Reimagining Introductory Biology: A Pilot Study
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BACKGROUND
The Illinois Mathematics and Science Academy’s Office of Institutional Research is conducting a three-year pilot study to enhance teaching and learning of complex biological concepts, as well as to improve student outcomes by comparing and contrasting the effectiveness of a new, one-year introductory Biology course, Advanced Biological Systems (ABS), with the traditionally offered one-semester Scientific Inquires – Biology (SI-Biology) course.

METHODS
Sampling Procedure: Students in the Classes of 2020 and 2021 have been/will be randomly assigned to either the treatment group (ABS) or the control group (SI-Biology) using stratified random sampling. The strata of interest include the following:
- Gender
- Race/ethnicity

Measures of Students’ Incoming Skill Levels, Outcomes, and Engagement:
- Admissions portfolio (SAT scores, GPA, Admissions score)
- Biology content knowledge pre- and post-test
- Biology Motivation Questionnaire II
- Course grades in biology & subsequent science classes
- CWRA+ (College Work & Readiness Assessment)
- Elective-taking patterns across the sciences
- Retention rate

GROUP ASSIGNMENT – CLASS OF 2020 (N = 249)

There were no significant differences between incoming skill levels for students in ABS and SI-Biology (SAT scores and GPA).

STRATIFIED RANDOM SAMPLING RESULTS

The ABS course design allocates more time to meet the above principles and in addition emphasizes students’:
- Interaction with real world problems
- Exploration of the utility of science
These principles have been proven to positively influence students’ attitudes toward and engagement with science.