JAVA

Class 16

Agenda

Object and Class in Java
Method in Java
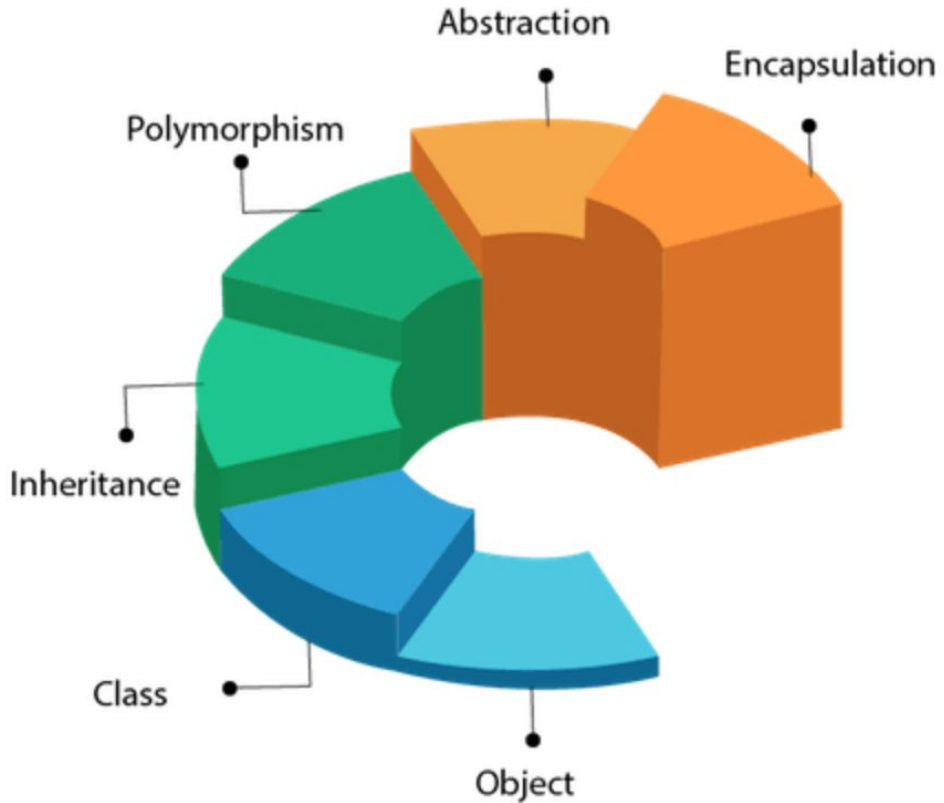
OOPS Concept in JAVA

Java is an Object-Oriented Language

The popular object-oriented languages are Java, C#, PHP, Python, C++, etc.

Object-Oriented Programming is a methodology or paradigm to design a program using classes and objects. It simplifies the software development and maintenance

Class

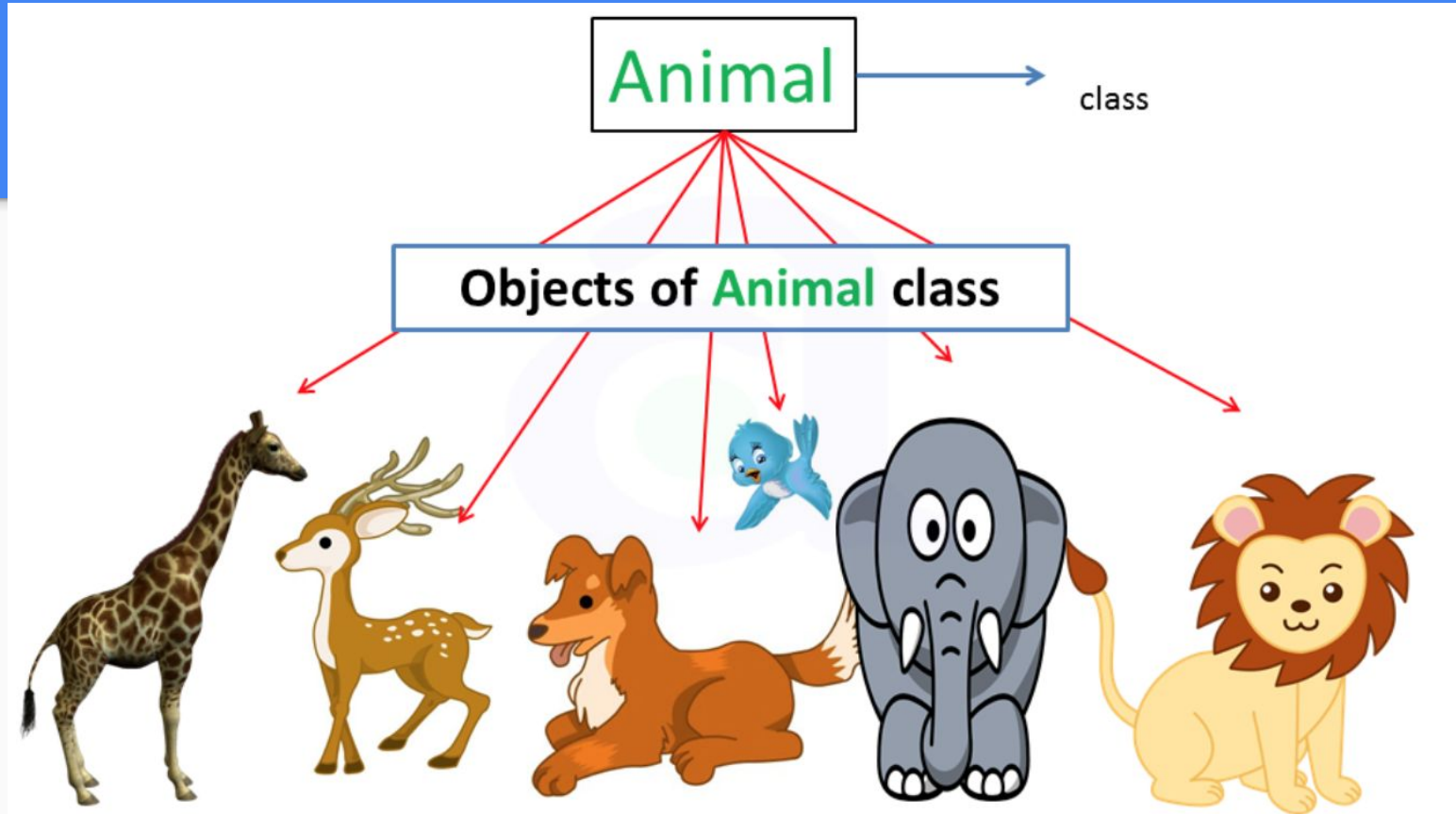A class is a user defined blueprint from which objects are created.

Class is template for creating different objects which defines its properties and behaviours.

In order to create an object you need a class

A class contains methods, variables , constructors etc

You can have multiple objects for the same class

Class

Class

Furniture

Furniture is class

These are Objects
Of **furniture** class
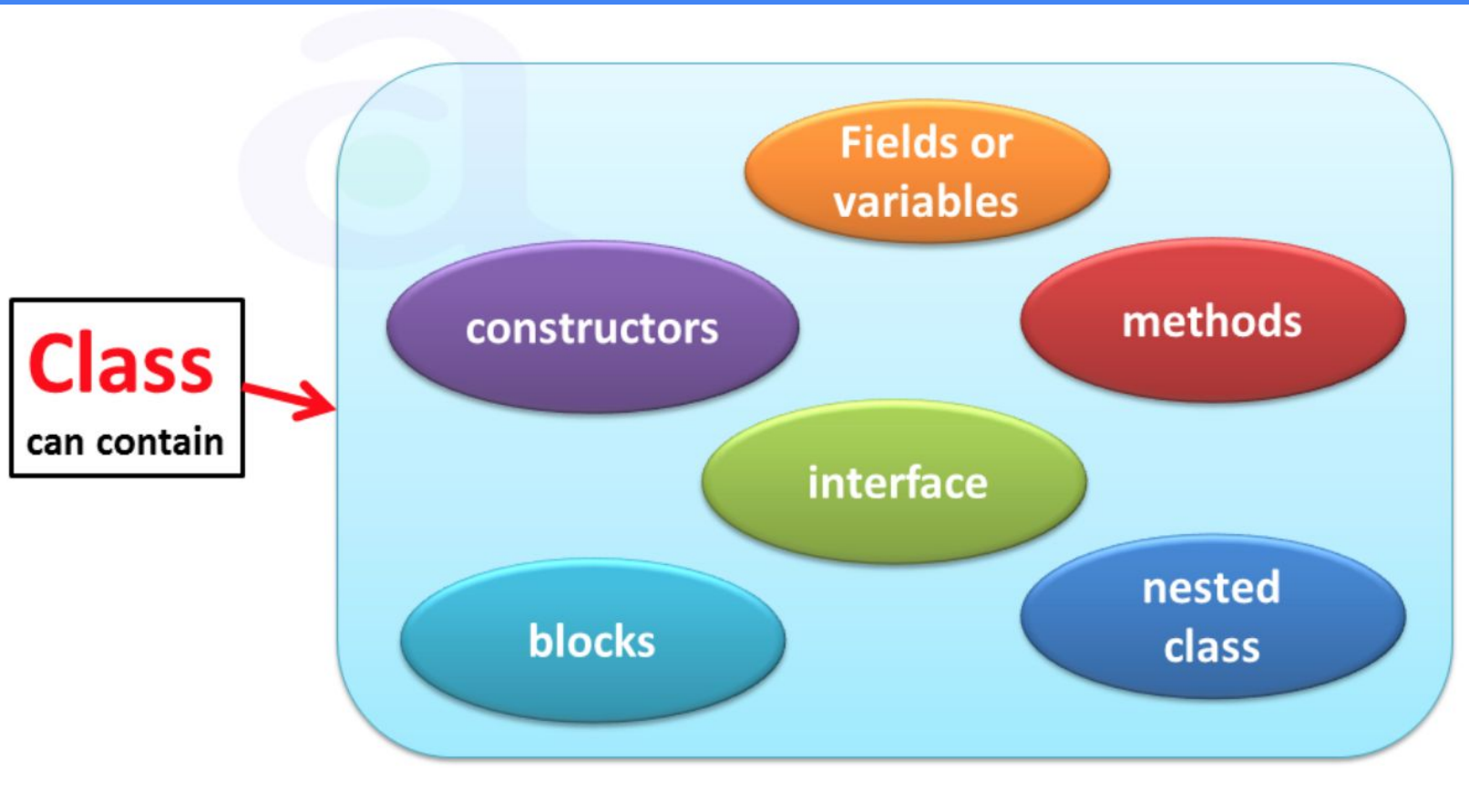1. Chair
2. Table
3. Bed
4. Etc.

Class

```
class Class_name {

    field or variable ;

    method like main() and others ;

}
```

A class in Java can contain:

- fields
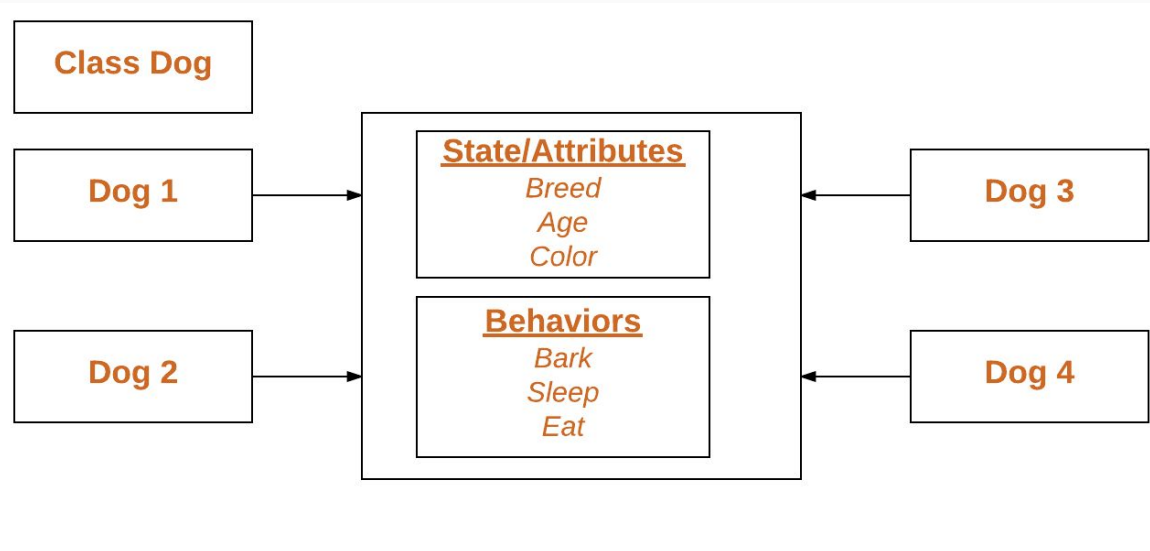- methods
- constructors
- blocks
- nested class and interface

Class

Class

Declaring Objects (Also called instantiating a class)

When an object of a class is created, the class is said to be instantiated. All the instances share the attributes and the behavior of the class

Class Dog		
Dog 1	**State/Attributes** *Breed* *Age* *Color*	**Dog 3**
Dog 2	**Behaviors** *Bark* *Sleep* *Eat*	**Dog 4**

Object

Object is a basic unit of Object Oriented Programming and represents the real life entities.

An object consists of :

State: It is represented by attributes of an object. It also reflects the properties of an object.

Behavior: It is represented by methods of an object. It also reflects the response of an object with other objects.

Identity: It gives a unique name to an object and enables one object to interact with other objects.

Example of an object : chair, pen, table, keyboard, bike, etc

Object

Any entity that has state and behavior is known as an object

They have **states** and **behaviors**.
Examples of **states** and **behaviors**

Example 1:
Object: House
State: Address, Color, Area
Behavior: Open door, close door

Example 2:
Object: dog
State: like color, name, breed,
Behavior: wagging the tail, barking, eating, etc.

Object

Software objects and a real-world objects have very similar characteristics.

Software objects also have a state and a behavior. A software object's state is stored in fields and behavior is shown via methods.

So in software development, methods operate on the internal state of an object and the object-to-object communication is done via methods.

Example

```java
public class Dog {

    // instance variable
    String breed;
    String size;
    String color;
    int age;

    public static void main(String[] args) {
        // create object here
        Dog Dog1Object = new Dog();
        Dog Dog2Object = new Dog();
        Dog Dog3Object = new Dog();

        // Data input for Dog Object 1
        Dog1Object.breed = "Beagle";
        Dog1Object.size  = "Large";
        Dog1Object.color = "Light Gray";
        Dog1Object.age   = 5;

        // Data input for Dog Object 2
        Dog2Object.breed = "Buldog";
        Dog2Object.size  = "Large";
        Dog2Object.color = "Orange";
        Dog2Object.age   = 6;

        // Data input for Dog Object 3
        Dog3Object.breed = "German Shepherd";
        Dog3Object.size  = "large";
        Dog3Object.color = "white and Orange";
        Dog3Object.age   = 6;
```

Task

1. Create a Class "Phone". Create 3 Objects of it: iPhone, Android, Nokia with specific attributes and behaviours.

2. Create a Dog Class and create 3 different objects of it: Husky, Bulldog, Labrador with specific attributes and behaviours.