

Need 30 cards per  
pair.

## Agenda

12.1 Introductory Activity

Let's talk AP Stat Shirts

Start individual chapter reviews  
for AP Exam using "Strive For Five"

## 12.1 Introductory Activity

Do students who choose to sit toward the front of a class tend to get higher grades ??

Could location affect their grades ?

in classes where there are no seating charts that is.

Data from a class in Michigan is on the handout.

### Lesson 12.1: Day 1a: Does seat location matter? Part 1



Row	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3
Score	76	77	94	99	88	90	83	85	74	79	77	79	90	88	68	78	83	79

Row	4	4	4	4	4	4	5	5	5	5	5	5
Score	94	72	101	70	63	76	76	65	67	96	79	96

work through the front side.

Row	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3
Score	76	77	94	99	88	90	83	85	74	79	77	79	90	88	68	78	83	79

Row	4	4	4	4	4	4	5	5	5	5	5	5
Score	94	72	101	70	63	76	76	65	67	96	79	96

- Is this an observational study or an experiment? Why?
- Why is it important to randomly assign the students to seats rather than letting each student choose his or her own seat?
- How many variables are we measuring? \_\_\_\_ Are they categorical or quantitative?  
 What is the explanatory variable (x)? \_\_\_\_ Response variable(y)? \_\_\_\_

Row	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3
Score	76	77	94	99	88	90	83	85	74	79	77	79	90	88	68	78	83	79

Row	4	4	4	4	4	4	5	5	5	5	5	5
Score	94	72	101	70	63	76	76	65	67	96	79	96

1. Is this an observational study or an experiment? Why?

Experiment - a treatment (row) is imposed.

2. Why is it important to randomly assign the students to seats rather than letting each student choose his or her own seat?

It allow us to show causation.

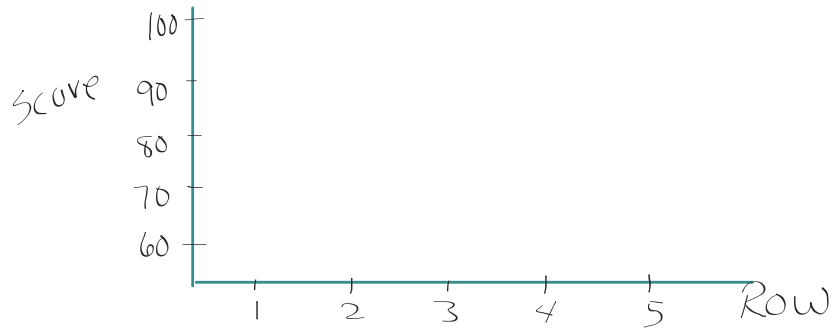
3. How many variables are we measuring? 2 Are they categorical or quantitative?

What is the explanatory variable (x)? Row Response variable(y)? score

TEXAS INSTRUMENTS

1-Var Stats
$\bar{x}=81.4$
$\Sigma x=2442$
$\Sigma x^2=201898$
$Sx=10.37104723$
$\sigma x=10.1967315$
$\downarrow n=30$

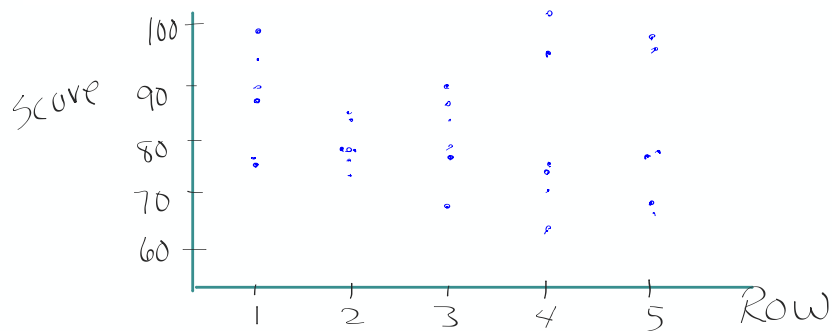
4. Use stapplet.com or your GDC to make a scatterplot. Sketch it below.



5. Find the least squares regression line (LSRL): \_\_\_\_\_

6. What is the slope of the LSRL: \_\_\_\_\_ Interpret the slope in the context of the problem.

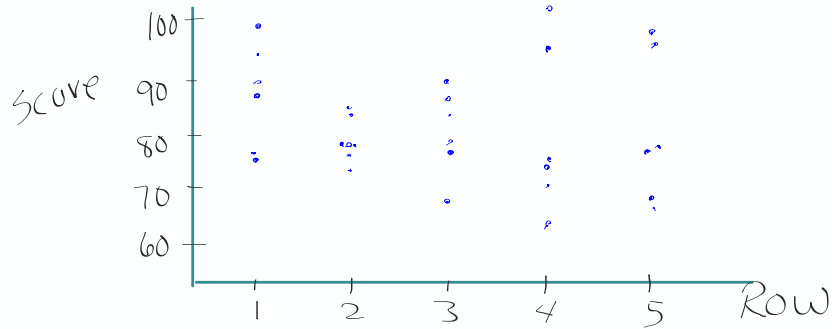
4. Use stapplet.com or your GDC to make a scatterplot. Sketch it below.



5. Find the least squares regression line (LSRL):  $\widehat{\text{Score}} = 85.95 - 1.517(\text{Row})$

6. What is the slope of the LSRL: -1.517 Interpret the slope in the context of the problem.

4. Use stapplet.com or your GDC to make a scatterplot. Sketch it below.



5. Find the least squares regression line (LSRL):  $\widehat{\text{score}} = 85.95 - 1.517(\text{Row})$

6. What is the slope of the LSRL:  $-1.517$  Interpret the slope in the context of the problem.

For each additional row, the predicted score goes down by 1,517 points.

Are you convinced that row impacts final exam score?

We need to find out how likely it is that this slope occurs purely by chance if row has no affect on scores.

time for simulation



Sampling distribution  
of the slope

7. Does the negative slope provide convincing evidence that sitting closer causes higher achievement, or is it plausible that the association is purely by chance because of random assignment?

In order to answer this question, we need to know more about "purely by chance because of random assignment". If we assume that seat location has No effect on Exam Score, then we could just randomly assign all 30 Exam Scores to each of the seat locations. We will do this by writing down each of the 30 Exam Scores onto an index card, shuffle the index cards, and then randomly assign them to seat locations.

In pairs, shuffle up the note cards and randomly assign 6 students into each of the 5 rows. Record the results:

Row 1: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Row 2: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Row 3: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Row 4: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Row 5: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ Now find the slope of the LSRL:  $b_1 =$  \_\_\_\_\_

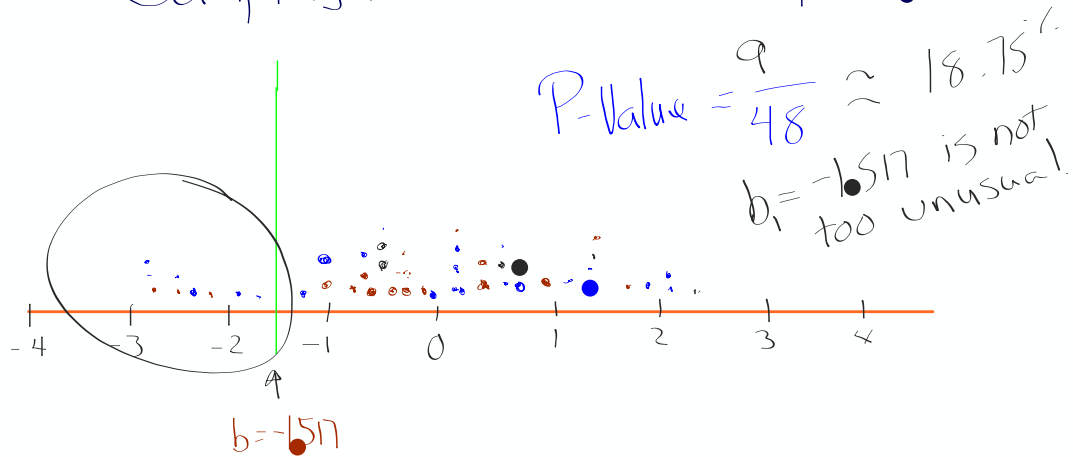
$$\hat{y} = b_0 + b_1x$$

slope

$b_1 =$

You have now calculated three different possible values for the slope based on random assignment. Take these 3 values to the dotplot on the whiteboard in the front of the room. When everyone in class has recorded their data, copy the dotplot below:

### Sampling Distribution of Slopes



Tomorrow we'll  
continue 12.1



AP Stats  
T-Shirts

Start individual  
chapter reviews  
for AP Exam

Strive for 5

Review Ch. 3

- Skim through all sections of Ch. 3 (big ideas / examples?)
- (A) Look at the Summary Sheet
- (B) Crossword puzzle
- (C) Multiple choice with answers
- (D) Frappy! + Score another student

} handout from book

• Finish for HW - I won't collect this HW, but there will be short LCQ's related to the reviews.

## Assignment