



SAPIENZA  
UNIVERSITÀ DI ROMA

# *Programming Example*

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# Subject: Computer science technologies

- **School: Technical High school  
Computer science**
- **Class : 1° Year**



# *Knowings:*

- **Structure & fundamental characteristics of a programming system**
- **fundamental characteristics of numbering systems used in computer science**
- **Operating system structure**
- **fundamental characteristics of a word processor**
- **How to make a presentation**
- **fundamental characteristics of a spreadsheet.**
- **Fundamental structure of the internet**
- **What is an algorithm**



# *skills:*

- **Acquairing with computer science tools to use the in other fields.**
- **Acquairing with procedures to solve problems.**
- **To recognize how to manage & to control information and communication in technology, scientific & economics field.**
- **Be able to work in laboratory to apply theory in practical situations**





# *Competences:*

- **Be able to recognize functional characteristics of a computer.**
- **Be able to recognize & to use basic functions of an operating system**
- **Be able to create, to format , to complete a word text, a spreadsheet, a presentation.**
- **Be able to use the internet to search data fonts, to communicate & share informations. Be able to know limits & risks of the internet use.**
- **Be able to finalize resolutive process of a problem.**



# *Kind of teaching*

- **What kind of lesson are you doing to do:**

**frontal, flipped,\* discussion,  
conceptual maps.....**



# *Flipped lesson 1/6*

**A flipped classroom flips, or reverses, traditional teaching methods. Traditionally, the teacher talks about a topic at school and assigns homework that reinforces that day's material.**





# *Flipped lesson 2/6*

**In a flipped classroom, the instruction is delivered online, outside of class. Video lectures may be online or may be provided on a DVD or a thumb drive. Some flipped models include communicating with classmates and the teacher via online discussions.**





# *Flipped lesson* 3/6

**The recorded lecture can be paused, rewound, re-watched and forwarded through as needed. Then, class time is spent doing what ordinarily may have been assigned as homework. Class time may also be spent doing exercises, projects, discussions, or other interactive activities that illustrate the concept.**



## *Flipped lesson 4/6*

**The benefit of the flipped classroom is that teachers have more one-on-one time to help students and explain difficult concepts. If problems are difficult for a student to work through, the teacher is right there to help and explain.**



## *Flipped lesson 5/6*

**If students have questions about the video or online presentation, they can use class time to get questions answered. Recorded lectures work well for students who miss class because of illness, sports, and family vacations.**





# *Flipped lesson 6/6*

**For families, the flipped lesson model provides 24/7 access to content delivered directly from the teacher. This helps parents support their child in a way that is consistent with the way the teacher is teaching it in school.**





# *Educational instruments*

**What kind of instruments are you doing to use:**

**books, e-learning, games, LIM...**



# *Remedial education*

**What kind of remedial education are you going to use for help students with difficulties.**



# *Evaluation*

**With the followings criteria:**

- **Individual level of achieved goals (Knowings & competences )**
- **Progression from the starting point**
- **Interest & Attention**
- **Involvement**
- **Commitment**



# *Verifications*

- **Written tests**
- **Oral discussion**
- **Group work**
- **presentations**





# *Program*

The program depends on guide lines of the actual school system & what department meeting decides about minimum target for the students.



# *Program example*

**The program  
is divided in  
*learning units***



# *Learning unit 1*

## **Data & information:**

**Numbering systems useful in computer science.**

**Binary arithmetics.**

**Information and its digital representation.**

**Multimedia**



# *Learning unit 2*

**Office automation:**

**Word processor**

**Spreadsheet**

**Slide show**





# *Learning unit 3*

**Hardware & network:**

**Computer: architecture & types**

**Types of network**

**Internet: surfing and services**

**Cybersecurity**



# *Learning unit 4*

**Operating systems:**

**Components and services of  
an operating system**

**Windows principal features**

**linux principal features**



# *Learning unit 5*

**Web & Cloud applications:**

**Surf, research and communicate.**

**Share and cooperate.**

**Organize and publish**



# *Learning unit 6*

**Programming:**

**Problems, algorithms, programs.**

**Introduction to Scratch**

**Coding e robotics for learning**





# Useful sites to find interesting material to prepare lessons:



## *Useful sites*

<https://bubbl.us/>

**Brainstorm online with *Bubbl.us*.  
Easily create colorful mind maps to  
print or share with others.**

**Mind map can be very useful for  
student !**



## *Useful sites*

<https://learningapps.org/>

**LearningApps is an intuitive application to create interactive modules to facilitate learning**

**Learning by playing!**



## *Useful sites*

<https://nearpod.com/>

[www.mentimeter.com](http://www.mentimeter.com)

***Nearpod & mentimeter are interactive classroom tools for teachers to engage students with interactive lessons.***

**Useful to get attention from students**





## *Useful sites*

<https://www.symbaloo.com/>

**Save bookmarks and favorite websites online.**

**Built for educators, Symbaloo makes it easy to engage students by delivering the right content, in the right place, at the right time, to the right person.**

**Good for teachers & students.**



## *Useful sites*

<https://kahoot.it/>

***Kahoot!* is a free game-based learning platform that makes it fun to learn – any subject, in any language, on any device, for all ages!**

**Good especially for younger students!**



## *Useful sites*

<https://www.liveworksheets.com/>

**Make interactive worksheets from PDF,  
DOC...**

**Worksheets that listen, speak, correct  
themselves and save paper, ink and  
time.**



## *Useful sites*

<http://www.sciencegamecenter.org/games/purposegames>

***PurposeGames*** is a website that allows users to play and create games in a variety of subject areas.





## *Useful sites*

<https://edpuzzle.com/>

**Intuitive video editor includes the ability for both teachers and students to add voice-overs, comments, resources, and quizzes to existing online videos.**



## *Useful sites*

[http://www.imagechef.com/ic/  
word\\_mosaic/](http://www.imagechef.com/ic/word_mosaic/)

**To create a mosaic of words.  
Useful to remember technical  
words.**



## *Useful sites*

<http://www.snappywords.com/>

**Online interactive English dictionary and thesaurus that helps you find the meanings of words and draw connections to associated words. You can easily see the meaning of each by simply placing the mouse cursor over it.**