PARCC
Partnership for Assessment of
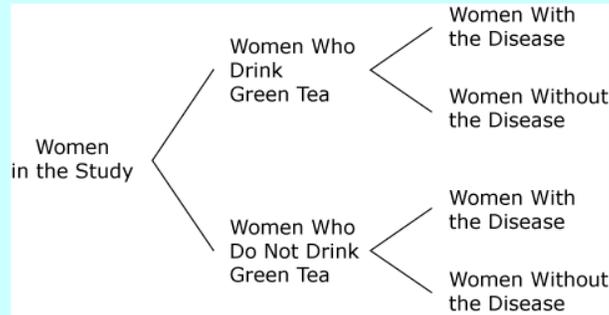Readiness for College and Careers

In an observational study, a researcher collected data from 70,000 non-smoking women aged 40-years or older in China who volunteered for the study. The researcher made a sketch to represent the study as shown.

Part A

Women in the study who drank green tea had a statistically significant lower rate of a certain disease than women who did not drink green tea.

Use the drop-downs to complete a valid statement about the conclusions that can be made on the basis of the result of the study.

From this study, it can be concluded that drinking green tea [▼] a

| causes |
| is associated with |

difference in the rates of the disease and this result of the study can be generalized to

[▼] .

| the women in the study only |
| non-smoking women in China aged 40-years and older only |
| all non-smoking women in China |

Part B

To further investigate the relationship between drinking green tea and the disease rate, the researcher decides to conduct a statistical experiment with 70 non-smoking women in China who did not participate in the observational study.

Use the drop-down menus to complete valid statements about the experiment.

In this experiment, participants in the treatment group should
[▼] .

The participants in the control group should [▼] .

The participants should be assigned to the groups
[▼] .

| be asked to drink green tea |
| be asked to not drink green tea |
| have the disease |
| not have the disease |

| at random |
| based on whether they like green tea |
| based on the group in which they want to participate |

NOTE: These choices are the same for the first two drop-down menus.

Algebra 2 and Math III	Green Tea Observational Study
Item Type	Type I – 2 point
Evidence Statement	**S-IC.3-1:** Recognize the purposes of and differences among sample surveys, experiments, and observational studies. Clarifications for S-IC.3-1: i) The "explain" part of standard S-IC.3 is not assessed here; See Sub-claim D for this aspect of the standard. ii) See GAISE report, Guidelines for Assessment and Instruction in Statistics Education (GAISE) Report.
Most Relevant Standards for Mathematical Content	**S-IC.3:** Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. This standard is major content in the course based on the PARCC Model Content Frameworks.
Most Relevant Standards for Mathematical Practice	This is a MP.4 task assessing S-IC.3 which is a modeling standard as indicated by the star symbol (*).
Item Description and Assessment Qualities	The first part of this task requires students to analyze the methods of an observational study and relate the methods to the inferences that can be made on the basis of the result of such studies. In the second part, students are required to identify three major components of sound statistical experiments: well-defined treatments, appropriate experimental units to which these treatments can be assigned and random assignment of treatments to experimental units. The Standards and the GAISE Report require statistics education so that students can be prepared for colleges and careers that increasingly interact with situations like the one described here. Informed consumers of information need to know the limitations of a study based on methodology so that incorrect assumptions are not made simply based on the size of the sample or prestige of the researchers.
Scoring Information	Part A – 1 point: Student chooses "is associated with" and "the women in the study only". Part B – 1 point: Student chooses "be asked to drink green tea"; "be asked to not drink green tea"; and "at random."