

**complement:** all the elements of a universal set that do not belong to a subset of it  
(Complement is denoted  $O'$ .)

Example:  $O' = \{0, 2, 4, 6, 8\}$  is the complement of  $O = \{1, 3, 5, 7, 9\}$ , a subset of the universal set of digits,  $D = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$ .

**disjoint:** two or more sets having no elements in common

Example: The set of even numbers and the set of odd numbers are disjoint.

**element (member):** an object in a set

Example: 5 is an element of  $W$ , the set of whole numbers.

**empty set:** a set with no elements (Empty set is denoted by  $\{ \}$  or  $\emptyset$ .)

Example: The set of odd numbers divisible by 2 is an empty set.

**equal:** two or more sets that have the same elements, even if they are not listed in the same order

Example:  $A = \{1, 2, 3, 4\}$  and  $B = \{4, 3, 2, 1\}$  are equal sets.

**equivalent:** two or more sets that have the same number of elements

Example:  $M = \{1, 2, 3\}$  and  $N = \{\text{red, yellow, blue}\}$  are equivalent sets.

**finite set:** a set with a countable number of elements

Example: The set of positive prime numbers less than 10,  $P = \{2, 3, 5, 7\}$ , is finite.

**graphic organizer:** visual representation of knowledge, concepts, thoughts, or ideas

Example: Venn diagram, tree diagram, T-chart, and outcome table are types of graphic organizers.

**infinite set:** a set with an infinite number of elements

Example: The set of whole numbers,  $W = \{0, 1, 2, 3, \dots\}$ , is infinite.

**intersecting:** two or more sets that have elements in common

Example:  $T = \{\text{red, blue, yellow, orange}\}$  and  $W = \{\text{yellow, orange, purple, green}\}$  are intersecting because they have the elements *yellow* and *orange* in common.

**intersection:** the set of elements that are common to two or more intersecting sets ( $A \cap B$  denotes the intersection of sets  $A$  and  $B$ .)

Example: If  $A = \{2, 3, 4, 5\}$  and  $B = \{4, 5, 6, 7\}$ , then  $A \cap B = \{4, 5\}$ .

**mutually exclusive:** two or more events that cannot occur at the same time

Example: Being awake and being asleep are mutually exclusive events.

**Principle of Inclusion and Exclusion:** the number of elements in the union of two sets is equal to the sum of the number of elements in each set less the number of elements in both sets;  
 $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

Example: If  $A = \{1, 2, 3, 4, 5\}$  and  $B = \{4, 5, 6\}$  then  $n(A \cup B) = 5 + 3 - 2 = 6$ .

**relative complement of  $A$  and  $B$ :** the set containing all the members of  $B$  that are not members of  $A$  (Relative complement is denoted  $B \setminus A$  or  $B - A$ .)

Example:  $\{4, 5, 6\} \setminus \{1, 5\} = \{4, 6\}$  whereas,  $\{1, 5\} \setminus \{4, 5, 6\} = \{1\}$ .

**roster method:** a mathematical notation for describing a set by listing all its elements

Example:  $A = \{4, 5, 6, 7\}$  shows the members of the set  $A$  using the roster method.

**set:** a collection of distinguishable objects

Example: The set of whole numbers is  $W = \{0, 1, 2, 3, \dots\}$ .

**set notation:** a mathematical notation for describing a set by stating the properties that its members must satisfy

Example:  $A = \{x | x \leq 10, x \in I\}$  shows the members of the set  $A$  using set notation.

**singleton:** a set with exactly one element

Example: The sets  $\{red\}$  and  $\{9\}$  are examples of singletons.

**subset:** a set whose elements all belong to another set (Subset is written as  $O \subset D$ .)

Example: The set of odd digits,  $O = \{1, 3, 5, 7, 9\}$ , is a subset of  $D$ , the set of digits.

**union:** the set of all the elements in two or more sets ( $A \cup B$  denotes the union of sets  $A$  and  $B$ .)

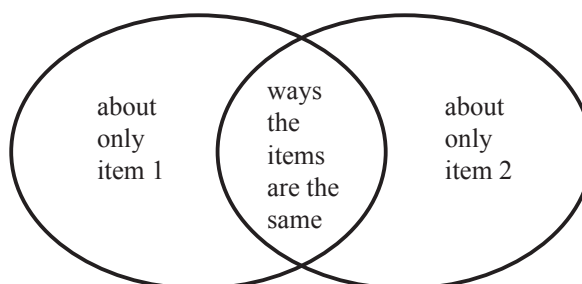
Example: If  $A = \{4, 5, 6\}$  and  $B = \{2, 4, 6, 8, 10\}$ , then  $A \cup B = \{2, 4, 5, 6, 8, 10\}$ .

**universal set:** a set of all elements under consideration for a particular context (also called the sample space)

Example: The universal set of even digits is  $E = \{0, 2, 4, 6, 8\}$ .

**Venn diagram:** an organizational tool made for charting similarities and differences between objects, numbers, or other elements

Example:



**written description:** describing in words a certain property that all elements in a set have in common

Example: The description *red fruit* identifies the set of all fruit that is red.