PRAC Report: Assessment of Student Learning
IUPUI School of Science
2016-2017 Report

Overview: The School of Science at IUPUI provides outstanding science education for all IUPUI students, education in depth for students in our School, and engages in fundamental and applied research in the physical, biological, mathematical, and psychological sciences to increase knowledge and advance the development of the life sciences at IUPUI and in the State of Indiana. Within the seven academic departments (Biology, Chemistry & Chemical Biology, Computer & Information Science, Earth Sciences, Mathematical Sciences, Physics, and Psychology) and the Forensic and Investigative Sciences and Neuroscience Programs, there are over 160 full-time faculty members. The School is the academic home of ~2,300 undergraduate majors and ~450 graduate students.

Part I: Student Learning Outcomes for Each Academic Program

The School of Science has been utilizing Student Learning Outcomes developed during the 2010-2011 academic year. A comprehensive list of SLOs for both undergraduate and graduate education and degree programs can be found in the IUPUI Bulletin.

Undergraduate SLOs (B.A. and B.S.)	**Graduate SLOs (M.S. and Ph.D.)**
• Biology • Chemistry • Computer and Information Science • Environmental Sciences • Forensic and Investigative Sciences • Geology • Interdisciplinary Studies • Mathematics • Physics • Psychology • Neuroscience	• Addictions Neuroscience* • Biology • Chemistry • Clinical Psychology • Computer and Information Science • Geology • Industrial Organizational Psychology • Mathematics • Physics • Applied Social and Organizational Psychology ***Previously named Psychobiology of Addictions**

How is the School of Science assessing Student Learning Outcomes and Student Learning?

The main focus of this 2016-2017 School of Science's annual report is on the efforts undertaken in the last year to refine, measure, and improve the attainment of the student learning outcomes for our programs. The following data and information provides evidence that we are assessing our programs, that we are addressing the IUPUI Principles of Undergraduate Learning and Principles of Graduate Learning, that we have deliberate and ongoing processes in place for performing these assessments of student learning, and that we are using the results to guide improvements in our programs.

Part II: Evidence of Continuous Assessment related to Student Learning Outcomes: Course and Curriculum Development or Redesign

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To prepare for the PRAC report, an email was distributed to all faculty in the SOS. The email explained the rationale for the PRAC report and requested faculty to share examples of curriculum redesign (no matter how big or small). They were asked to describe the course, the enrollment size, the change that they implemented and the noted outcome. Below are the responses received. While many of these examples do not represent highly formalized assessment, they do note ongoing adjustments and reflections that faculty are engaged in.

1. Earth Science

Course Number: G335

Number of Students typically enrolled: 18

The change you made to the course: I added a weekend field trip to collect fossils from the Cincinnati area. I coordinate the field trip with a geology colleague at IPFW who brings his students on the same field trip. On a subset of samples collected, the students conduct geochemical analyses as part of their laboratory course for the semester.

The outcome you noted: Students really enjoy the field trip. They learn to put their basic geological skills into practice by learning how to collect samples, identify different types of rocks and fossils, and how to make interpretations in the field. The IUPUI students also greatly benefit from interacting with geology students from IPFW.

How this change and outcome relates to course objectives: The field activities greatly reinforce topics discussed in class and in their laboratory. The geochemical analyses they conduct on the samples collected in the field also introduce them to many of the basic chemical tests that are common to the geological sciences.

2. Psychology

Course Assessment: Capstone Laboratory in Psychology

- Name of Course: *Capstone Laboratory in Psychology*
- Course Number: *Psy B433*
- Number of Students typically enrolled: *30*
- The change you made to the course: *The Psychology Department provided small grants (<$100) to student teams to conduct online research for the capstone projects. Each team*

designed and executed an online study and collected data from adult participants using Amazon's Mturk.

- The outcome you noted: *Students were able to conduct "real" research, obtain useable data and complete a scientific research report and presentation.*
- How this change and outcome relates to course objectives: *This change impacted the following course objectives:*

Competency Domains	**Specific Learning Objective**
PUL 1: Core Communication and Quantitative Skills **PUL 2: Critical Thinking** **PUL 3: Integration and Application of Knowledge** **PUL 6: Values and Ethics** **Professional Development**	• Develop a review of relevant literature that frames the major project and is well-organized, demonstrates psychology information literacy, and is appropriately synthesized • Interpret, design and conduct psychological research and evaluation, incorporating sociocultural factors in the process of scientific inquiry *Students developed a literature review and developed testable hypotheses* • Demonstrate effective writing and effective presentation skills in multiple formats *Students wrote an APA research paper reporting on the results of their research, and they constructed a scientific poster of the findings and made a presentation at a department-wide student capstone poster session, attended by students, faculty, family and other guests.* • Select and conduct appropriate statistical analyses on research or evaluation data and interpret the output from those analyses. • Describe and apply research methods, integrating understanding of core areas of psychology, statistics, research design, and assessment *Students learned several competencies with regard to data collection and analysis, including building an online survey with Qualtrics, collecting data with MTurk, downloading and cleaning data with Excel, and analyzing data with SPSS.* • Interact effectively with others, particularly as a member of a project team. • Enhance teamwork capability *All students worked together in teams to conduct their project.*

3. Physics

Name of Course: **Mechanics, Physics**
Course Number: **15200**

Number of Students typically enrolled: **150**
The change you made to the course: **Introduced Course Networking**
The outcome you noted: **I have done substantial analysis on this. 1 paper in print, one accepted, and one almost ready for submission, plus several posters at conferences. So far, the primary conclusions are**

1. Students use this tool to share insights, seek academic help, and provide one another mutual support.

2. The sentiments students express, as measured by text mining, is generally positive, and this result is independent of gender.

3. Sentiment is largely independent of frequency of use, that is, the most frequent users express the same sentiment as infrequent users.

4. Use of the tool is a good measure of engagement, in the sense that it is correlated with other positive measures such as class attendance, completion of assignments, and time spent on homework.

How this change and outcome relates to course objectives: **This is a large enrollment course required for students in many majors. CN helps students avoid feels of isolation and may help develop their sense of identity as engineers and scientists. Here is a quote from a student post that illustrates this point.**

i actually dropped this class last semester (bad decision) because i thought i wasn't smart enough but this cn networking helped me realize that i shouldn't of done that because i realized that lots of people were in my shoes..... just try your hardest and you won't let yourself down!

4. Physics
Name of Course: **Mechanics**
Course Number: **15200**
Number of Students typically enrolled: **150**
The change you made to the course: **Introduced two labs students can do online via simulation software**
The outcome you noted: **Many students found these more instructive than traditional labs, since equipment failure and other distractions are minimized. There is literature that supports this conclusion, which (partly) motivated this effort**
How this change and outcome relates to course objectives: **Students gained conceptual insight into Newton's laws of motion and Hooke's law (related to springs and elastic forces).**

5. Math
Name of Course: Finite Mathematics
Course Number: M118
Number of students typically enrolled: limited to 50
The change your made: Developed and implemented an on-line version of MATH M118 (Finite Mathematics).
Outcome of Change: The primary issues relate to the proctored testing component - proctored testing over the internet causes high levels of stress in students, technology

challenges, and proctors understanding the testing directions (i.e., students need scrap paper to work the problems). When these issues are resolved the course enrollment can be increased.

6. Forensic and Investigative Sciences
Name of the Course: Concepts in Forensic Science 2
Course Number: FIS 20600
Number of students typically enrolled: 80
The change you made: Active learning activities once a week in groups of 6 students
Outcome of change: Students were more engaged in the course material and excited to learn about new topics. One of the major course objectives is for students to be able to explain how a variety of instrumental techniques are applied to analyzing forensic evidence. The activities done as groups allowed students to research instrumentation and forensic evidence, share with the class, and become more informed on common forensic applications.

Part III: Department Level Projects and Initiatives

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1. Psychology – Student Learning Outcomes Project:

In 2015, the psychology department began the process of curricular assessment by revising the student learning outcomes (SLOs) for the B.A. and B.S. degrees in Psychology. See Table below. Now that this first phase has been completed, Dr. Lisa Contino is meeting with groups of faculty who teach courses required for the major, in order to develop SLOs for each course. Over the last 18 months, SLO's have been developed for the following courses: B110-Introduction to Psychology; B305-Statistics; B311-Research Methods; B310-Lifespan Development; B320-Behavioral Neuroscience; B370-Social Psychology; B454-Service Learning Capstone; B203-Ethics and Diversity; B303-Career Development; B340-Cognitive Psychology; all capstones. By the end of this year, all required courses will have relevant, assessable, agreed-upon learning outcomes.

The next and ongoing part of this process is for faculty to develop assessment indicators (e.g., signature assignments), particularly in multi-section courses. Currently, B110 is part of university-wide assessment efforts for general education courses. Beginning this academic year, the process of assessing courses in terms of how well students are attaining stated learning outcomes will begin. This will be accomplished via a variety of sources using both internal and external review of student performance on course assignments and the course as a whole.

IUPUI Department of Psychology
Students Learning Outcomes for the Undergraduate Major in Psychology

Goal 1: Knowledge Base in Psychology
Student Learning Outcomes
1.1 Describe key concepts, principles, and overarching themes in psychology

1.2 Demonstrate working knowledge of psychology's content domains (biological, developmental, cognitive, social)
1.3 Describe how concepts, principles, and themes in psychology are applied to individual, social, and organizational issues

Goal 2: Scientific Inquiry
Student Learning Outcomes
2.1 Use scientific reasoning to interpret psychological phenomena
2.2 Demonstrate psychology information literacy
2.3 Interpret, design, and conduct basic psychological research

Goal 3: Critical Thinking
Student Learning Outcomes
3.1 Generate essential questions to solve problems
3.2 Gather and assess relevant information to come to well-reasoned conclusions
3.3 Recognize and assess assumptions and biases of self and others

Goal 4: Ethical and Social Responsibility in a Diverse World
Student Learning Outcomes
4.1 Apply ethical standards to evaluate psychological science and practice
4.2 Build and enhance interpersonal relationships
4.3 Exhibit respect for members of diverse groups

Goal 5: Communication
Student Learning Outcomes
5.1 Demonstrate effective writing for different purposes
5.2 Exhibit effective presentation skills for different purposes
5.3 Demonstrate professionalism in formal and informal communication with others

Goal 6: Career Development
Student Learning Outcomes
6.1 Apply psychological content and skills to career goals
6.2 Exhibit self-efficacy and self-regulation
6.3 Develop meaningful professional direction for life after graduation

2. **Assessment of Introductory Psychology B110**. Historically, Introductory to Psychology was taught in a two course sequence focused on the social aspects of behavior and the biological aspects of behavior (B104 and B105 respectively). Around 2007, the DFW rates for this course were close to 50% (47% for B104; 32% for B105). At this point the department made considerable efforts through course modifications to better engage students and the rates improved (dropped) to 27% by AY 12 for B104 and 23% for B105.

In 2012, Drs. Contino and Neal-Beliveau received a course enhancement grant through CTL and developed B110 (which combines the material in B104 and B105). This new course was offered for the first time in Fall 2012. Changes to the course included our new departmentally written interactive eBook, an improved course format that allowed for more face-to-face time with the instructor than B104 offered, more hands-on collaborative in-class activities, and a new critical

thinking personal reflection assignment that required students to apply course themes and concepts to their own lives. The course also relies on undergraduate peer mentors who offer support in the classroom and help for students in the Psychology Resource Center. We have a steady group of faculty, consisting mainly of lecturers and long-time adjunct instructors, who teach the course.

In Fall 2015 we moved B110 from Oncourse into Canvas. This involved a redesign of several major aspects of the course. Students now take a pre-class quiz before beginning a new chapter and a more challenging chapter quiz at the end of each unit. These assessments were incorporated based on research on the testing effect, demonstrating the benefit of frequent quizzing on retention of material. They also naturally encourage spaced practice and preparation before class. Analyses reveal that pre-class quiz scores are significantly correlated with scores on chapter quizzes, class participation, exams, reflection papers, and final grades. Chapter quizzes are also strongly correlated with class participation, exams, reflection papers, and final grades.

Given the large enrollment in this class, it was important to develop a mechanism by which to ensure that students were achieving the important critical thinking skills we hope they gain. The final personal reflection assignment is a way to assess this aim. The course coordinator, Dr. Debbie Herold has developed this assignment, plus a highly descriptive grading rubric to ensure continuity of grading across course sections.

In spring 2017, this was one of two pilot courses to go through the Gen Ed review process.

Student Learning Outcome	**IUPUI Principle(s) of Undergraduate Learning**	**Statewide Competency Domain and Learning Outcome**	**Mechanism for Assessing Student Learning to Determine that Outcome Has Been Achieved**
Identify vocabulary and connect to key concepts from each content domain in psychology.	PUL 4 Intellectual Depth, Breadth and Adaptiveness	5. Social and Behavioral Ways of Knowing (5.1)	Exams Quizzes In-class activities Personal reflection assignments
Apply the goals of psychology (describe, explain,	PUL 4 Intellectual Depth, Breadth and	5. Social and Behavioral Ways	In-class activities Personal reflection assignments

predict, and change) to your behavior and the behavior of others.	Adaptiveness	of Knowing (5.4)	
Apply psychological principles to everyday life.	PUL 4 Intellectual Depth, Breadth and Adaptiveness	5. Social and Behavioral Ways of Knowing (5.4, 5.5, 5.6)	Exams Quizzes In-class activities Personal reflection assignments
Identify basic biological, psychological, and sociocultural components of behavior and mental processes.	PUL 4 Intellectual Depth, Breadth and Adaptiveness	5. Social and Behavioral Ways of Knowing (5.5)	Exams Quizzes In-class activities Personal reflection assignments
Describe how psychologists use scientific methods to study behavior and mental processes.	PUL 4 Intellectual Depth, Breadth and Adaptiveness	4. Scientific Ways of Knowing (4.1)	Exams Quizzes In-class ac Research requirement

Express ideas in written formats that accurately reflect basic psychological concepts and principles.	PUL 1 Core Communication and Quantitative Skills	1. Written Communication (1.1, 1.3, 1.5)	In-class activities Personal reflection assignments
Recognize and assess assumptions and biases of self	PUL 2 Critical Thinking	5. Social and Behavioral Ways	In-class activities Personal reflection assignments

and others.		of Knowing (5.5)	

3. Evaluation of Biology Majors Field Test (BioMFT)

The Department of Biology recently completed an analysis of graduating senior biology majors. Graduating seniors were encouraged to take this national test provided by ETS. Over the last two years (Fall 2015-Spring 2017), 162 students took this 150 multiple choice item exam.

Briefly, the average score by the students is nearly identical to that nationwide average. However, these students were better in certain sub-disciplines than others. In comparison to other students, these students have higher scores than:
45% of all examinees;
50% of all examinees in cell biology;
58% of all examinees in molecular biology and genetics;
42% of all examinees in population biology, evolution, and ecology;
33% of all other examinees in organismal biology.

This year, the Biology Undergraduate Education Committee will be analyzing these data in greater detail with regards to our undergraduate program, the structure of our curriculum, and the needs of the majors.

4. The IUPUI Stem Education and Innovative Research Institute Grant Program

3 SOS Faculty received a SEIRI Seed Grant. The purpose of these grants is to research innovative techniques for delivering STEM Education.

- Normalizing Computation in Undergraduate Physics Curriculum. Yogesh Joglekar (PI), Gautam Vemuri
- Research-Based Implementation of CUREs in Biology: Evaluating CUREs as a Model for Persistence and Success in Undergraduate Science Majors and as a Model for Accelerating Departmental Change among Faculty Teams. Kathy Marrs (PI), James Marrs
- Development of a Peer-Led Undergraduate Research Initiative (PLURI) Module in Organic Chemistry Teaching Laboratory. Robert Minto (PI), Sebastien Laulhe

Part IV: Evidence of assessment and changes made towards continuous improvement in student success initiatives and student support services.

1. Continuation and Expansion of Summer residential STEM Bridge program designed for students who will be residents on campus. There were several positives to

the residential STEM bridge program. Students living in the same buildings had an opportunity to get to know one another before the semester began and there was more interaction as the semester continued. The number of students participating in the STEM, Science and Psychology Bridge programs continues to increase each year. Recent data indicates that STEM and other bridge participants have higher GPAs compared to non-participants; students participating in Summer Residential STEM Bridge have lower DFW rates compared to non-participants; and minority students (especially African Americans) participating in Summer STEM Bridge obtained higher GPAs, lower DFW rates and higher Fall-to-Fall retention rates compared to non-participating AA students. Based on an end of the semester assessment for Science Bridge participants, students are meeting the stated IUPUI Bridge Learning Outcomes:

- Develop a perspective on higher education
- Develop a community of learners
- Develop communication skills
- Develop critical thinking skills
- Develop study skills
- Develop college adjustment skills
- Understand the demands and expectations of college
- Understand information technology
- Understand and use university resources

2. Continuation of the Physics Learning Space (PhyLS)

In order to reduce the DFW rates in Physics, PhyLS has adopted the "assistance center" model that has proven successful in Math, Chemistry and Biology. Since its opening, the PhyLS or "Phyllis" as it is known, has proven to be a popular destination for many students. Students are able to interact with mentors and faculty in small groups or one-on-one, focus on the areas that cause them the most trouble, receive individual support, guided access to computer simulations, video analysis software, and other online tools that support learning in physics.

Department of Physics expanded the hours (the PhyLS is now open 42 hours/week) after its initial success, and has made an attempt to increase physical space by adding an "overflow whiteboard" to the corridor outside (unfortunately, no larger rooms are available) and by adding a second mentor during peak hours. Students, faculty and tutors have all had positive reactions to the PhyLS. Typical student comments focused on the "peer" aspect, fining that the help they get from other students is often more accessible than that from faculty.

Student use of the learning space has remained rather constant across the first 5 years. Visits to the PhyLS typically number 700-800/semester and just over 300 in the summer, with the mean stay being over one hour. Initial assessment showed that students are highly positive about almost all aspects of PhyLS, based on a Likert scale survey was conducted in May 2013 by a campus evaluator.

3. School of Science PREPs (Pre-Professional and Career Preparation for Science Students):

The Science Career Development Services moved to the new University Tower space (HO 200) in July 2013, launching their name as "PREPs" Pre-Professional & Career Preparation for

Science Students" (SciencePREPs.iupui.edu), which has positioned the center as a key resource for Science students. One of the initial goals of the new Director was to increase the awareness of the center, its location, and services provided. The center was promoted through various programs and methods. Although only two employees initially staffed the center, outreach to hundreds of undergraduate and pre-professional students, has been successful. As of fall 2017, the office continues to have 4 full-time staff and several part-time student workers.

There were several goals in the SOS Strategic Plan that are directly related to the PREPS office

1) 835 students were served in one-on-one student advising sessions. The most frequent topic was pre-professional advising (13.5%)
2) PREPs staff made more than 47 club and classroom presentations; classroom presentations increased by 28.6% last year.
3) Preps brought in over 230 employers and graduate/professional school representatives for career fairs, information sessions and programming.
4) Partnered on Career Connection STEM Fair and coordinated the School of Science Next Step fair reaching more than 900 students through both events.
5) The applied Science internships Program (ASIP) was piloted in the spring 2017 and had 9 science interns working at three different sites across Indianapolis.
6) In 2016-17 students participated in 54 credit-bearing internships and approximately 30 other students participated in non-credit internships.
7) First destination graduation data from Class 2016 which includes August 2016, December 2016, and May 2017. The survey data reveal an 64% knowledge rate (national requirement is 65-85%).
8) 73.2% of science students felt their post-graduate positions was related to their field of study. 50.7% of science students reported doing at least one internships and 42.7% participated in student employment.

SCHOOL OF SCIENCE FIRST DESTINATION 2016-2017		
Primary Plan	**N**	**Percentage**
Employed (includes fellowships and internships)	155	51.5%
Job Seeking	35	11.3%
Continuing Education (graduate and professional school)	90	25.9%
Planning to Enroll in grad school (Gap year)	32	10%
Other (Army, Volunteering, etc.)	4	12%
No Information Available	187	36%

5. Development of Learning Outcomes for School of Science RBLC's.

The SOS currently has 4 unique living and learning locations for students;

STEM Floor – North Hall

WISE (Women in Science and Engineering) Wing – North Hall
WISH (Women in Science House)
Purdue House

We have developed both common and unique learning outcomes for each location.

As a result of living in a STEM RBLC, residents will be able to:

- Choose at least one School of Science and/or School of Engineering and Technology involvement opportunity of interest (school student organization, school social event, school lecture, etc.)
- Examine STEM career opportunities
- Identify STEM research opportunities
- Describe STEM campus and community resources
- Name a new STEM faculty, staff member, and/or industry leader they met as a result of an RBLC program

Community Specific Outcomes:

- *STEM Floor*
  - Discuss college level academic expectations of a STEM major (study skills, time management, etc.)
  - Identify a social issue that STEM research and work can influence
- *STEM Floor WISE Wing*
  - Connect with a new female STEM faculty, staff member, and/or industry leader
  - Identify issues facing women in STEM on college campuses and/or in the workplace
- *WISH:*
  - Connect with a new female science faculty, staff member, and/or industry leader
  - Identify issues facing women in science on college campuses and/or in the workplace
  - Describe a contribution of a women scientist in their field of study
- *Purdue House*
  - Describe the influence of STEM research and work on a community issue
  - Develop an academic plan for their remaining semesters of coursework

Last academic year, we tried to assess student perceptions of goal attainment through the end of the year survey distributed by IUPUI Residential Life. Unfortunately, the response rate was too low to provide meaningful data. We plan to assess these outcomes throughout this current academic year.

Part V: Graduate Program Assessment

1. Program Overview: Graduate programs at the Ph.D. and M.S. level are advanced fields of study that provide new knowledge in areas unique to the specialization of particular faculty members within research disciplines. At the graduate level overall, however, there are generally similar educational outcomes that are usually independent of the specific field of scientific study. IUPUI has a series of Principles of Graduate Learning (PGLs) that form a conceptual framework that describes expectations of all graduate/professional students at IUPUI. Virtually all graduate students in almost all disciplines are assessed on:

(a) Ability to undertake appropriate research, scholarly or creative endeavors, and contribute to their discipline;
(b) Demonstrating mastery of the knowledge and skills in an advanced area expected for the degree and for professionalism and success in the field
(c) Thinking critically, applying good judgment in professional and personal situations
(d) Behaving in an ethical way both professionally and personally"
(e) Ability to teach, often at the undergraduate level; and
(f) Communicating effectively to others in the field and to the general public
(g) Success in finding employment in a field related to their graduate work.

Together, these PGLs are expectations that identify knowledge, skills, and abilities graduates will have demonstrated upon completing their specific degrees.

2. Program Outcomes: In general, graduate programs in the School of Science assess M.S. and Ph.D. students through comprehensive written and/or oral examinations by a committee related to their field of study, and regular committee meetings to discuss research progress and mastery of skills and knowledge. Graduate students often teach in the department, and they are assessed on their ability to teach by the campus Student Satisfaction of Teaching survey that all faculty receive. Depending on the department, the Teaching Assistants may receive peer evaluation, if teaching. Their record of presentations at meetings, invited talks, publication and submission for grants or fellowships is also a means of assessment, and contributions to the scholarly literature both during and several years immediately after graduation similarly have are used as a form of program assessment.

The School of Science has been working for several years to have the doctoral program site approved on this campus. Previously, doctoral work completed on this campus was partially overseen (this varied by department) by faculty from Purdue and the graduates were counted as Purdue graduates. Given the development and increasing quality of our graduate programs in our school, we were encouraged to seek sight approval from the Indiana Higher Education Commission. After a two-year process, all Purdue doctoral programs (e.g., Biology, Chemistry, Computer Science, Mathematical Sciences, Physics and Psychology) in the School of Science are independent and site approved for our campus. In addition, a new IU doctoral program in the department of psychology, Applied Social and Organizational Psychology, was approved and brought in its inaugural class this fall. This program joins IU doctoral programs from earth science and bio-statistics that are offered within the school of science.

Evaluation of these undertakings by committees of graduate faculty remains the ultimate assessment standard of student success at the graduate level. These metrics are generally found

to be an academically acceptable method of capturing most of the information necessary for graduate student assessment. In terms of final numbers, approximately 169 students earned the M.S or Ph.D. in the School of Science in 2016-2017.

Part VI: Assessment Plans for 2016-2017

Assessment Committee Plans For 2016-2017: The creation of cohorts and tracking their performance through the pipeline to graduation has proved to be a challenge, but with the progress the School has made as a result of the STEP grant, we have been better able to track cohorts and chart their progress towards graduation, as well as gather data necessary to determine whether our students are not only meeting the standards set by the PULs but also developing the skills needed for graduate or professional school or a career after college. Currently, we are collecting the following data on each cohort for both first-time freshman and transfer students (by gender, race, FT/PT, etc.):

1) Average GPA each year for cohort
2) Track those who attended a STEM or other Science Bridge, First year Experience or Themed Learning Community, and assess the impact of student persistence and retention
3) Track number who changed major, but dropped STEM major each year
4) Track students in each cohort involved with each student resource center (BRC, CRC, MAC, PhyLS), and compare their DFW and retention rates as well as graduation rates to others in cohort
5) Track number who use Career Development Services
6) Track the number of students who complete 2 or more RISE experiences

We will also continue to assess the effects of course development and course transformation efforts in the School of Science such as Chemistry PLTL workshops, Math, Biology, and Physics Recitations, CUREs in Biology and Chemistry, and Psychology.