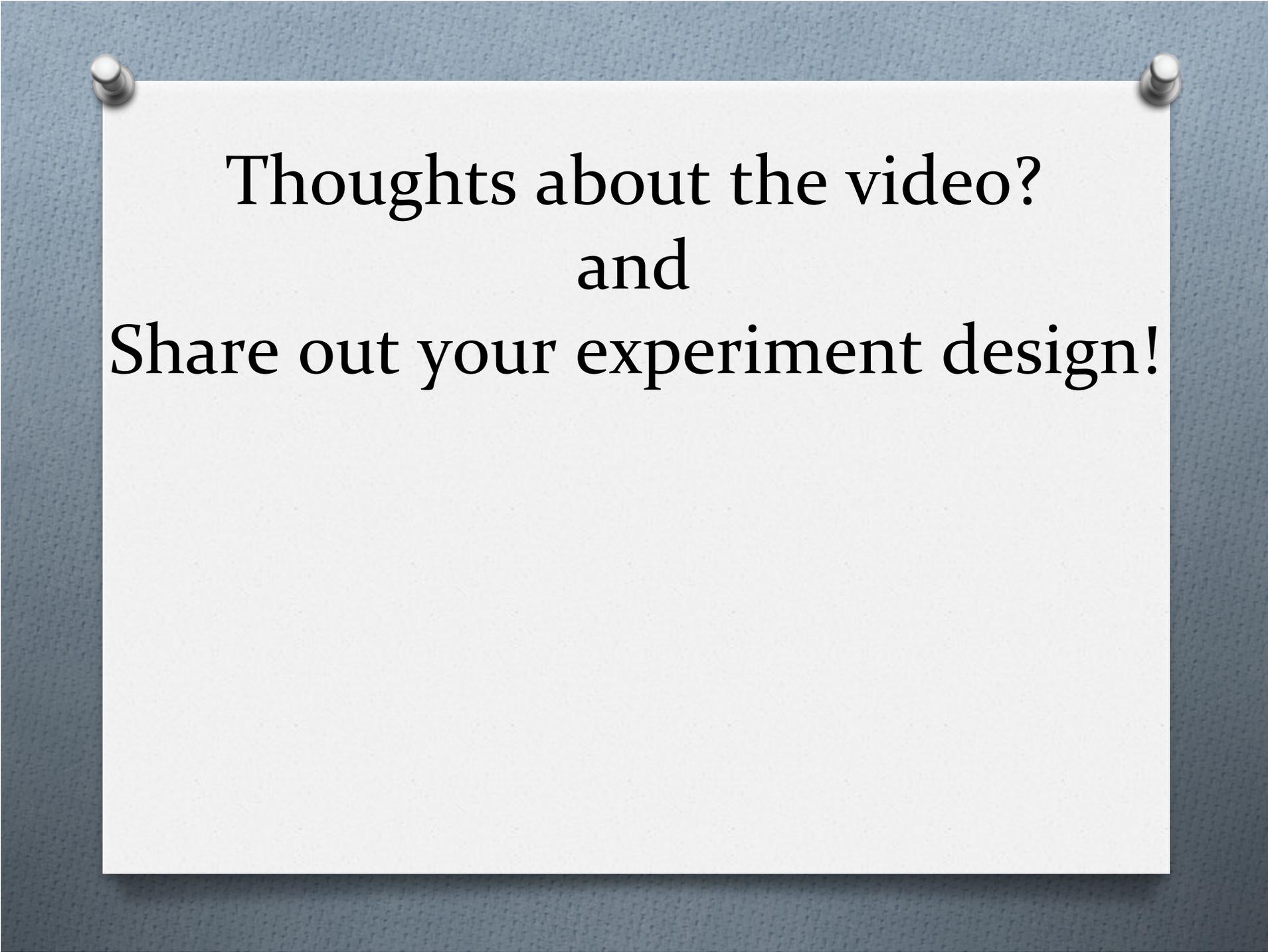


AP STATS: WARM-UP

Please have your HW journal on your desk, opened to the correct page. Answer the following 2 questions.

- 1.) You have decided that you want to determine which beach MB HS students prefer in RI. How could you go about determining the answer to this question. Be specific.
- 2.) You believe that HS students who eat breakfast in the morning have higher GPA's at MB. How could you test this hypothesis? Be specific.



Thoughts about the video?
and
Share out your experiment design!

Results from our study...

I tabulated the results from the Coke/Pepsi and Fiji/Tap water studies. Our results are statistically significant. Here are the basic findings. There was a 0.6% chance that the results we found were due to chance for the Coke/Pepsi study (this is called the p-value in statistics). In other words, we can be 99.4% sure that the results we found were not merely due to chance. This suggests that on average, my AP stats class can in fact tell the difference between Coke and Pepsi.

For the tap water/Fiji study the results are even more pronounced. There was only a 0.02% chance that the results we saw were due to chance. In other words, we can be 99.98% confident that the results we saw were not due to chance. This means that we can pretty conclusively say that our class could tell the difference between tap water and Fiji bottled water.

Video of the Day

o The Monty Hall Problem Explained.



Data Production

- o Data beats personal experience.
- o Example: You hear about an airplane crash that kills 243 people and decide that it might not be safe to fly.

Producing Data

3 Major Types of Statistical Designs:

Surveys, experiments, observational study.

Survey:

- Select a sample to represent a larger population.
- Ask some questions and record responses.
- Use the sample to draw conclusions about the population

Example

Having kids or not?

Good and bad survey results

The advice columnist Ann Landers once asked her readers, "If you had it to do over again, would you have children?" A few weeks later, her column was headlined "70% OF PARENTS SAY KIDS NOT WORTH IT." Indeed, 70% of the nearly 10,000 parents who wrote in said they would not have children if they could make the choice again. Do you believe that 70% of all parents regret having children?

You shouldn't. The people who took the trouble to write Ann Landers are not representative of all parents. Their letters showed that many of them were angry at their children. All we know from these data is that there are some unhappy parents out there. A statistically designed poll, unlike Ann Landers's appeal, targets specific people chosen in a way that gives all parents the same chance to be asked. Such a poll later showed that 91% of parents would have children again.

The lesson: if you are careless about how you get your data, you may announce 70% "No" when the truth is close to 90% "Yes."

Observational Study vs. Experiment

- A survey is one type of observational study.
- In an observational study, we observe individuals and measure variables of interest, but do NOT attempt to influence responses.
- Experiment: We deliberately do something to individuals in controlled groups in order to observe their responses.
- Observational studies are very useful tools, but when we want to determine cause and effect, experiments are the best source of convincing data

Observation vs. Experiment

Estrogen and heart attacks

Observational study versus experiment

Should women take hormones such as estrogen after menopause, when natural production of these hormones ends? In 1992, several major medical organizations said "Yes." Women who took hormones seemed to reduce their risk of a heart attack by 35% to 50%. The risks of taking hormones appeared small compared with the benefits.

The evidence in favor of hormone replacement came from a number of studies that simply compared women who were taking hormones with others who were not. But women who chose to take hormones were typically richer and better educated, and they saw doctors more often than women who did not take hormones. These women did many things to maintain their health. It isn't surprising that they had fewer heart attacks.

Experiments were needed to get convincing data on the link between hormone replacement and heart attacks. In the experiments, women did not decide what to do. A coin toss assigned each woman to one of two groups. One group took hormone replacement pills; the other took dummy pills that looked and tasted the same as the hormone pills. All kinds of women were equally likely to get either treatment. By 2002, several experiments with women of different ages showed that hormone replacement does *not* reduce the risk of heart attacks. The National Institutes of Health, after reviewing the evidence, concluded that the earlier observational studies were wrong. Taking hormones after menopause fell quickly out of favor.³

HW #3: Chapter P: Data Production

Pg. 11 #P1-P5

Read Chapter P: Data Production (Pg. 6-10).

Get started on your HW answering the following questions with your classmates