Math 4. Classwork #5.

Sets.

- I put a skirt, a book, a toothbrush, a coffee mug, and an apple into a bag. Can we call this collection of items a set? Do all these objects have something in common?
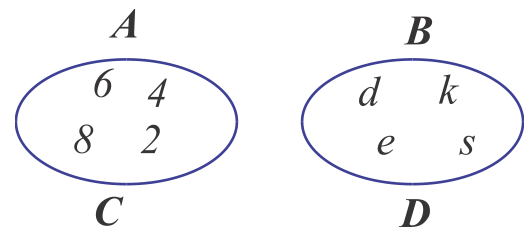
> **A set** is a collection of objects that have something in common.

We can describe the members of a set by listing each member of the set:
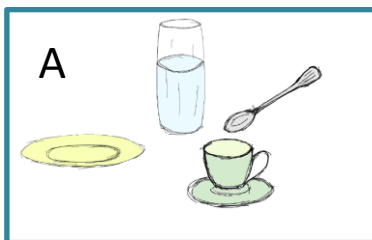
$A = \{2, 4, 6, 8\}$

$B = \{d, e, s, k\}$.

.

A
B

C 6   4 D d   k

8   2   e   s

Venn diagram.

1. $A = \{a, b, c\}, B = \{1, 2, 3, 4\}$.
   Write the intersection $(A \cap B)$ and the union $(A \cup B)$ of these two sets.

2. Which word we can use to describe a set, subset of which is drawn on the pictures below. List a few other objects that can be added to these sets.

A

B

3. In 2 boxes there are 160 notebooks altogether. In one box there are 20 more notebooks than in the other. How many notebooks are there in each box?

4. There are 20 students in a Math class. 10 students like apples and 15 students like pears.

   Show that there are some students who like both apples and pears.

   - Assume that each student likes at least one of the fruits. (This means that each student like either apples, or pears, or both). How many students like both pears and apples?

   - Is it possible to determine if there are any students who do not like apples and do not like pears?

   - Which part of the diagram shows:" Those who like apples, but not pears"?

5. The same Math class (with 20 students) forms a soccer team and a basketball team. Every student signs up for at least one team:

   - 12 students play only soccer;

   - 2 students play both soccer and basketball;

   How many students play basketball only?

6. Students who participated in math competition had to solve 2 problems, one in algebra and another one in geometry. Among 100 students 65 solved an algebra problem, 45 solved a geometry problem, 20 students solved both problems. How many students didn't solve any problem at all?
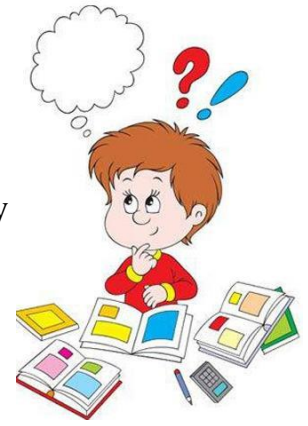
7. 240 students from New-York and Seattle attended a math camp. Of the total number of students, 125 were boys. 65 boys were from New-York. There were 53 girls from Seattle. How many students came from New-York?

Symbols to Remember

$\in$	element belongs to a set
$\notin$	element does not belong to a set
$\subset$	one set is a subset of another set
$\not\subset$	one set is not a subset of another set
$\cap$	intersection of two sets (elements that are in both sets)
$\cup$	union of two sets (elements that are in either set)
$\varnothing$	empty set