

Lesson 2 Practice Problems

1. What type of study would you conduct if you wanted to know how many hours a week on average students at your school spend on homework? Explain your reasoning.

2. Select **all** designs which describe an observational study that is not a survey.
 - A. 200 voters are randomly selected and asked how they will vote in the upcoming election.
 - B. 60 pieces of lumber are randomly selected. Half of those are randomly assigned to be treated with a new sealer. Three months later the level of rotting in all the pieces is recorded.
 - C. 100 pregnant women are randomly selected. For 8 weeks, the level of iron in their blood and their vital signs are recorded.
 - D. 400 incoming sixth grade students are randomly selected. Researchers record their results on a reading test at the beginning and end of the school year and compare the level of improvement seen in students at elementary schools to students at middle schools.
 - E. 300 people apply to test a new mattress. 100 of these customers are selected randomly to receive the new mattress and the others are given an older version. After 6 months they are asked to rate their satisfaction with the mattress.

3. In an observational study, it was noticed that people that eat more chocolate tend to have better blood flow than the general population. Researchers wonder whether the improved blood flow might be caused by flavanols (a molecule found in many foods). Dark chocolate contains a high concentration of flavanols, but milk chocolate contains a much lower concentration. How could the researchers design an experiment to determine the effects of flavanol on blood flow from the different types of chocolate?
4. What is one major difference between an observational study and an experimental study?

(From Unit 7, Lesson 1.)

5. Tyler is interested in how different environments affect dandelion plants. For a science fair project, Tyler looks for dandelions growing in the grass and growing in dirt without grass. He counts the number of days it takes each dandelion to turn from a yellow flower into seeds. After 6 weeks, he compares the number of days it takes for the dandelions growing in the grass to turn from a yellow flower into seeds to the number of days it takes for the dandelions growing in the dirt without grass to turn from a yellow flower into seeds.
- What type of study is Tyler designing?
 - How could his design be improved to collect data that would be better for answering the question of interest?

(From Unit 7, Lesson 1.)

6. For physics class, Jada wants to know how the surface of different ramps affects the maximum speed of a marble being rolled down the ramp. To study this, she compares the maximum speed of a marble rolled down ramps with different surfaces. She rolls the same marble down each type of ramp 10 times. What type of study is this?

(From Unit 7, Lesson 1.)