

1.
 - a. Label each employee with a unique number from 1 to 9,000. Use a random number generator to generate 300 numbers between 1 and 9,000 with no repeats. Send the survey to each employee that corresponds to the numbers that are generated.
 - b. The random sample should be representative of the population of all employees, so the CEO can generalize the conclusions from the sample to all employees.
2.
 - a. All teachers in the United States
 - b. All high school teachers in Michigan
 - c. All high school teachers at the education conference
 - d. The results cannot be generalized to any population beyond the teachers in the voluntary response sample.
 - e. The results cannot be generalized to any population beyond the teachers in the convenience sample.
3.
 - a. The study is an observational study because treatments were not imposed on the teens. The researchers asked the teens about their social media use and did not assign them to certain levels of social media use.
 - b. No, this is not an experiment with random assignment, so we can't make conclusions about causation.
 - c. Give each teen a unique label from 1 to 80. Use a random number generator to select 40 numbers from 1 to 80 (no repeats). Assign the corresponding teens to use social media for five hours per day. The remaining 40 teens will be assigned to only one hour or less of social media per day.
4.
 - a. The explanatory variable is whether or not a person volunteers. The response variable is mortality rates.
 - b. Yes, there was a random sample of 10,317 people in Wisconsin. No, there was not random assignment.
 - c. For all people in Wisconsin, there is an association between whether or not a person volunteers and mortality rates.
5. For these 16 astronauts, getting a low-dose of caffeine and exposure to blue-enriched white light caused their robotic arm task performance to improve.
6. C
7. D