

An Introduction to Statistics for middle/high school

**For
Special
Ed**





This unit was created with this guy in mind. He has autism and an intellectual disability. He is a non-reader and counts to 20, but with some support he is able to do this unit, and enjoys the challenge. He is my tester!!

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This unit contains over 100 pages of material. But, don't worry!! I have included an **8 day lesson plan** to help you make the most of everything packed in this unit.

Introduction to Statistics

Lesson Plan

Preparation

- Print out a vocabulary board for each student to use throughout unit
 - Laminate or place in page protector
- Book
 - Print out, laminate, and bind
 - OR your students can listen to the pre-recorded version
- Vocabulary cards
 - Print out a set of cards onto cardstock and laminate
 - Make one set for each student and also one for the teacher to use in I Spy games

Preassessment (do day 1 before starting lesson)

- Choose the form of the assessment that best fits the learning level of your student
- Give the assessment to assess what your students may already know
- I cannot emphasize enough how important this step is. If you want to see growth, this preassessment is so important!!

Teaching Tips

1. *Color Coding:* this is a really easy way to add more structure to a matching activity. Outline or color in an empty box or sorting label. Outline or color in the corresponding picture symbols the same colors. Becomes a color matching task.
 - a. For more info, read more here:
<https://specialneedsforspecialkids.org/2015/09/05/using-color-coding-for-differentiation/>
 - b. I also have a blog post on differentiating one activity 3 ways:
<https://specialneedsforspecialkids.org/2018/10/22/differentiating-1-activity-3-ways-easily-and-effectively/>
2. *Make your own copies of the activities:* Every day I review the activity we did yesterday. For that reason:
 - a. I often complete the activity myself and often laminated it for easy review that I could use year after year.
 - b. My copies were also helpful as either a model for students who needed more support or as a way for more advanced students to self-check their work.

The lesson plans contain:

Overall tips for teaching
students with significant
needs

$R = R_1 + R_2$ $\text{arccos}(x)$ $h_1 \rho_1 = h_2 \rho_2$ $\sum \vec{M} = 0; \vec{M} = \vec{F} \cdot L$ $Q = \lambda m$
 $\frac{E_1}{E_2} = 10^{0.4(m_2 - m_1)} = \left(\frac{r_2}{r_1}\right)^2$

Day	Activity	Day	Activity
1	<ul style="list-style-type: none"> • Book • Vocabulary activity • Circle map 	5	<ul style="list-style-type: none"> • Book • Vocabulary activity • Identify mean, mode, and median
2	<ul style="list-style-type: none"> • Book • Vocabulary activity • Sorting activity 	6	<ul style="list-style-type: none"> • Book • Vocabulary cut and past • Sudoku puzzle
3	<ul style="list-style-type: none"> • Book • Vocabulary activity • Identify mean, mode, and median 	7	<ul style="list-style-type: none"> • Book • Vocabulary cut and past • Close worksheets
4	<ul style="list-style-type: none"> • Book • Vocabulary activity • Identify mean, mode, and median 	8	<ul style="list-style-type: none"> • Review if needed • Assessment

The lesson plans contain:

A quick look at what you will do each day

$F = qvB \sin \alpha$ $a = \frac{d\vec{v}}{dt}$ $\oint \vec{B} \cdot d\vec{l} = \mu_0 I_s$ $e=0 \quad e<1 \quad e=1$

Day 5

Activity	Notes	Materials
Read or listen to a recording of the book (10 minutes)	<ul style="list-style-type: none"> • Read through the story, asking lots of questions • Continue to make connections between book and vocabulary board 	<ul style="list-style-type: none"> • Book • Vocabulary board
Vocabulary cards Bean Bag Toss (10 minutes)	<ul style="list-style-type: none"> • Glue the cut apart symbols to the paper plates (one on each plate) • Arrange them around the room • Students toss the bean bag trying to get it to land on a paper plate <ul style="list-style-type: none"> ◦ Students retrieve the paper plate and share the vocabulary card they retrieved 	<ul style="list-style-type: none"> • Vocabulary cards • Vocabulary cards cut apart • Small paper plates or plates of construction paper • Bean bag
Mean, mode, and median review (5 minutes)	<ul style="list-style-type: none"> • Review the worksheet completed yesterday 	<ul style="list-style-type: none"> • worksheet from yesterday
Identify mean, mode, and median (10 minutes)	<ul style="list-style-type: none"> • Students will identify mean, mode and median from a data set and a survey. • Do worksheet using a data set and one worksheet using a survey. • Each worksheet has a color-coded differentiated version 	<ul style="list-style-type: none"> • Worksheet
Sharing (10 minutes)	<ul style="list-style-type: none"> • Each student shares their finished worksheets with the group using the communication method of their choice 	<ul style="list-style-type: none"> • Completed worksheet • Communication devices

The lesson plans contain:

Detailed instructions on how that day's lesson should run

Inferential statistics can be helpful when predicting who might win an election or even how an experiment might turn out.



Another helpful measure to know is the **mode**. The mode is the number that is the most common. In this case it is 50 degrees.

Day	Temperature
1	50
2	50
3	51
4	52
5	55
6	52
7	50
8	50
9	51


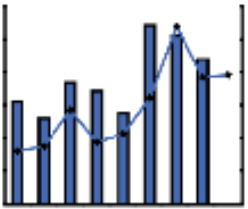
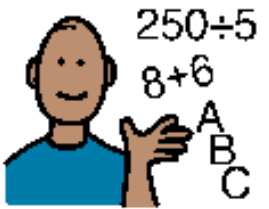

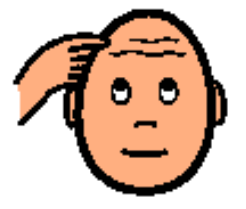

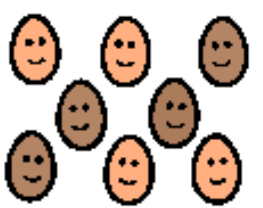


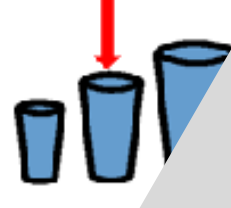
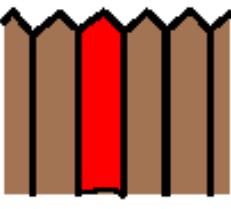
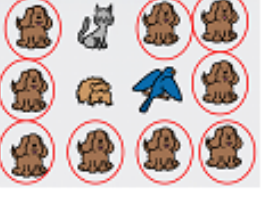
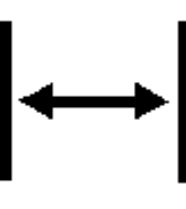
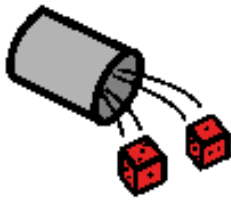



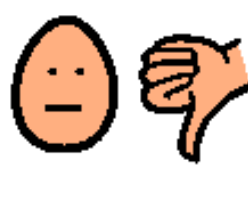


This unit contains a book that is 33 pages to introduce the topic.

It comes in a pdf version as well as a voice recorded powerpoint (so you don't have to print it out.)

This unit comes with a vocabulary board.

Vocabulary boards are great for ALL students to assist with participation and engagement in group discussions.

Tips on how to use in the unit!!

 statistics	 data	 statistician	 descriptive	 inferential
 predict	 population	 sample	 data set	 measure
 median	 mode	 range	 experiment	 survey
 repeat that	 yes	 no	 I don't know	 I need a break

Also in black and white

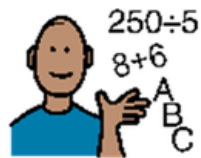
statistics

Collecting and analyzing data looking for common characteristics.



statistician

Person who collects, studies, and uses data to make decisions.



descriptive statistics

Use data without making any predictions; daily temperature is an example.



inferential statistics

Use data to make a prediction; who will win an election is an example.



population

Group of people or things you want to collect data from.



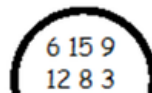
sample

Smaller part of the whole population that is representative of the entire population.



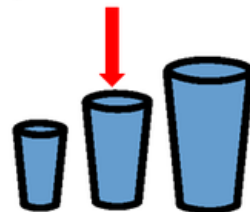
data set

Actual data collected and used.



mean

Average. Sum of all the numbers divided by the total number of values.



This unit comes with 12 vocabulary cards.

Every day students will do a group activity using these cards to get more familiar with words that are likely new to them.

Also in black and white

statistics

Collecting and analyzing data looking for common characteristics.

statistician

Person who collects, studies, and uses data to make decisions.

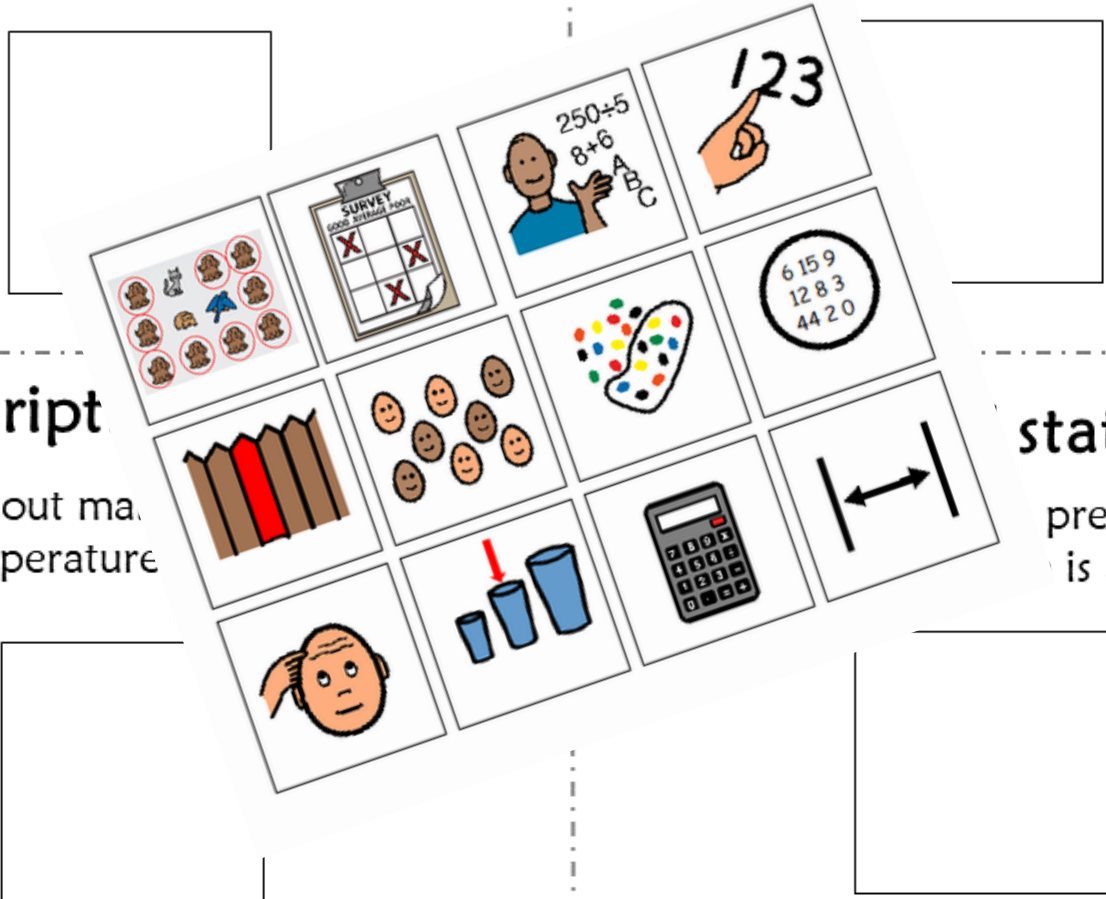
Students will also test their knowledge of these new words and symbols with a cut and paste activity on days 6&7.

descript

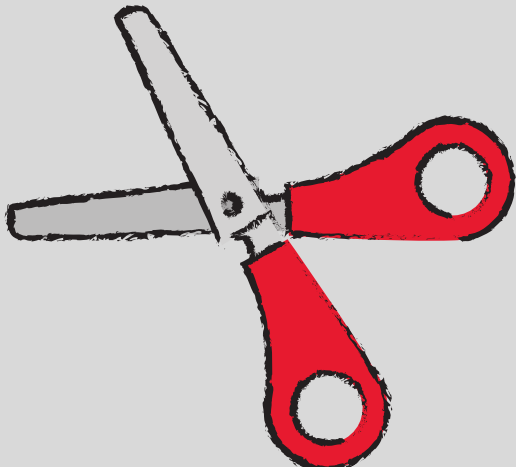
Use data without ma.
daily temperature

statistic

prediction; w
is an example



Also in black and white



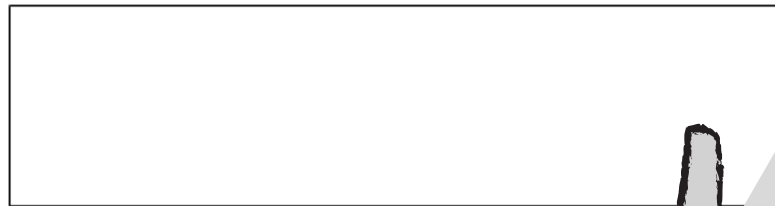
$$R = R_1 + R_2$$



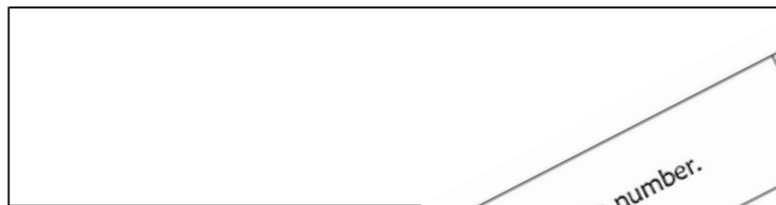
population



sample

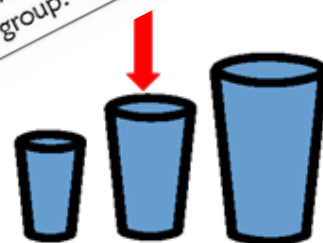


data set



12
44

The middle number.	Use data without making any predictions; daily temperature is an example.
Group of people or things you want to collect data from.	Difference between the largest and smallest data point.
Collecting and analyzing data looking for common characteristics.	Smaller part of the whole population that is representative of the entire group.



Also in black and white

You have **2 choices**:

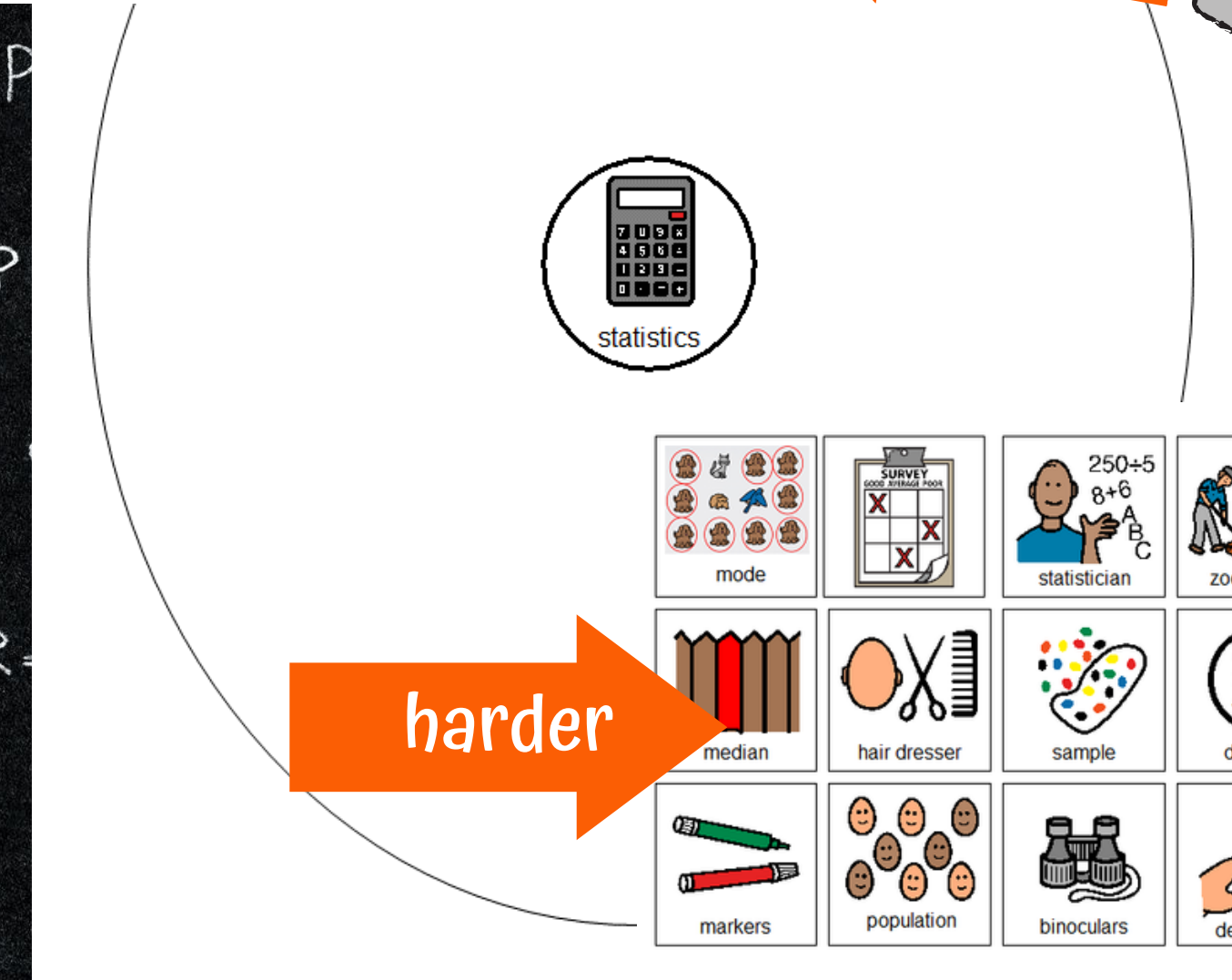
1. Students match the picture to the definition (easier).
2. Students match the definition to the picture (harder).


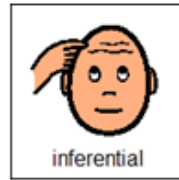
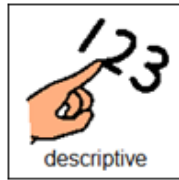
Circle map

This circle map is a great way for students to see a the concept at a glance.


There are 2 versions:

- One is errorless
- One has wrong answers mixed in students will have to set aside






average # hits for each player on the team




average number of people on subway at 5:00pm




who will likely win the election




most common pet bought at pet store




favorite ice cream flavor in the class




how many hurricanes are likely to occur



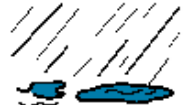
average temperature in June




does the number of hours you study affect your grade



which popsicle flavor will likely run out first



most amount of rainfall in one day



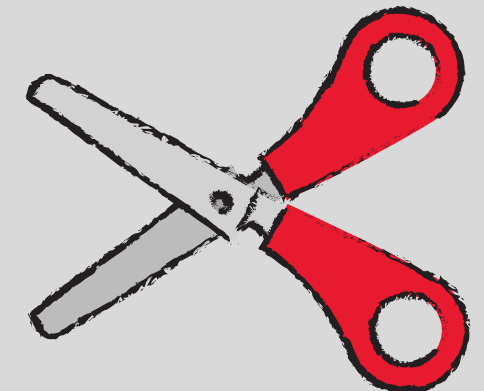
who will likely win the race



how long before your car likely breaks down

In this activity, students sort examples of descriptive and inferential statistics.

Directions on how to differentiate with color is included.



Answer the questions below about each data set.

2, 2, 2, 6, 8, 12, 15, 25, 27

Average= 11

Mean=

Mode=

Median=

4, 9, 10, 11, 13, 13, 24

Average= 12

Mean=

Mode=

Median=

3 using data sets

Answer the questions below about each data set.

1, 1, 3, 3, 4, 5, 5, 5, 9

Average= 4

Mean=

Mode=

Median=

1, 2, 3, 5, 5

Average= 3.2

Mean=

Mode=

Median=

There are some worksheets that **INTRODUCE** the idea of mean, mode and median. I have a more advanced unit that looks at calculating these.

Each is differentiated

Answer the questions below about each survey.

Person	# hotdogs eaten
Sally	1
Bill	2
Joey	3
Brian	7
Gary	7

Average= 4

Mean=

Mode=

Median=

3 using survey data

Answer the questions below about each survey.

Person	# laps run
Hal	2
Robbie	4
Barb	6
Glen	8
Bob	14
Beth	14
Dave	15

Average= 9

Mean=

Mode=









Median=









Each is differentiated

This will assess students understanding of what each term means without having to manipulate numbers or do any calculations.


















Statistics

easy

 inferential		 survey	
 statistics	 survey		
	 statistics	 descriptive	 inferential
		 statistics	

 statistics	 descriptive	 descriptive	 descriptive
 inferential	 inferential	 survey	 survey

Statistics

 median	 inferential		 population	 descriptive
 population	 statistics		 median	 mean
 descriptive	 inferential	 mean	 population	
	 statistics	 descriptive		
	 mean	 median		
			 median	

hard

There is a Sudoku puzzle in this unit as well. This is a great way to work with the new vocabulary!!

There are 2 versions plus answer keys.



Statistics

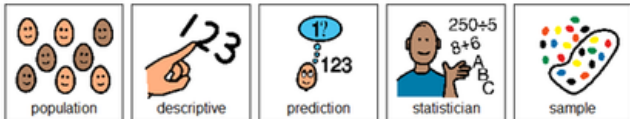
1. A person who gathers information and studies trends is a

2. statistics gathers and presents existing data.

3. Inferential statistics takes that data and uses it to make .

4. The is who or what you are gathering data from.

5. Most often, statisticians just look at a rather than the entire population.



Statistics

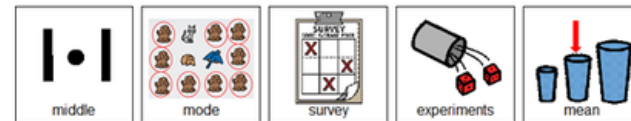
The is the average of a set of numbers or results.

The median is the number of the data set.

The is the most common number in the data set.

Data can come from a or asking a group of people questions.

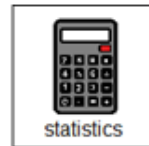
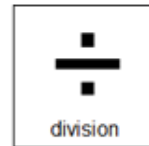
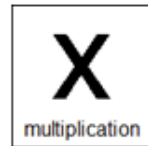
10. Statisticians can also do their own to collect data.



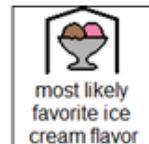
Close worksheets are a great informal assessment. This unit has 2 of them, for a total of 10 fill-in-the-blank questions.

Answer key included.

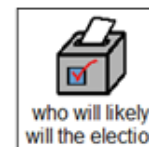
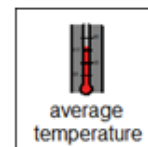
1. This is the collection, summarization, and use of data:



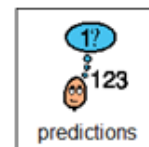
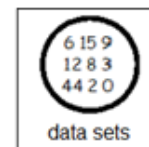
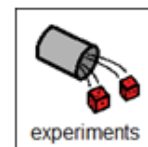
2. Which if the following is an example of descriptive statistics?



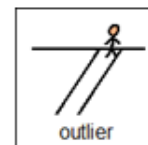
3. Which if the following is an example of inferential statistics?



4. Inferential statistics is used to make:



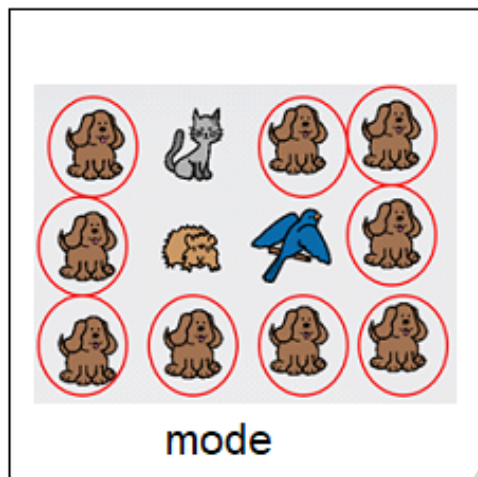
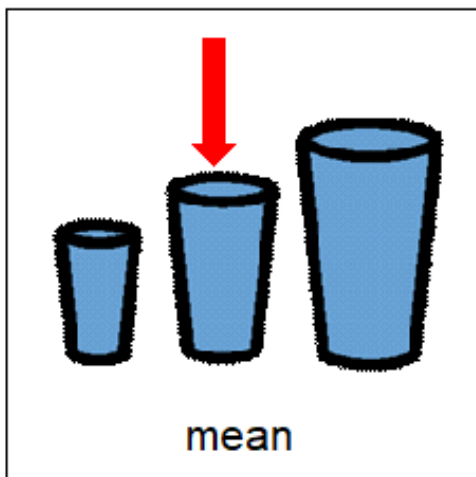
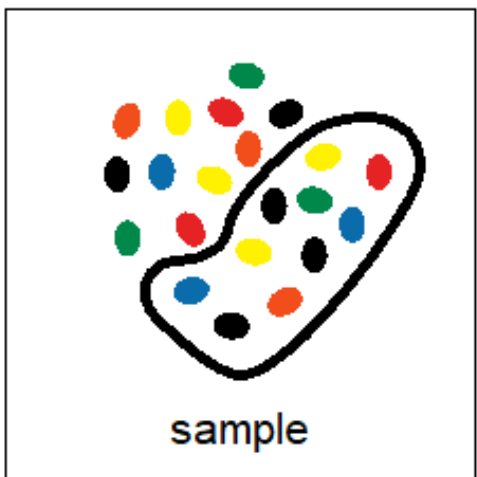
5. The part of the population that the data actually comes from is called the:



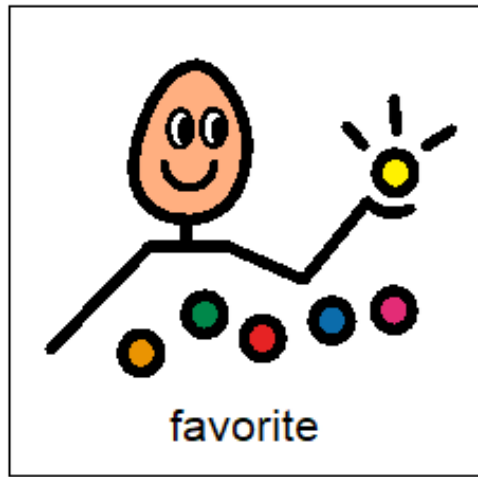
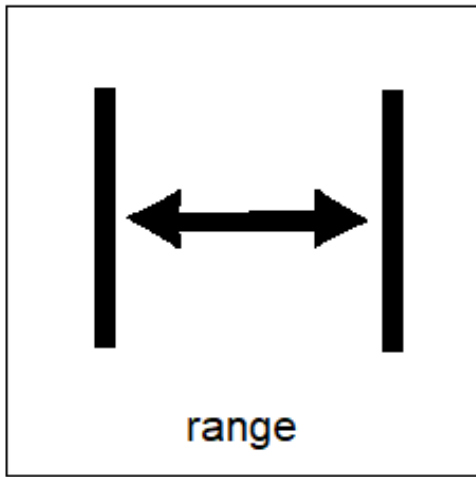
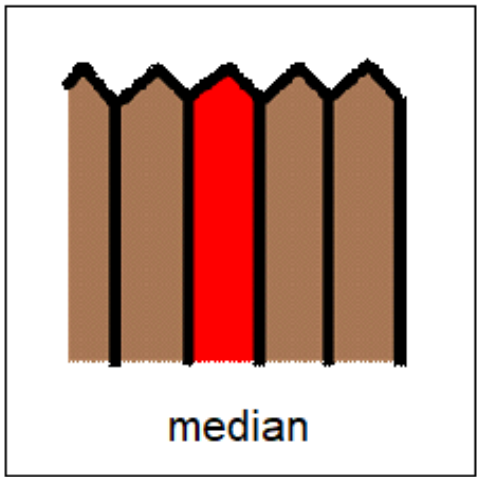
FINALLY the assessment!! There are 3 versions. This version has 10 questions with 3 picture choices for each question.

Answer key included.

Q 7



Q 8



With this version, you cut out the answer choices and glue them on index cards. Ask the student the question, and they point to the correct answer.

1. This is the collection, summarization, and use of data:
 - A. Multiplication
 - B. Division
 - C. statistics
2. Which if the following is an example of descriptive statistics?
 - A. Batting average
 - B. What weather will be like tomorrow
 - C. Most likely flavor of ice cream
3. Which if the following is an example of inferential statistics?
 - A. Average temperature
 - B. Who will likely will the election
 - C. Average number of pets
4. Inferential statistics is used to make:
 - A. Experiments
 - B. Data sets
 - C. predictions
5. The part of the population that the data actually comes from is called the:
 - A. Outlier
 - B. Sample
 - C. Friendly
6. All the information collected is called the:
 - A. Data set
 - B. Mean
 - C. population

This is your traditional multiple choice version. It can also be used as a recording sheet if your students are using the version with index cards.



I realize there will be some students out there unable to do cutting activities. I have a blog post with ways to complete activities without a pair of scissors!!

[Click Here to read more!!](#)

All of the activities (except the book) comes in color and black and white.