL 303) course

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students score 70% or higher on modeling and simulation assignments embedded in the Evolution (BIOL 303) course

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students score 70% or higher on modeling and simulation assignments embedded within the Evolution (BIOL 303) course

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students score 70% or higher on modeling and simulation assignments embedded within the Evolution (BIOL 303) course

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Assignment in evolution (BIOL 303)

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every semester to students enrolled in BIOL 303

**Data Collected for this Timeframe (Results)**

63.8%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

2

**Comments/Narrative**

2018-2019
63.8 percent of students scored 70% or higher on modeling and simulation assessments embedded within the Evolution (BIOL 303) course. Students partially met expectations for this outcome. This was a substantial decrease in success compared to the 2017-2018 results. While the students assessed in 2017-2018 were mostly juniors and seniors in the program, the students assessed in 2018-2019 were nearly all either sophomores in the program or students repeating the course because they did not pass the course the first time. The results of the most recent assessment may be similar to what we should expect to see from students who have not progressed as far in the program. We will need to track data for the next few years to begin to detect trends and parse them apart from expected periodic fluctuations that we may observe from year to year in the data.

2017-2018
83.1 percent of students scored 70% or higher on modeling and simulation assessments embedded within the Evolution (BIOL 303) course. Students met expectations for this outcome. The BIOL 303 course was designed as a sophomore course, and the assessments created for this outcome are appropriate for second year students. Nearly all of the BIOL 303 students assessed during the 2017-2018 cycle were seniors or juniors in the program. The ease with which students met expectations for this outcome was likely at least partially due to this fact. Additionally, these assignments were not completed in the context of an exam, and so students were able to use their textbook, talk with other students, and ask questions of the instructor. It was our prediction that students would score better on this type of assessment than they would on the MFT or on embedded exam questions, and so these 2017-2018 results are not unexpected.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

2018-2019
Some of the materials to purchase outlined in last year's assessment report have recently been procured. We will be meeting later during this academic year to discuss the utility of these purchases and think about other resources that might be needed to consistently meet this outcome.

2017-2018
$900 would allow purchase of two classroom sets of calculators (TI-30XS Multiview scientific calculators). These are the same type of calculators students use in their MATH 121 course, and this would ensure continuity between classes and make it unnecessary for students to learn to use a different calculator for their major courses.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
After discussion with faculty about the purchases made this fall, we will think about future resources that might help to meet this particular outcome. We will report on those in the next assessment report (2019-2020).

2017-2018
To sustain results on this indicator, access to appropriate calculators is necessary. Purchase of classroom sets would ensure access for all students and greatly increase instructor ability to aid students in using their calculator. Calculator sets could easily be shared between BIOL 111, 112, and 303 students.

## Outcome 3

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who score a 70% or higher on quantitative reasoning assessments embedded within the Genetics (BIOL 312) course

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students score 70% or higher on quantitative reasoning assignments embedded within the Genetics (BIOL 312) course

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students score 70% or higher on quantitative reasoning assignments embedded within the Genetics (BIOL 312) course

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students score 70% or higher on quantitative reasoning assignments embedded within the Genetics (BIOL 303) course

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Assignment in genetics (BIOL 312)

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every fall semester to students enrolled in BIOL 312

**Data Collected for this Timeframe (Results)**

95.7%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

**Comments/Narrative**

2018-2019
95.7 percent of students scored 70% or higher on quantitative reasoning assessments embedded within the Genetics (BIOL 312) course. Students met expectations for this outcome. Because students were assessed based on an assignment (not an exam) for which they were able to use outside resources, the results would be expected to be higher than those collected from questions on a standardized test or course exam. The data collected may reflect expected year-to-year fluctuations or they may reflect actual trends in student understanding of these topics.  As we collect additional data, we will meet to discuss the meaning of these results.

2017-2018
82.7 percent of students scored 70% or higher on quantitative reasoning assessments embedded within the Genetics (BIOL 312) course. Students met expectations for this outcome. Similar to the BIOL 303 assessment, students were assessed based on an assignment (not an exam) for which they were able to use outside resources. Accordingly, the number of students that were successful on this assessment was quite high. It was our prediction that students would score better on this type of assessment than they would on the MFT or on embedded exam questions, and so these 2017-2018 results are not unexpected.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the*

*past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

2018-2019
No additional resources have been identified at this time.  We will be meeting later during this academic year to discuss additional resources that might be needed to consistently meet this outcome, and the instructor for the BIOL 312 course is still interested in purchasing materials for the construction of a CO2 anesthetizing system for students to use in the genetics laboratory.

2017-2018
Approximately $2000 would allow purchase of materials for the construction of a CO2 anesthetizing system for students to use in the genetics laboratory.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
Students in the BIOL 312 course have particular difficulty with parts of the laboratory that are unrelated to their learning of the content, and one of these is easy anesthetization of their flies. In the course right now, this process is difficult and clearly gets in the way of learning by creating frustration and using large amounts of student time outside the classroom. Students get bogged down in the steps of the laboratory and lose sight of the larger experiments they are completing. This makes learning the quantitative aspects of genetics substantially more onerous than it actually should be. All biology majors would be positively affected by this purchase.

## Outcome 4

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who score a 70% or higher on quantitative reasoning or modeling and simulation assessments embedded within the Group 2 (BIOL 307, BIOL 403, and BIOL 422) courses

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students score 70% or higher on quantitative reasoning or modeling and simulation assignments embedded within the Group 2 courses

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students score 70% or higher on quantitative reasoning or modeling and simulation assignments embedded within the Group 2 courses

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students score 70% or higher on quantitative reasoning or modeling and simulation assignments embedded within the Group 2 courses

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Assignments in Group 2 (BIOL 307, BIOL 403, and BIOL 422) courses

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every semester to students enrolled in Group 2 (BIOL 307, BIOL 403, and BIOL 422) courses

**Data Collected for this Timeframe (Results)**

75.8%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

**Comments/Narrative**

2018-2019
75.8 percent of students scored 70% or higher on quantitative reasoning or modeling and simulation assessments embedded within the Group 2 (BIOL 307, BIOL 403, and BIOL 422) courses. Students met expectations for this outcome. This is a large increase in success rate compared to last year. The results from this year will need to be compared to the results of the next few years to determine if the current results are an artifact of periodic fluctuations in the results or an actual trend that is the product of our recent program changes.

2017-2018
54.4 percent of students scored 70% or higher on quantitative reasoning or modeling and simulation assessments embedded within the Group 2 (BIOL 307, BIOL 403, and BIOL 422) courses. Students failed to meet expectations for this outcome. For the courses assessed during the 2017-2018 academic year, these assessments were embedded exam questions. Student success was predictably lower on this outcome and very similar to the success of students on Outcome 1 for this program goal.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include*

*evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

# Goal Summary

**Goal Summary/Comments**

2018-2019
For this program goal, students met expectations for two of the outcomes and partially met expectations for the other two outcomes.  Overall, these results are promising and an improvement over the 2018-2018 results.  When devising the assessments for this outcome, we felt it was important to measure student progress using different instruments, and we feel that this explains the discrepancies between the results for the four outcomes. In situations where students could receive assistance or use outside sources on their assessment, scores might be higher than in test situations. For a skillset as broad as quantitative reasoning and modeling and simulation, we think that these results provide a large amount of data that we will be able to use to design and implement future assessments. Moving students from success on assignments to success on class exams and standardized exams is obviously the larger goal, and we plan to continue to track student progress in achieving this goal over the next few years as students are repeatedly exposed to these skills as part of the newly revised biology curriculum.

*Analyze your results and show you are seeking improvement. If this is a goal you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Changes Made/Proposed Related to Goal**

2018-2019
Some of the steps outlined in last year's assessment report have been undertaken by instructors for the 2019-2020 academic year.  We will be meeting later this year to discuss the utility of these changes and think about other changes that might be needed to consistently meet this outcome.

2017-2018
Faculty teaching the oourses assessed for this program goal are planning to make at least some of the following changes in their courses: increase the number of practice problems students are assigned, spend more class and discussion time learning to interpret data, and to increase the frequency at which students are exposed to these concepts. As students who started as freshmen in the new curriculum reach upper-class status, we hope to see improvements in attaining this program goal for each of the outcomes. We will continue to collect and analyze data for this program goal and propose changes to courses each year.

*Describe changes that will be made in response to assessment results. Essential to "close the loop".*

**Upload Rubrics/Other Files**
*Please upload any rubrics or other documents used for this goal.*

## Goal 3

**Program Goals** are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

**Every Academic Program must include one goal on Program Productivity data for the South Carolina Commission on Higher Education. Information pertaining to this goal was sent by the Director of Institutional Effectiveness.**

Students will be able to explain and apply the process of science by formulating testable hypotheses, designing experiments, and collecting and analyzing data to draw conclusions about the degree to which data support their hypotheses.

**Pillar of Success Supported**
- ⦿ High-Demand, Market-Driven Programs
- ○ Selective, Competitive Recruitment and Enrollment of Ambitious and Talented Students
- ○ Robust Student Experience
- ○ Graduates Who Are Gainfully Employed or Admitted to Graduate School
- ○ Advancement Activities Leveraged to Further the University's Mission
- ○ Engaged and Supportive Alumni
- ○ Financially Stable and Operationally Efficient
- ○ Facilities Positioned for Growth and Efficient Utilization
- ○ Employer of Choice
- ○ Highly-Valued Community Partner

*Choose the Pillar of Success that your goal best aligns with.*

# Outcomes

## Outcome 1

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of selected questions about the process of science on the Major Field Test (MFT) in biology on which the percent of Lander students answering correctly was as high or higher than the national average percent of students answering correctly

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on 60% or more of the questions

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on at least 50% but fewer than 60% of the questions

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

The percent of Lander students answering the questions correctly was as high or higher than the national average on fewer than 50% of the questions

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Major Field Test (MFT) in biology (questions related to the process of science)

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every spring semester to students enrolled in BIOL 499

| Data Collected for this Timeframe (Results) | Score (Met=3, Partially Met=2, Not Met=1) |
|---|---|
| 73.3% | 3 |

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Comments/Narrative**

2018-2019
The percent of Lander students answering questions requiring quantitative reasoning on the MFT was as high as or higher than the national average on 73.3% of the questions. Students met expectations for this outcome. The results for this year showed an increase in success compared to last year. The results from this year will need to be compared to the results of the next few years to determine if the current results are an artifact of periodic fluctuations in the results or an actual trend that is the product of our recent program changes.

2017-2018
Although students did meet expectations in the 2017-2018 academic year, there is room for improvement. The Biology Department has made major revisions to multiple courses to improve student performance on the “Process of Science” questions on the MFT. For example, the laboratory components of the introductory courses for biology majors, BIOL 111 and BIOL 112, have been completely revised. In the past, labs were primarily used to reinforce lecture concepts. They have been completely revised, and now the labs are inquiry based. The labs in both semesters guide students through the steps of the scientific process. Students learn to carefully observe natural phenomena, ask questions, form hypotheses, design experiments, and analyze and interpret the results of their experiments. Although the process is highly structured for these introductory classes, these courses are the first step in scaffolding the skills students need to explain and apply the process of science. Additionally, the courses in the biology seminar series (BIOL 299, 399, and 499) are focused on reading, analyzing, and interpreting peer-reviewed journal articles in biology. The seminars expose students to the scientific process, and move students from understanding (BIOL 299) to analyzing and evaluating (BIOL 399) to synthesizing (BIOL 499) the process of science. Other courses within the biology department have revised the curriculum in various ways to emphasize the process of science. For example, in Ecology (BIOL 306) students are required to manipulate large data sets, to formulate questions and hypotheses based on these data, to analyze these data, and to draw conclusions based on the results of their analyses. Additionally, in several upper-level courses instructors have incorporated exam questions similar in format to those found on the MFT, which often ask students to draw conclusions based on data provided. It will be several years before students who have had the benefit of all the course revisions are assessed for this outcome, so we expect a gradual increase in scores over the next three to four years.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

2018-2019
An “Item Information Report” of the MFT from the ETS, which can be purchased for $350 per year is required to sustain results. Resource identified as needed in 2017-2018, 2018-2019 assessment reports. Additionally, a BIOL 111/BIOL 112 laboratory budget of $4000 - $6000 per year is required to sustain these results. Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

2017-2018
The resources required to sustain and improve results are an “Item Information Report” of the MFT from the ETS, which can be purchased for $350 per year, a BIOL 111/BIOL 112 laboratory budget of $4000 - $6000 per year, and additional funds for professional development for the faculty teaching courses with revised content and for faculty planning to revise their course content ($2000 - $3000).

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

2018-2019
The item information report from the ETS will be used to compare Lander students answers on specific questions from the MFT to the national average for those questions. Without this analysis, we cannot assess student performance on specific competencies. The BIOL 111/BIOL 112 laboratory budget will purchase supplies and equipment for inquiry-based laboratory projects.

2017-2018
The item information report from the ETS will be used to compare Lander students answers on specific questions from the MFT to the national average for those questions. Without this analysis, we cannot assess student performance on specific competencies. The BIOL 111/BIOL 112 laboratory budget will purchase supplies and equipment for inquiry-based laboratory projects. Finally, the professional development funds will be used to send faculty members to workshops and conferences focusing on science pedagogy. Examples include the annual “Innovation in Teaching Conference” held each year at UGA and the pedagogy-related sessions of the “Association for Southeastern Biologists” annual meeting.

## Outcome 2

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who score a 70% or higher on process of science assessments embedded within the Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) courses

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students score 70% or higher on process of science assignments embedded within Group 3 courses

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students score 70% or higher on process of science assignments embedded within Group 3 courses

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students score 70% or higher on process of science assignments embedded within Group 3 courses

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Assignments embedded in Group 3 (BIOL 306, BIOL 311, BIOL 415, and BIOL 421) courses

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every semester for students enrolled in Group 3 courses

**Data Collected for this Timeframe (Results)**

81.5%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

**Comments/Narrative**

2018-2019
81.5 percent of students scores 70% or higher on process of science assignments embedded within Group 3 courses.
Students met expectations for this outcome, which measured student performance on course-embedded research projects. Expectations were met because the courses requiring research projects were revised both to grant students freedom to choose and design an independent research project, as well as to provide formative assessment to students as they conducted the research. The freedom to choose and design a research project is important because it ensures students are interested and invested in the process. Additionally, it forces students to apply the scientific process in its entirety, from making observations and asking questions, to communicating research findings. The implementation of formative assessments in course-embedded research projects gives students the feedback necessary to revise and improve projects as they are conducted. In addition to improving students' scores on the projects, the revision process makes a space for student learning, and closely models how the scientific process works for professional scientists.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

To sustain results for this indicator, $6000 per academic year would provide an ample budget to ensure students could complete course-embedded research projects. Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

Each year, up to 60 students enroll in the Group 3 courses with course-embedded research projects. Each project requires consumable laboratory supplies. Students engaged in these research projects can use existing equipment within the biology department, but other items including reagents, live organisms, pipettes, etc. must be purchased for each project. A budget of $100 per student would allow students some freedom from budgetary constraints when designing research projects.

# Goal Summary

**Goal Summary/Comments**

Again this year, students met expectations for both outcomes related to Program Goal 3 indicating that the biology program is doing a fairly good job teaching biology majors about the process of science. Faculty agree that students still need to work on improving the quality of their course-embedded research projects, and we will be meeting to discuss strategies to increase the quality of the final products of their research throughout our program later this year. These outcomes will continue to be assessed and revised to ensure that Program Goal 3 will continue to be met.

*Analyze your results and show you are seeking improvement. If this is a goal you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Changes Made/Proposed Related to Goal**

A number of changes have been made to the biology program in order to improve the results from outcomes 1 and 2. First, the introductory biology laboratory has been completely revised to focus almost exclusively on the process of science. Second, a biology seminar series has been introduced to teach students how to read, understand, analyze, and evaluate the process of science as described in the primary literature. Research projects have been embedded within all the group 3 courses so that students have an opportunity to work all the way through the scientific process and to revise their projects in response to feedback. Finally, individual instructors have made analyzing scientific results a priority in specific courses, allowing students the opportunity to practice understanding the process of science in a way that closely mirrors the way it is presented on the MFT.

*Describe changes that will be made in response to assessment results. Essential to "close the loop".*

**Upload Rubrics/Other Files**
*Please upload any rubrics or other documents used for this goal.*

## Goal 4

**Program Goals** are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

**Every Academic Program must include one goal on Program Productivity data for the South Carolina Commission on Higher Education. Information pertaining to this goal was sent by the Director of Institutional Effectiveness.**

Students will be able to navigate relevant primary literature, and identify and evaluate appropriate sources for a given topic.

**Pillar of Success Supported**
⊙ High-Demand, Market-Driven Programs

○ Selective, Competitive Recruitment and Enrollment of Ambitious and Talented Students

○ Robust Student Experience

○ Graduates Who Are Gainfully Employed or Admitted to Graduate School

○ Advancement Activities Leveraged to Further the University's Mission

○ Engaged and Supportive Alumni

○ Financially Stable and Operationally Efficient

○ Facilities Positioned for Growth and Efficient Utilization

○ Employer of Choice

○ Highly-Valued Community Partner

*Choose the Pillar of Success that your goal best aligns with.*

# Outcomes

## Outcome 1

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of Biology graduates who scored a 2 (Proficient) or a 3 (Advanced) on the “Resources” criterion of the Student Presentation Rubric

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students scored a 2 or a 3 on the “Resources” criterion of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students scored a 2 or a 3 on the “Resources” criterion of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students scored a 2 or a 3 on the “Resources” criterion of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

BIOL 499 Student Oral Presentation Rubric

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every spring semester to students enrolled in BIOL 499

**Data Collected for this Timeframe (Results)**

81.7%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

**Comments/Narrative**

2018-2019
81.7% of the students assessed scored a 2 or 3 on the “Resources” criterion of the presentation rubric in BIOL 499. Students met expectations for this outcome again this year. Although we are still fairly confident that the changes outlined in the comments below from the 2017-2018 report are responsible for student success on this outcome, we will continue to monitor student success and examine the data from multiple years to determine if the current results are an artifact of periodic fluctuations in the results or an actual trend that is the product of our recent program changes.

2017-2018
86.5% of the students assessed scored a 2 or 3 on the “Resources” criterion of the presentation rubric in BIOL 499. Students met expectations for this outcome. The Biology Department has made numerous changes to individual courses and the curriculum overall to increase students’ ability to navigate the primary literature relevant to the science of biology Students are now introduced to primary literature during their first year of the program in the newly designed BIOL 111 and 112 laboratories. Students read primary literature during the new BIOL 303 course required of all majors, and the biology seminar series (BIOL 299,399, 499) build on this foundation. In BIOL 299, students learn to identify and evaluate sources for their appropriateness, read primary literature, and analyze and present on these articles in the course. In BIOL 399, students begin to choose their own papers and are expected to be able to identify and evaluate peer-reviewed articles. BIOL 399 culuminates with students independently presenting a summary of one primary literature article of their own selection. In BIOL 499, students independently present a synthesis of three journal articles they choose. Throughout the series, students learn to select appropriate articles, carefully read the literature, and write summaries of the papers they read. The students evaluated in BIOL 499 during the 2017-2018 academic year are the first students to have completed the entire seminar series. Students in the biology program historically had difficulty finding appropriate primary literature, and this deficiency was one of the main reasons the seminar courses were expanded and are required of biology majors.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

The resources required to sustain and improve results are books on communication in science for students at a cost of $20 each for CSE guidelines and $75 each for copies of the standard writer’s guide for science writing. For the number of biology students that are typically in BIOL 299, this would amount to approximately $500. Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

Books on scientific communication will give students an extra resource for improving their skills and could be used throughout the seminar series.

## Outcome 2

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of Biology graduates who scored a 2 (Proficient) or a 3 (Advanced) on the “Content and Organization” criterion of the Student Presentation Rubric

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students scored a 2 or a 3 on the “Content and Organization” criterion of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students scored a 2 or a 3 on the “Content and Organization” criterion of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students scored a 2 or a 3 on the “Content and Organization” criterion of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

BIOL 499 Student Oral Presentation Rubric

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every spring semester to students enrolled in BIOL 499

**Data Collected for this Timeframe (Results)**

71.8%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

**Comments/Narrative**

2018-2019
71.8% of the students assessed scored a 2 or 3 on the “Content and Organization” criterion of the presentation rubric in BIOL 499. Although students met expectations for this outcome, success was lower than in the 2017-2018 academic year. We plan to examine these data over the next few years to determine a baseline success rate so that we are better able to identify meaningful trends in the data and separate them from expected fluctuations that may occur from year to year.

2017-2018
80.2% of the students assessed scored a 2 or 3 on the “Content and Organization” criterion of the presentation rubric in BIOL 499. Students met expectations for this outcome. As a result of the numerous changes to individual courses and the curriculum overall in the Biology Department (described above), students are exposed to primary literature early on in their coursework as majors and revisit primary literature during each year of the biology curriculum. Because students in the biology program historically had difficulty finding and discussing appropriate primary literature, this deficiency was one of the main reasons the seminar courses were expanded and are required of biology majors. Students evaluated in BIOL 499 during the 2018-2018 academic year are the first students to have completed the entire seminar series.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

# Goal Summary

**Goal Summary/Comments**

Again this year, students met expectations for these outcomes; however, we feel that there is room for improvement. The redesign of the biology curriculum (outside of the new seminar series) will increase student exposure to primary literature and we hope to see that students progressing through the new curriculum will continue to show increased proficiency in both identifying appropriate sources and using these sources to complete larger projects in the seminar series and in their other biology courses.

*Analyze your results and show you are seeking improvement. If this is a goal you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Changes Made/Proposed Related to Goal**

The seminar series was designed and developed to increase student proficiency in finding appropriate primary sources, and gaining experience in analyzing and explaining research in the sources they identify. One major change that faculty will continue to work on and refine during this academic year is writing core rubrics for a number of these outcomes. The goal is to develop a series of basic rubrics that faculty can use as a starting point when designing assessments involving primary literature, the process of science, and scientific communication (in both written and oral forms). We plan to meet early during spring semester 2020 to discuss these rubrics, and then have these new rubrics in place in time for assessment during the 2020-2021 academic year.

*Describe changes that will be made in response to assessment results. Essential to "close the loop".*

**Upload Rubrics/Other Files**
*Please upload any rubrics or other documents used for this goal.*

## Goal 5

**Program Goals** are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

**Every Academic Program must include one goal on Program Productivity data for the South Carolina Commission on Higher Education. Information pertaining to this goal was sent by the Director of Institutional Effectiveness.**

Students will be able to accurately and effectively communicate and collaborate within the discipline of biology and with other disciplines.

**Pillar of Success Supported**

- ⦿ High-Demand, Market-Driven Programs
- ○ Selective, Competitive Recruitment and Enrollment of Ambitious and Talented Students
- ○ Robust Student Experience
- ○ Graduates Who Are Gainfully Employed or Admitted to Graduate School
- ○ Advancement Activities Leveraged to Further the University's Mission
- ○ Engaged and Supportive Alumni
- ○ Financially Stable and Operationally Efficient
- ○ Facilities Positioned for Growth and Efficient Utilization

○ Employer of Choice

○ Highly-Valued Community Partner

*Choose the Pillar of Success that your goal best aligns with.*

# Outcomes

## Outcome 1

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of biology seniors who scored a 2 (Proficient) or a 3 (Advanced) on the “Effective Scientific Communication” criterion of the Student Presentation Rubric

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students scored a 2 or a 3 on the “Effective Scientific Communication” criterion of the presentation rubric

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students scored a 2 or a 3 on the “Effective Scientific Communication” criterion of the presentation rubric

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students scored a 2 or a 3 on the “Effective Scientific Communication” criterion of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

BIOL 499 Student Oral Presentation Rubric

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex.*

**Frequency of Assessment**

Every spring semester to students enrolled in BIOL 499

*Capstone assignment).*

| Data Collected for this Timeframe (Results) | Score (Met=3, Partially Met=2, Not Met=1) |
|---|---|
| 74.6% | 3 |

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Comments/Narrative**

2018-2019
74.6% of students scored a 2 or a 3 on the “Effective Scientific Communication” criterion of the presentation rubric. Students met expectations for this outcome. This is an improvement over last year's assessment results. We plan to examine the data collected for this outcome over the next few years to determine if the current results are an artifact of periodic fluctuations in the results or an actual trend that is the product of our recent program changes.

2017-2018
66.3% of students scored a 2 or a 3 on the “Effective Scientific Communication” criterion of the presentation rubric. Students partially met expectations in the 2017–2018 academic year. The Biology Department has made numerous changes to individual courses and the curriculum to make students more effective at communicating science. The biology seminar series (BIOL 299, 399, 499) develops oral and written communication skills by having students read, analyze, and present on articles from the primary literature. BIOL 299 culminates with students presenting a summary of a journal article as part of a group. BIOL 399 culminates with students independently presenting a summary of a journal article that they chose. BIOL 499 culminates with students independently presenting a synthesis of three journal articles that they chose. The written and oral summaries at each level of the seminar series focus on a student’s ability to identify the major research questions in the journal article and to describe and explain the experimental design and results of the article. The students evaluated in BIOL 499 during the 2017–2018 academic year are the first students to have completed the seminar sequence. The introductory courses for biology majors (BIOL 111 and BIOL 112) have also undergone significant revisions with the goal of increasing a student’s ability to effectively communicate science. The lecture and lab portions of the course now include numerous small-scale writing assignments. Students keep written research records for their labs and have short writing assignments and exam responses in lecture. It will still be several years before the students who have been through the revised BIOL 111 and 112 will be giving presentations in BIOL 499.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

The resources required to sustain and improve results are books on communication in science for students at a cost of $20 each for CSE guidelines and $75 each for copies of the standard writer’s guide for science writing. For the number of biology students that are typically in BIOL 299, this would amount to approximately $500. Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

Books on scientific communication will give students an extra resource for improving their skills and could be used throughout the seminar series.

## Outcome 2

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of biology seniors who scored a 2 (Proficient) or a 3 (Advanced) on the “Appropriate Scientific Communication (Vocabulary)” and “Appropriate Scientific Communication (Style/Delivery)” criteria of the Student Presentation Rubric

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students scored a 2 or a 3 on the “Appropriate Scientific Communication (Vocabulary)” and “Appropriate Scientific Communication (Style/Delivery)” criteria of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students scored a 2 or a 3 on the “Appropriate Scientific Communication (Vocabulary)” and “Appropriate Scientific Communication (Style/Delivery)” criteria of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students 2.00 scored a 2 or a 3 on the “Appropriate Scientific Communication (Vocabulary)” and “Appropriate Scientific Communication (Style/Delivery)” criteria of the Student Presentation Rubric

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used** **Frequency of Assessment**

| BIOL 499 Student Oral Presentation Rubric | Every spring semester to students enrolled in BIOL 499 |
|---|---|

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

| **Data Collected for this Timeframe (Results)** | **Score (Met=3, Partially Met=2, Not Met=1)** |
|---|---|
| 70.2% | 3 |

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Comments/Narrative**

2018-2019
70.2% of students scored a 2 or a 3 on the “Appropriate Scientific Communication” criterion of the presentation rubric. Students met expectations for this outcome. This is an improvement over last year's assessment results. We plan to examine the data collected for this outcome over the next few years to determine if the current results are an artifact of periodic fluctuations in the results or an actual trend that is the product of our recent program changes.

2017-2018
62.5% of students scored a 2 or a 3 on the “Appropriate Scientific Communication” criterion of the presentation rubric. Students partially met expectations in the 2017–2018 academic year. The Biology Department has made changes to the curriculum that aim to improve the oral communication skills of our students. The expanded biology seminar series (BIOL 299, 399) was developed in response to the difficulties in effective oral communication that biology majors were experiencing in BIOL 499. Students moving through the seminar series are guaranteed to give several oral presentations each year. The 2017–2018 academic year is the first year where the students in BIOL 499 have completed the entire seminar series.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

The resources required to sustain and improve results are books on communication in science for students at a cost of $20 each for CSE guidelines and $75 each for copies of the standard writer’s guide for science writing. For the number of biology students that are typically in BIOL 299, this would amount to approximately $500. Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

Books on scientific communication will give students an extra resource for improving their skills and could be used throughout the seminar series.

## Outcome 3

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Student Learning Outcome

**Enter Outcome**

Percent of students who scored a 70% or higher on writing assignments embedded in Group 1 (BIOL 308, BIOL 313, and BIOL 401) courses

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

At least 70% of students scored 70% or higher on writing assignments embedded in Group 1 courses

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

At least 60% but fewer than 70% of students scored 70% or higher on writing assignments embedded in Group 1 courses

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Fewer than 60% of students scored 70% or higher on writing assignments embedded in Group 1 courses

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Writing assignment rubrics from Group 1 (BIOL 308, BIOL 313, and BIOL 401) courses

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Every semester to students enrolled in Group 1 (BIOL 308, BIOL 313, and BIOL 401) courses

**Data Collected for this Timeframe (Results)**

72%

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

**Comments/Narrative**

2018-2019
Again this year, 72% of students scored a 70% or higher on writing assignments in the Group 1 course (BIOL 308, 313, 401). Students met expectations for this outcome. We plan to examine the data collected for this outcome over the next few years to determine if the current results are an artifact of periodic fluctuations in the results or an actual baseline level of performance that we can expect as a result of our recent program changes.

2017-2018
72% of students scored a 70% or higher on writing assignments in the Group 1 course (BIOL 308, 313, 401). Students met expectations for this outcome. Students were assessed by writing assignments in the Group 1 courses (BIOL 308, 313, 401). Under the new biology curriculum, majors are required to complete at least one of these courses. The expanded biology seminar series (BIOL 299, 399) requires students to write summaries of peer-reviewed journal articles. These summaries are expected to be clearly written and accurately reflect the paper read by the students. The new introductory biology sequence (BIOL 111 and 112) have been modified to include a larger number of writing assignments. The increase in assignments (through lecture and lab) and meaningful feedback give students more opportunities to develop writing skills. The assessment of written communication met expectations where the assessments of oral communication were only partially met. In some Group 1 courses, students were allowed to revise their writing assignments before they were graded for the final assessment. This increases the percentage of students that meet expectations. Allowing revisions is also a reflection of the writing process in science, which is often collaborative and involves reviewer that give recommendations for revisions to your writing.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

The resources required to sustain and improve results are books on communication in science for students at a cost of $20 each for CSE guidelines and $75 each for copies of the standard writer's guide for science writing. For the number of biology students that are typically in BIOL 299, this would amount to approximately $500. Resource identified as needed in 2017-2018, 2018-2019 assessment reports.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

Books on scientific communication will give students an extra resource for improving their skills and could be used throughout the seminar series.

# Goal Summary

**Goal Summary/Comments**

Students met the expectations for all three outcomes used to assess this goal. It is the hope of the faculty teaching these courses that students are gaining communication skills from repeated practice in their courses within the biology program and in their general education and elective courses. Students have historically struggled with their ability to communicate in the appropriate scientific manner and so the seminar series was developed to provide a useful scaffolding of these skills into the biology curriculum. Faculty teaching the courses in the seminar series are starting to see improved scientific communication skills in students (compared to pre-2017 data). Because communicating scientifically is very different than writing for literature or English language classes, it will always be somewhat difficult to meet expectations for these outcomes. Students have virtually no experience with this skillset prior to beginning their science coursework, and these same students have developed some serious misconceptions about the process of science in their high school years that often cause difficulties in the college classroom. Data will continue to be collected for these outcomes, and faculty will look for additional opportunities to address these topics outside of the seminar series.

*Analyze your results and show you are seeking improvement. If this is a goal you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Changes Made/Proposed Related to Goal**

The seminar series was designed and developed to increase student proficiency in communicating science in both appropriate and effective ways. One major change that faculty will be working on again this academic year is writing and revising core rubrics for a number of our outcomes. The goal is to develop a series of basic rubrics that faculty can use as a starting point when designing assessments involving primary literature, the process of science, and scientific communication (in both written and oral forms). We plan to meet early during spring semester 2020 to discuss these rubrics, and then have these new rubrics in place in time for assessment during the 2020-2021 academic year.

*Describe changes that will be made in response to assessment results. Essential to "close the loop".*

**Upload Rubrics/Other Files**
*Please upload any rubrics or other documents used for this goal.*

## Goal 6

**Program Goals** are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

**Every Academic Program must include one goal on Program Productivity data for the South Carolina Commission on Higher Education. Information pertaining to this goal was sent by the Director of Institutional Effectiveness.**

To comply with Program Productivity standards as defined by the South Carolina Commission on Higher Education

**Pillar of Success Supported**

⦿ High-Demand, Market-Driven Programs

○ Selective, Competitive Recruitment and Enrollment of Ambitious and Talented Students

○ Robust Student Experience

○ Graduates Who Are Gainfully Employed or Admitted to Graduate School

○ Advancement Activities Leveraged to Further the University's Mission

○ Engaged and Supportive Alumni

○ Financially Stable and Operationally Efficient

○ Facilities Positioned for Growth and Efficient Utilization

○ Employer of Choice

○ Highly-Valued Community Partner

*Choose the Pillar of Success that your goal best aligns with.*

# Outcomes

## Outcome 1

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Operational Outcome

**Enter Outcome**

Major enrollment

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

Using a five-year rolling average, the number of students enrolled in the major (a) for Baccalaureate programs is greater than or equal to 12.5, (b) for Master's/First Professional is greater than or equal to 6.

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

Not Applicable

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Using a five-year rolling average, the number of students enrolled in the major (a) for Baccalaureate programs is less than 12.5 (b) for Master's/First Professional is less than 6.

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Enrollment and Graduation data extracted from Banner

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Annually

**Data Collected for this Timeframe (Results)**

176.8

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

**Comments/Narrative**

This outcome was met. There have historically been a large number of biology majors in this program (particularly during the first year). Enrollment drops off considerably after the first year, however. Many changes have recently been made to increase the number of students attending Lander at the university level, and as a result the number of students in the biology program has continued to be high. In order to increase enrollment in the biology major, the department will need additional tenure-track and non-tenure track faculty to teach the introductory courses.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

To maintain our current enrollment, one tenure-track position, one lecturer position, and at least one non-tenure track laboratory instructor position would need to be created and filled. To increase enrollment, an additional lecturer or tenure-track faculty member would be required to teach additional sections of the first year courses for our majors.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

Again this year, some of the laboratories are taught by adjunct faculty, and this is far less than an ideal situation. With the recent changes to the program, it has become increasingly important that faculty teaching the introductory laboratories have not only an excellent background in biology but a long-term interest in our students. The only way to assure this is by hiring full time faculty to teach these courses. The newly developed BIOL 111 and 112 courses are showing increased retention of students, but without additional faculty, we have no way to add additional sections of courses to meet this potential demand.

## Outcome 2

**Outcomes** are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

**Most goals have at least two outcomes measured.**

**What type of Outcome would you like to add?**

Operational Outcome

**Enter Outcome**

Completions (Degrees awarded)

**Timeframe for this Outcome**

Academic Year 2018-2019

*Ex. Academic Year 2017-2018*

**Performance Target for "Met"**

Using a five-year rolling average, the number of degrees awarded (a) for Baccalaureate programs is greater than or equal to 8, (b) for Master's/First Professional is greater than or equal to 3.

*The anticipated level of achievement for this Outcome to be considered "Met".*

**Performance Target for "Partially Met"**

Not Applicable

*The anticipated level of achievement for this Outcome to be considered "Partially Met".*

**Performance Target for "Not Met"**

Using a five-year rolling average, the number of degrees awarded (a) for Baccalaureate programs is less than 8 (b) for Master's/First Professional is less than 3.

*The anticipated level of achievement for this Outcome to be considered "Not Met".*

**Assessment Measure Used**

Enrollment and Graduation data extracted from Banner

*Tools that allow us to measure or demonstrate the extent to which outcomes have been achieved (ex. Capstone assignment).*

**Frequency of Assessment**

Annually

**Data Collected for this Timeframe (Results)**

16.4

*If this is a new outcome and no data has been collected, you should explain when data will be available for entry.*

**Score (Met=3, Partially Met=2, Not Met=1)**

3

**Comments/Narrative**

This outcome was met. While there have historically been many students in the biology major at any given time, the number of graduating seniors has fluctuated somewhat. With recent changes to the program and general education requirements, a high degree of flexibility has been added to the 4-year guides for our majors. Students will have the opportunity to choose courses to fit their specific needs, and we think this is increasing retention and graduation of students in the biology major.

*Analyze your results and show you are seeking improvement. If this is an outcome you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Resources Needed to Meet/Sustain Results**

To maintain our current enrollment, one tenure-track position, one lecturer position, and at least one non-tenure track laboratory instructor position would need to be created and filled. To increase enrollment, an additional lecturer or tenure-track faculty member would be required to teach additional sections of the first year courses for our majors.

*Include estimate of cost.*

**Explanation of How Resources Will Be Used**

Again this year, some of the laboratories are taught by adjunct faculty, and this is far less than an ideal situation. With the recent changes to the program, it has become increasingly important that faculty teaching the introductory laboratories have not only an excellent background in biology but a long-term interest in our students. The only way to assure this is by hiring full time faculty to teach these courses. The newly developed BIOL 111 and 112 courses are showing increased retention of students, but without additional faculty, we have no way to add additional sections of courses to meet this potential demand.

# Goal Summary

**Goal Summary/Comments**

Overall, the biology program easily met both outcomes for the program goal again this year. Within the department, we have recently changed our curriculum to add flexibility for students with varied career plans, and we are confident that this will not only increase retention of students but also increase graduation rates.

*Analyze your results and show you are seeking improvement. If this is a goal you have used in the past, please provide a narrative that includes an analysis of historical data and current data. Include evidence of improvement or clarification of why improvement has not been accomplished.*

**Changes Made/Proposed Related to Goal**

A number of changes have recently been made to try to increase student engagement both in the classroom and outside the classroom in the Department of Biology. Four years ago, we started an annual “Biology Bash” during the early part of the fall semester so that new students could meet and interact with returning students and faculty. Members in the biology honor society, TriBeta, are still working on plans to include more students in their events and activities. Faculty teaching the first year biology courses and the biology LINK 101 instructors are planning additional activities for our younger students. It is our hope that getting students engaged with each other outside the classroom will help to forge bonds between students and increase the sense of community and belonging to the major. Additionally, within the seminar series, faculty are working to include more information for students about job opportunities after they finish their degree. Because so many students start out as “pre-med” majors and find that they change their mind (for many different reasons), we are trying to give these students options with the hope that they will remain in the program and work in the biological sciences after graduation.

*Describe changes that will be made in response to assessment results. Essential to "close the loop".*

**Upload Rubrics/Other Files**
*Please upload any rubrics or other documents used for this goal.*