Movement game

The students play a game in which they guess the "patterns of thinking" of others.

Logic (gr. λόγος, logos – reason, word, thought) – according to the classical definition, logic is a science concerned with the clear and precise formulation of thought, as well as with the rules of correct reasoning and the rules for validating statements and propositions.

Logical thinking, otherwise known as reasoning, is the ability to combine and link together information. It is thanks to this skill that we can understand the meaning of a statement and make logical conclusions (i.e. deductive conclusions). In other words, based on the premises presented to us we are able to make correct deductions.

Talk

The students consider what is meant by a attribute of an object.

An attribute is that which enables us to identify a given object. An attribute allows us to distinguish certain objects from one another and perceive others as similar to one another.

Experiment

Students form sets out of geometric shapes with specific attributes.

What is a set?

A set is a primary, i.e. an intuitive concept. It lies at the basis of mathematics and means an unordered collection of different objects which possess one specific and common attribute. A set can be understood as a kind of box or a drawer in our head that enables us to arrange and put in order all the things around us.

We are able to divide all objects into sets because all have certain attributes.
We can form an infinite number of sets, because we can create an infinite number of attributes, sets of attributes, etc. Within any one set we can create as many subsets as there are possible combinations of elements, such that no element appears more than once in a given subset.

Observing

The students learn about collections of sets, i.e. classes and classification.

Classification is a process, i.e. an action we can perform. It is a systematic division of objects and phenomena into classes, according to specific rules and principles. A perfect example is the classification of animals. For example, a lion belongs to the animal kingdom, the class of mammals, the cat family and the species of lions. This is precisely a classification of animals made according to certain attributes that correspond to different sets. It is thus an act of organizing things according to certain attributes.

A class is a collection of sets. Thus when we place two smaller cardboard boxes, e.g. with triangles and squares, inside a larger cardboard box, we can say that we have created a collection of sets, i.e. a class of geometric shapes.

Summary
The students look for examples of single element (singleton) sets and empty sets.

Can there be such a thing as a class with only one element?
Yes. It is possible to choose attributes that apply only one element. This gives us a singleton (single-element set) set. One possible example would be a set of adults taking part in a lesson. Probably only one of them will be the teacher, who would then be the only element of this set.

Can there be such a thing as an empty set?
Yes. For example, it is possible to form a set of all people in a class who are no more than 30 cm (1ft) in height. There are no such people, but the set itself (the box) still exists. There can be an infinite number of empty sets.

How many sets is it possible to create?
An infinite number of sets can be created.