Welcome to AP Statistics

Please find the seat with your name

Introduce yourself to those in your group

Find at least one number to describe each person in your group, write the number next to your name

Content Objective: I will have a better idea of what the study of statistics is.
Social Objective: I will know the names and something interesting about my group members.
Language Objective: I will be able to discuss a study with my classmates using statistical ideas and vocabulary.

Here it comes…..

Your first statistics question:

Is 99 a good number for you?

If it is, stand up.

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Is 99 a good number for you if it's your……

- Bowling score?
- Golf score?
- Grade in AP Statistics?
- Monthly salary?
- Hourly salary?
  - In cents?
- Age?

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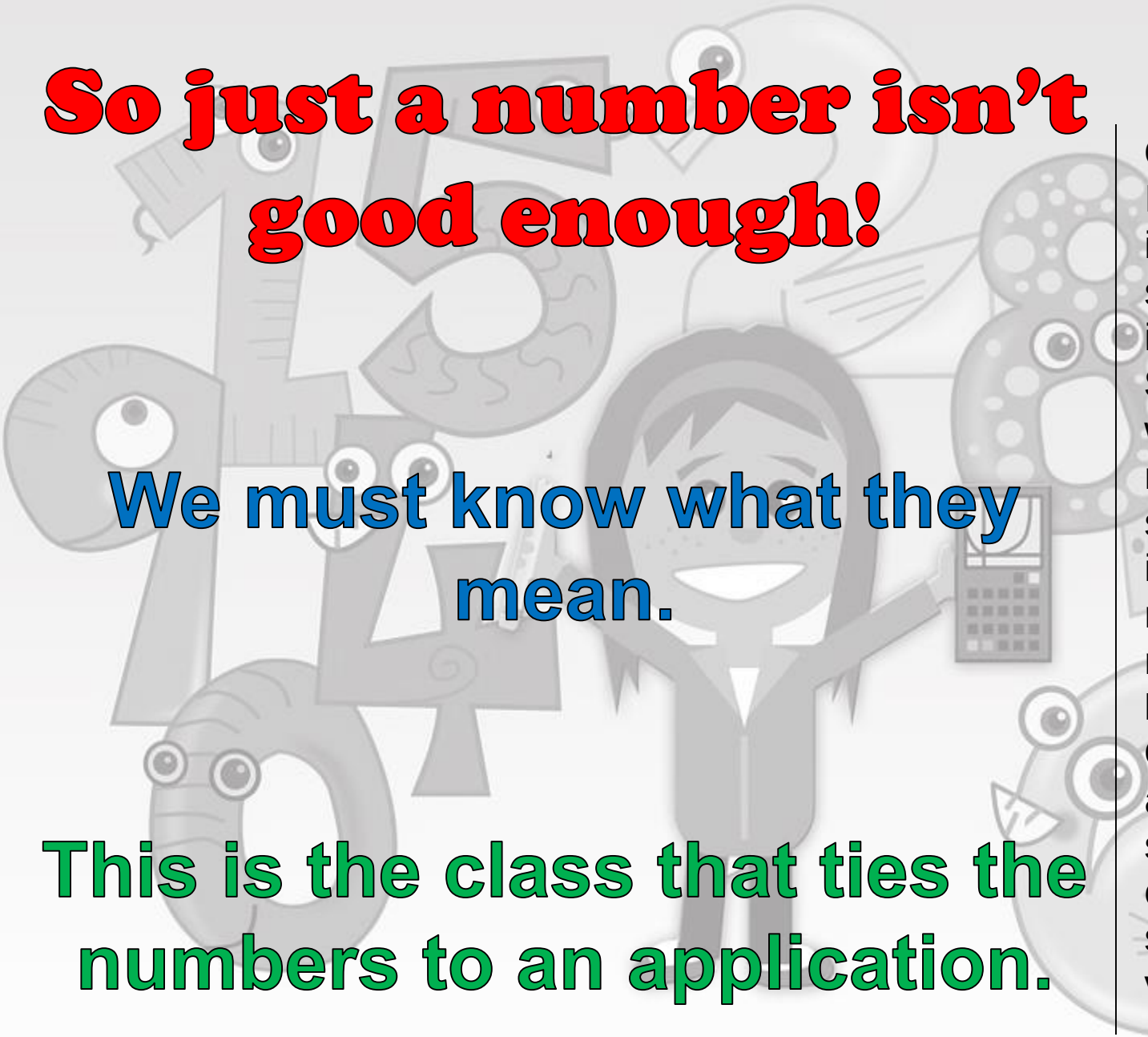
So just a number isn't good enough!



We must know what they mean.

This is the class that ties the numbers to an application.

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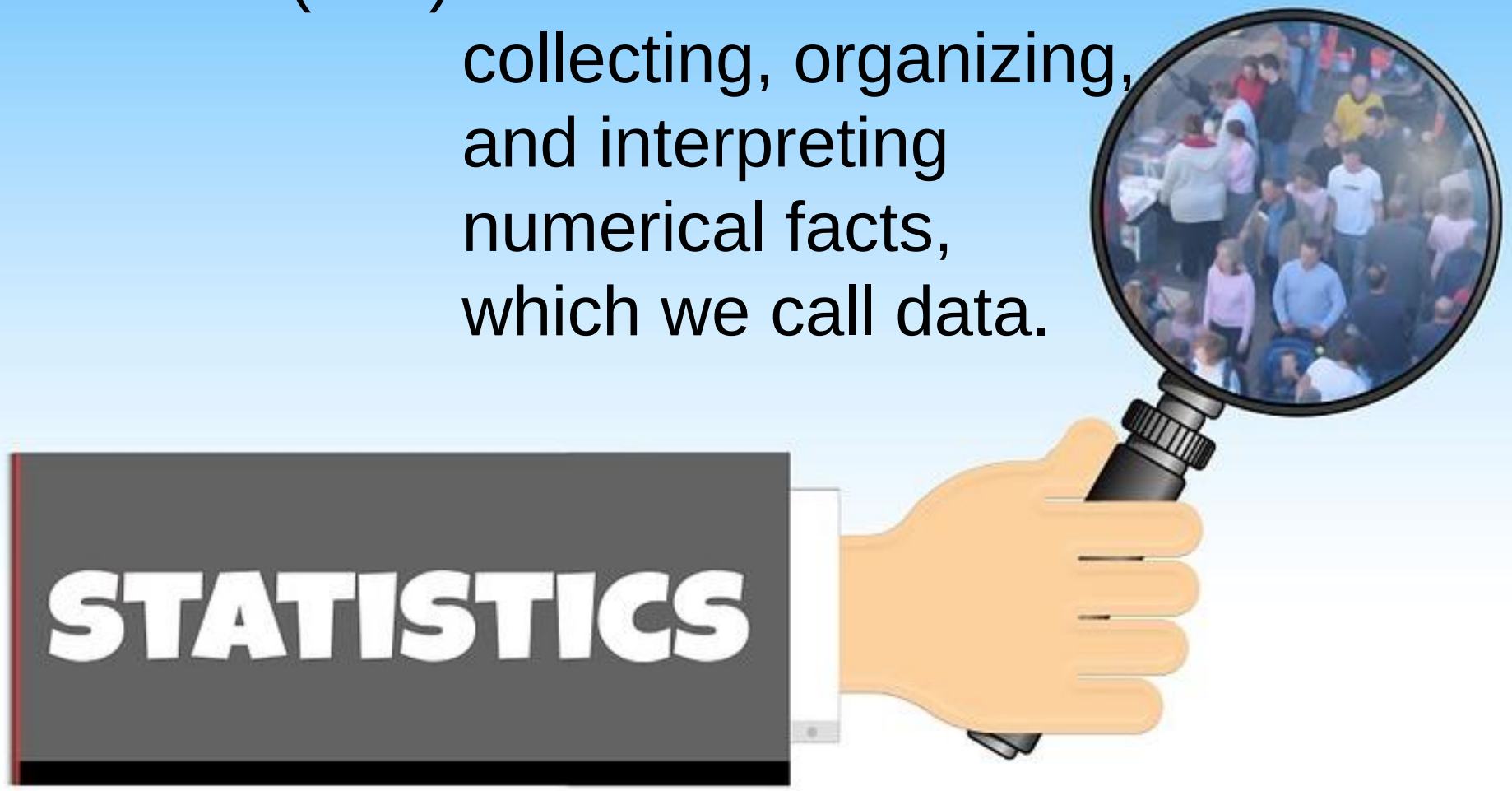
Statistics (def.) – The science of collecting, organizing, and interpreting numerical facts, which we call data.



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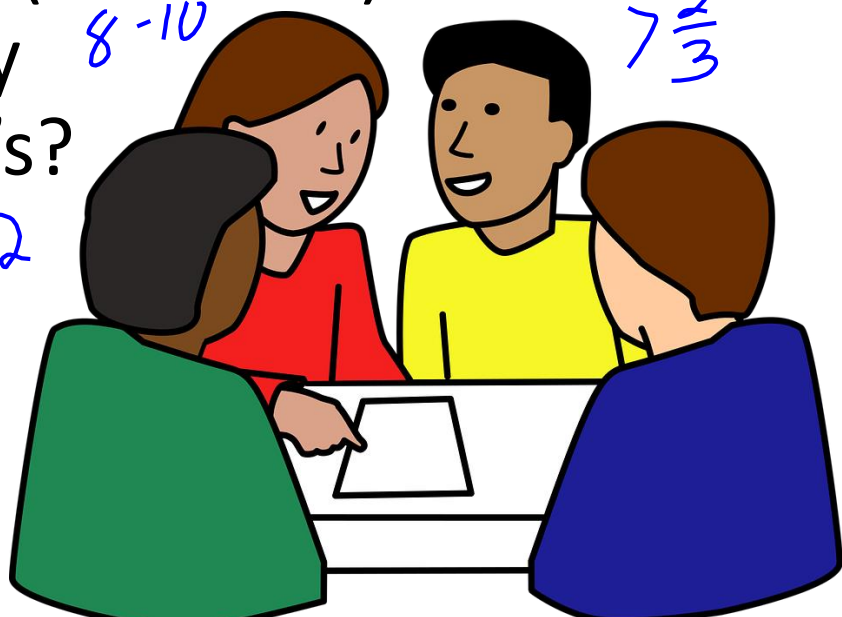
Our first study…

Discussion Questions

- Why would it be important to know that someone can smell Parkinson's disease?
- How many correct decisions (out of 12) would you expect Joy to make if she couldn't really smell Parkinson's and was just guessing?
- How many correct decisions (out of 12) would it take to *convince* you that Joy really could smell Parkinson's?



Simulating the experiment

People cannot smell Parkinson's disease.

- What claim were the researchers hoping to find evidence *against*? That is, what was their prior belief (called a **null hypothesis**) about the ability to smell Parkinson's?
- What claim were the researchers hoping to find evidence *for*? This is called the **alternative hypothesis**.

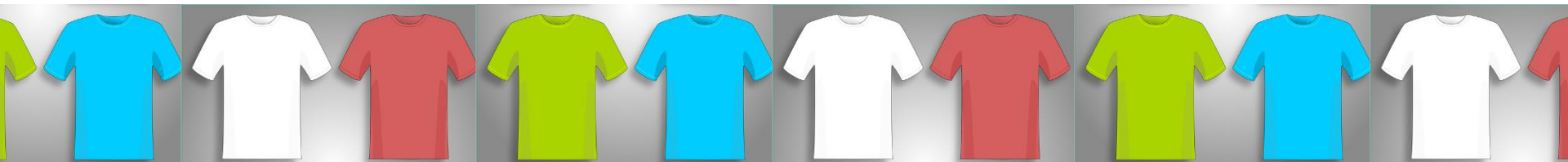
People can smell Parkinson's disease.

Performing the Experiment

- You will have 12 shirts shuffled into random order. Do not flip them over yet! On the back of some is "Parkinson's" and on the back of others is "No Parkinson's." Smell each shirt and guess Parkinson's or No Parkinson's. Your partner should tally the number of correct identifications using a table like below.

Tally of correct identifications	Number of correct identifications	Proportion of correct identifications

- Then switch roles – we want data from everyone.
- Once you have your data, record it on the dot plot on the board with the rest of the class.



More Discussion

$\frac{1}{33} \approx 0.0297$

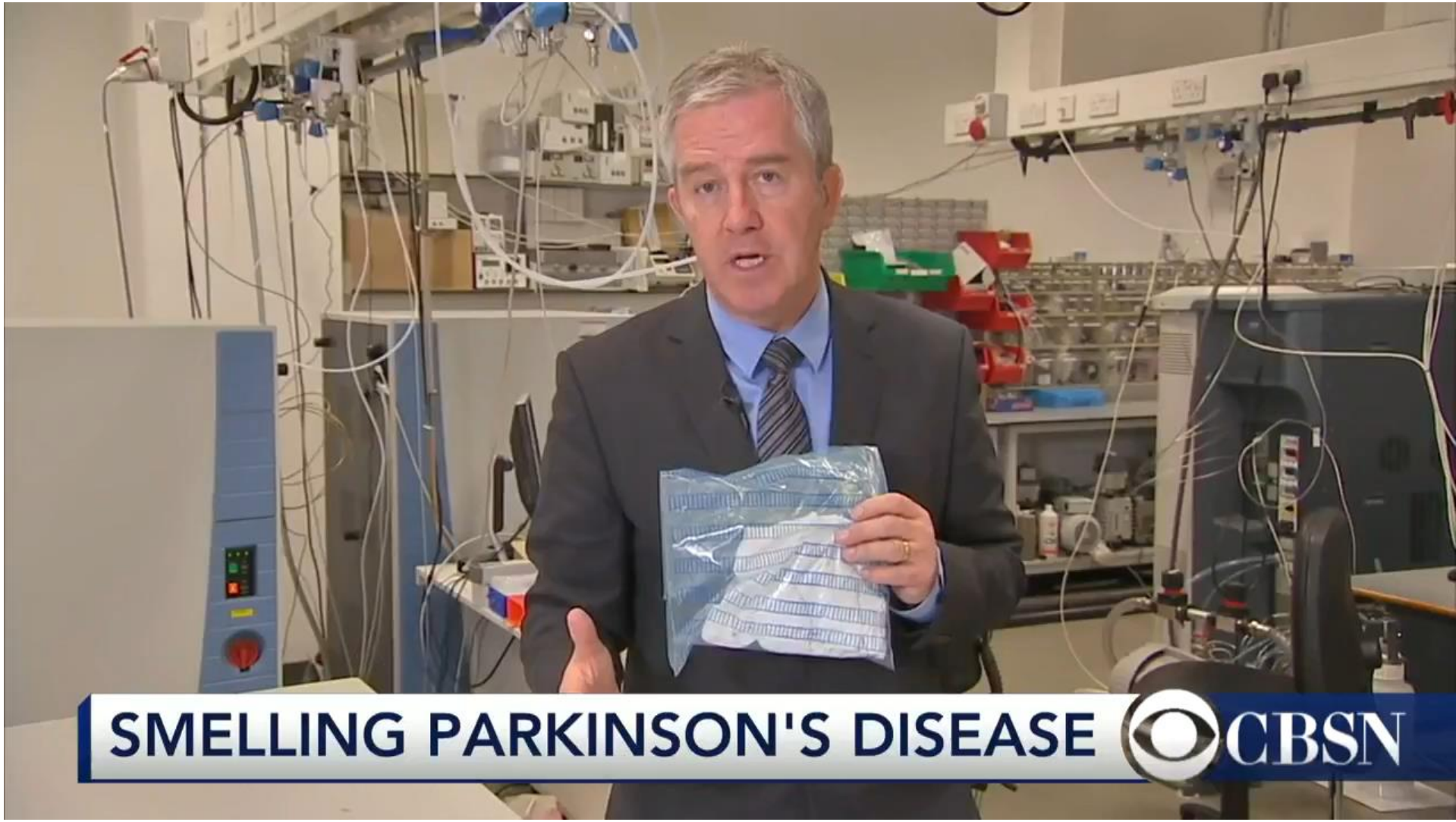
- In the actual experiment, Joy identified 11 of the 12 shirts correctly. Based on the very small-scale simulation by you and your classmates, what proportion of the simulations resulted in 11 or more shirts correctly identified, assuming that the person was guessing?

- The proportion you just calculated is a crude estimate of a true probability called a ***p*-value** (short for ***p*robability-value**). How might we improve our estimate of the true probability?

More Simulations

Rand Int (0, 12)

The Rest of the Story



One More Thought

- An interesting side note is that Joy's one "mistake" really wasn't a mistake. The shirt was worn by a person who supposedly didn't have Parkinson's even though Joy claimed that she could smell the telltale smell on that shirt. That person called the experimenters 8 months after the experiment and reported that he had just been diagnosed with Parkinson's disease. That meant that Joy correctly identified 12 out of 12 shirts. What is the approximate *p*-value for 12 shirts correctly identified, assuming that this person was just guessing?