

## 2.3 Methods

For the cell or object, which has behavior to be able to communicate with other cells, it will make use of cell receptors or functions/methods as they are known in OO programming languages. The method carries out an action, which is able to make changes to the cell organelles (instance fields) or object contents therefore there exists a relationship between a cell and a receptor meaning modifying the contents of the cell is done through the receptor and can be expressed as **cell.receptor** or in OO programming as **object.method**.

When OO languages were created the attempt was to mimic nature processes or OOB and needed to be converted into a scientific form like OOC for being able to simulate different objects from the real world.

OOC is responsible for explaining how any OOL logic functions. Every OOL has a foundation that makes up the language, which consists out of objects (cells), functions (receptors), and classes (blueprint). As stated, before an object is a block of memory that allows us to simulate real world objects using any OO programming language. Furthermore, an object has behavior and belongs to a class. A class is a collection of objects and its naming convention should be represented as a noun. The method carries out an action, its naming convention should be represented in a form of a verb and it also belongs to a class. Methods exist in two flavors, such as mutators and accessors. A general diagram is shown below in Fig. 1.

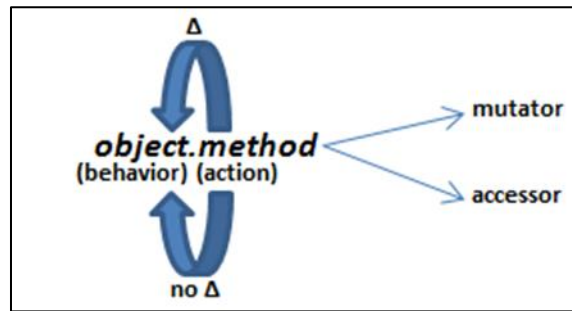


Fig. 1

OOC is a descriptive discipline meaning no problems are solved mathematically instead they are described scientifically using Sigma  $\zeta$ -calculus or calculus of objects. The OOP concepts and logic descends from OOB and is transformed into OOC, which is a procedural language. In OOC the formula **object.method** is represented as **o.l** where **o** is the object and **l** is the method. The explanation of the formula **o.l** will demonstrate where all the OO languages philosophies on objects and methods associations come from. The true meaning of this formula can be stated as an invocation of method **l** of object **o** meaning that when **l** is applied on the **o** a modification of the **o** contents occurs. By looking at this process in more details the real meaning of **o.l** can be explained with the following expression **o.l  $\Leftarrow \zeta(x)b$** . Functions or methods are recognized if they have the basic calculus structure **f(x)** where **f** is the name of the function and **x** is the input or parameter. The same analogy can be applied to the expression  **$\zeta(x)b$** . The Greek letter Sigma  $\zeta$  represents a function name with an input **x** and **b** represents the body of the function. Putting it together the expression  **$\zeta(x)b$**  can be read as method  $\zeta$  with a parameter **x** and body **b**. The leftwards double arrow  $\Leftarrow$  means update. The full expression **o.l  $\Leftarrow \zeta(x)b$**  can be read as update of method **l** of object **o** with method  **$\zeta(x)b$**  meaning the update produces a copy of **o** and the method **l** is replaced with  **$\zeta(x)b$** .

It is possible to transform the OOC expression **o.l  $\Leftarrow \zeta(x)b$**  into an OOP language. In order to show the true purpose of the OOC expression, it will be necessary to provide a detailed explanation of objects and methods and their relationship to each other and to OOC.

Furthermore, it is possible to explain via OOC the creation of data types, decisions, and iteration in OO programming languages.

## 2.4 Self-Check Questions for the Methods Sub-Section

1. What does the method carry out?
2. Name the three most important foundation that any OOP language has?
3. What is a class?
4. What are the two methods that exist in OO languages?
5. What is the naming convention that should be used for a method?
6. What is the method convention that should be used for a class?
7. What kind of a discipline is OOC?
8. What does the leftwards double arrow mean?
9. By what means do objects get updated?
10. What kind of science discipline is OOC based on?