

Research supporting a PCB sequencing, 1 - Examples

Bouma, 2013	Cohort study. N=571. The PCB program had a significant impact on SAT math scores in the second cohort at MRHS. Statistically adjusted, the SAT math means for PCB students were 21.4 points higher than their non-PCB counterparts when controlling for prior math achievement, socioeconomic status, and ethnicity/race.
Glasser, 2012	Cohort study. Students taking the freshman physics showed positive effects on their mathematical performance on standardized tests .
Pasero, 2008	Quasi-experimental study, self-selection into either the BCP or PCB sequence. N=185. Gain scores between the EXPLORE and PLAN were calculated for the composite scores and for the science and mathematics subscale scores. A two-factor analysis of variance (ANOVA) on course sequence and cohort showed significantly greater composite score gains by students taking the inverted sequence.
Gaubatz, 2013	Cohort study. N by cohort = 7. The modified-PCB program transition was associated with increases in students' honors and Advanced Placement (AP) course enrollments, AP examination scores, understanding of the Nature of Science and experimentation, and self-reported affect toward themselves as learners and toward science in general .
Bouma, 2008	Natural/quasi-experimental study. N=168 The analysis indicates that the freshmen scored as well as their senior counterparts on the California Standards Test in Physics and on par with typical high school scores on the Force Concept Inventory .

Research supporting a PCB sequencing, 2 - Examples

Burgess, 2019	Quasi-experimental study. N= 1100. The transition to a PCB sequence resulted in immediate, rapid, statistically significant, large increases in every ACT section with scores rising during the transition and sustained for four years after the transition to the new sequence of science courses.
Burgess, 2013	Quasi-experimental study. N by cohort = 10. AP Science course enrollment increased 398% when comparing the four years prior to the change in sequence to the four years after the change in sequence. AP Science Exam performance displayed a 259% increase when comparing the four years prior to the change with the three years after the change in science course sequence.
JK, 2012 Popkin, 2009	Two summaries of why physics first program fail : Lack of teacher training, implemented in a top-down fashion, unsupportive community, easier to implement in smaller, independent, private, or magnet schools than public schools (“...in the public school system, inertia rules”), in San Diego, 20 of the district’s 27 high schools <i>continue to offer physics to at least some ninth-graders</i> .
Lovell, 2010	Quasi-experimental. N by cohort = 15. Impact of freshman physics on the involvement and performance of girls. Of those students who took biology first before the new program was initiated, only 24% graduated with a physics course on their transcript and only 43% took more than the required three years of science. Of the students who took an introductory physics course in ninth grade, 27% went on to take the advanced physics course and 74% took four years of science .