**#5 Venn Diagrams & Two-Way Frequency Tables**

* A \_\_\_\_\_\_\_\_ is a collection of things
* For example, the items you wear are in a set: these would include shoes, socks, hat, shirt, pants, and so on.
* You write sets inside **\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** like this:

* You can also have sets of numbers
	+ The set of numbers between 1 and 5 would be:

**TWO-WAY TABLES** – CONDITIONAL PROBABILITY REVIEW

* Two way tables \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ one thing with another. For example, the number of students taking Spanish lessons, and which of those students are girls or boys.
* These tables can be used to work out the probability that a student selected at random would be a boy taking Spanish, for example.

Example – Data Collection: What is the Probability of someone in the room not currently owning an iPod, but who has been to Atlanta, GA?

**VENN DIAGRAMS**

* Venn diagrams were invented by a guy named John Venn (no kidding; that was really his name) as a way of picturing relationships between different groups of things.
* We can use Venn Diagrams to hold the same information presented in Two-Way Tables.

Example 1: Students who have been to Atlanta and students who own an iPod



**UNIONS VS. INTERSECTIONS**

* The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of a set is everything that is included. The symbolic representation is \_\_\_\_\_.
	+ So the union of students who have been to Atlanta or own an iPod is :
* The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of a set is everything they have in common. The symbolic representation is \_\_\_\_\_.
	+ The intersection of students who have been to Atlanta and students who have an iPod is:

**UNIONS**

Example 2: A bouquet of flowers contain roses, carnations, and baby’s breath. A second bouquet has roses, lilies, and daisies. Both bouquets are put in the same vase. Write a set for union of flowers in the vase.

Example 3: P = {5, 10, 15, 20} and Q = {8, 10, 18, 20}. Find P ∪ Q.

Example 4: What would the intersection of the following Venn diagram be?.

Example 5: What would the intersection of the following sets be?

* + - A { 1,3,5,7,9,11,13} and B {1,2,3,4,5,6,7}

Example 6: In a school of 320 students, 85 students are in the band, 200 students are on sports teams, and 60 students participate in both activities.  How many students are involved in either band or sports?

State Final Example! Twenty-one students at a school have an allergy to peanuts, shellfish, or both.
 □Fourteen students at the school are allergic to peanuts.
 □Twelve students at the school are allergic to shellfish.
How many of the students are allergic to both peanuts and shellfish?