Topic D

Drawing Conclusions Using Data from an Experiment

S-IC.B.3, S-IC.B.5, S-IC.B.6

Focus Standards:	S-IC.B.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
	S-IC.B.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
	S-IC.B.6	Evaluate reports based on data.
Instructional Days:	8	
Lesson 23:	Experiments and the Role of Random Assignment (P)[1]	
Lesson 24:	Differences Due to Random Assignment Alone (P)	
Lessons 25–27:	Ruling Out Chance (P,P,P)	
Lessons 28–29:	Drawing a Conclusion from an Experiment (E,E)	
Lesson 30:	Evaluating Reports Based on Data from an Experiment (P)	

This topic focuses on drawing conclusions based on data from a statistical experiment. Experiments are introduced as investigations designed to compare the effect of two treatments on a response variable. Students revisit the distinction between random selection and random assignment.

When comparing two treatments using data from a statistical experiment, it is important to assess whether the observed difference in group means indicates a real difference between the treatments in the experiment or whether it is possible that there is no difference and that the observed difference is just a by-product of the random assignment of subjects to treatments (**S-IC.B.5**). To help students understand how this distinction is made, lessons in this topic use simulation to create a randomization distribution as a way of exploring the types of differences they might expect to see by chance when there is no real difference between groups. By understanding these differences, students are able to determine whether an observed difference in means is significant (**S-IC.B.5**).

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[1]Lesson Structure Key: **P**-Problem Set Lesson, **M**-Modeling Cycle Lesson, **E**-Exploration Lesson, **S**-Socratic Lesson

Students also critique and evaluate published reports based on statistical experiments that compare two treatments (**S-IC.B.6**). For example, students read a short summary of an article in the online *New England Journal of Medicine* describing an experiment to determine if wearing a brace helps adolescents with scoliosis. Then, they watch an online video report for the *Wall Street Journal* titled "BMW Drivers Really Are Jerks" that describes a study of the relationship between driving behavior and the type of car driven.