



**Learning Object-Oriented
Programming and Design with TDD**

First look at Objects, Classes, Methods and Messages

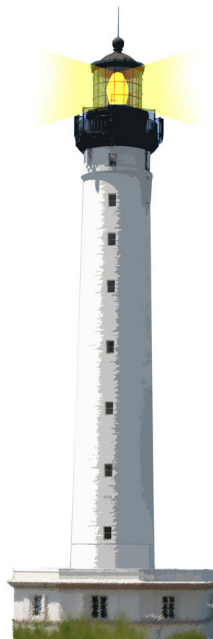
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<http://www.pharo.org>

W1S03



An object

A little entity with:

- state
- behavior
- identity



Example: A turtle object

A little entity with:

- **state**: tilt, pen up or down
- **behavior**: draw on screen
- **identity**: one is different to the other



Example: A file object

A little entity with:

- **state**: a path, a contents
- **behavior**: show contents, change contents, can be renamed
- **identity**: one is different to the other



About Identity and Equality

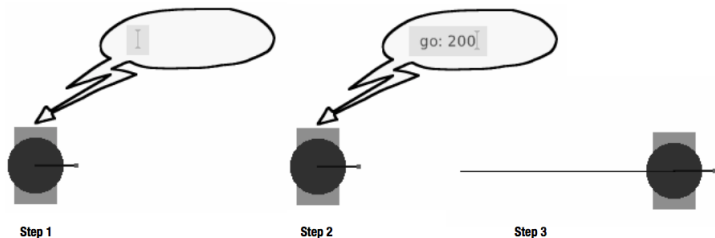
Enter a pizzeria... order a pizza

- **identity**: you eat the pizza of a client
- **equality**: you order the same pizza than a client



An Object Reacts to Messages

aTurtle go: 200



Different objects can understand the same message

Each object may perform a different reaction

aWindow open

aFile open

aZip open



Message Receiver

i.e., the object that receives the message

aTurtle jumpTo: aLocation
"receiver is aTurtle"

aWindow open
"receiver is aWindow"

aFile open
"receiver is aFile"



A method

Named sequence of instructions that will be executed on the message receiver

FrenchPerson >> makeCrepes

Quantité : **Pour 10 crêpes** Préparation : **10 min** Repos : **30 min**

1 50cl de lait entier 100g de Fleur de Maïs Maïzena® + 100g de farine



Dans un récipient, versez 100g de Fleur de Maïs Maïzena® et 100g farine et délayez énergiquement dans 50cl de lait entier.

2 4 œufs battus 2 sachets de Sucre Vanillé alsa®



Ajoutez 4 œufs préalablement battus en omelette ainsi que 2 sachets de Sucre Vanillé alsa®, mélangez à nouveau.

... Laissez reposer 30 minutes ...

3 C'est parti !



Beurrez la poêle et faites cuire votre crêpe sur feu vif puis retournez-la.

Messages vs. Methods

Message: What to do?

stef makeCrepes.
robert makeCrepes.
peter putJamOnCrepes.

Methods: How to do it?



One Message and Multiple methods

One **message** open

Several **methods** named open

Window >> open

...

File >> open

...

Zip >> open

...

A class is Factory of Objects

- A class is an object mould
 - A class creates many instances
- Each instances is still a separate entity
 - You can create mutiple baths and break one.



A class is Factory of Objects

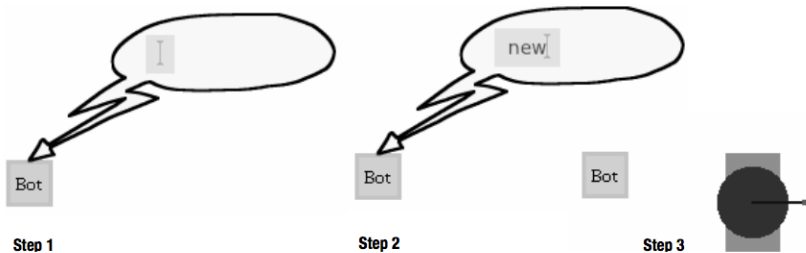
A class

- Defines all the variables of all its instances
- Defines all the behavior of its instances
 - no repetition in all the instances



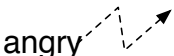
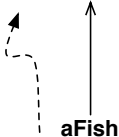
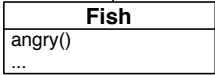
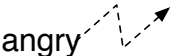
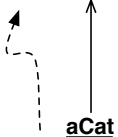
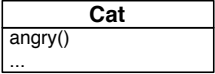
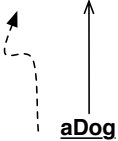
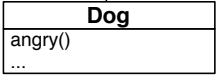
Message new creates objects

```
Turtle new  
>>> aTurtle
```



```
File new  
>>> aFile
```

Methods are looked up dynamically in the class of the receiver



Summary

- An object is a unique entity instance of a class.
- A class specifies the shape and behavior of all its instances.
- An object receives messages and executes corresponding methods.
- A message is: What to do.
- A method is: How to do it.
- Different objects can understand the same message and execute different methods.

But we will see that again in the future lectures!



A course by Stéphane Ducasse
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Reusing some parts of the Pharo Mocc by

Damien Cassou, Stéphane Ducasse, Luc Fabresse
<http://mocc.pharo.org>



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