

one dense sheet of everything class 11's Java carries forward

## Class, object, constructor: the vocabulary

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- a **class** is a blueprint: it declares fields for state and methods for behaviour, an **object** is one instance created from it with `new`
- a **constructor** shares the class's own name and has no return type, not even void, it runs once when an object is created and sets up its starting fields
- this** refers to the current object, used inside a constructor or method to tell a field apart from a parameter that shares its name
- a class can declare more than one constructor with different parameter lists, called **constructor overloading**, the compiler picks the match for the call actually made

## Methods: the four things that describe one

- every method is described by its name, its parameter list, its return type, and whether it is public or private
- a method whose return type is void returns no value at all, any other return type must return a value of that type on every path through it
- arguments are passed by value: a primitive argument is copied in, an object argument's reference is copied in, so the method can change the object's own fields but never replace the caller's variable with a different object
- static** fields and methods belong to the class itself, not to any one object, and are reached through the class name rather than through an instance

## The four pillars, one line each \*

### Encapsulation

fields kept private, reached only through public methods, so the class controls its own state

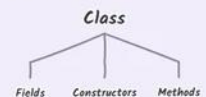
### Inheritance

a subclass extends a superclass and reuses its fields and methods without copying any code

### Polymorphism

one method call behaves differently, decided by overloading within a class or overriding across a subclass

### Abstraction



an interface or an abstract class states what must be done, hiding how it actually gets done

## Arrays: fixed size, one type, indexed from 0

- an array is declared with its element type and square brackets, then created with `new` and a size that is fixed for good at that point
- every element starts at a default value before anything is assigned: 0 for the numeric types, false for boolean, null for an object type
- length** is a field on the array itself, not a method, so it is written without parentheses after it
- a two dimensional array is really an array of arrays, so in principle each row can hold a different length

