Using Fedora in the classroom

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Lebanon Evangelical School for Boys and Girls
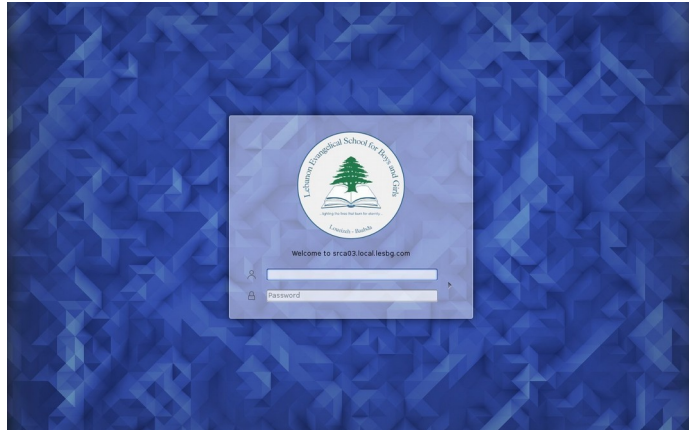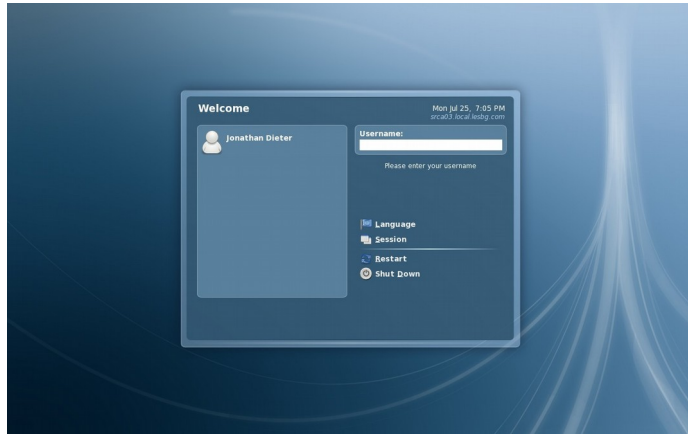http://www.lesbg.com

Lebanon Evangelical School

- Founded in 1860

- Roughly 1600 students from 3-18

- Switched to Linux on servers in 2005

Fedora in our school

- Switched workstations to Fedora 8 in 2008

- Using Fedora 23 right now

Why *not* do it?

- Need local expertise
- Update treadmill ← No longer a problem with Fedora's QA
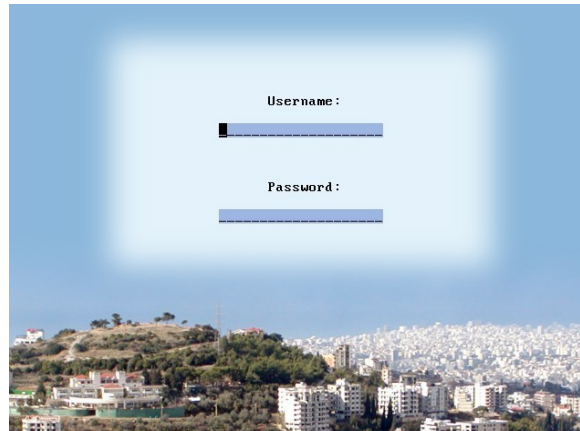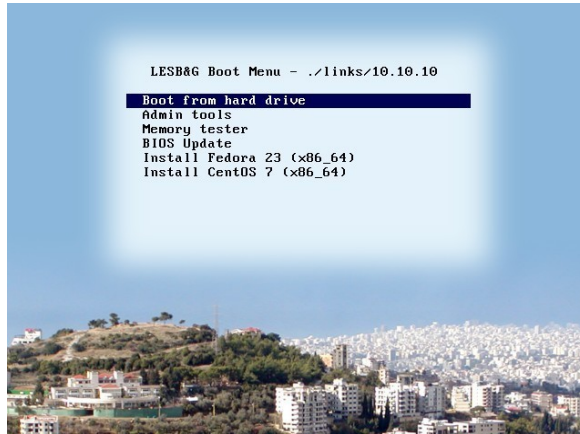- It's different ← Never a good argument

Why do it?

No viruses

Fewer crashes

No licensing fees

More Control

Administrative tools

FreeIPA

- User administration
- Both web and command line interface
- Provides accountability
- Every student and staff member gets a username
- Students are allowed to use school systems before and after school

iPXE

- All machines boot off the network

- Default is to then boot off the hard drives

- Must be authenticated to access Admin tools

- Authentication is over https

- System imaging options in Admin tools

LESSON

- Web-based marking system
- Used at our school for over ten years
- Is now central management system for the whole school
- Source on Github under GPL
- Initial configuration *extremely* difficult!

Ansible

```
ansible@ansible:/etc/ansible/lesbg                                    x
File  Edit  View  Search  Terminal  Help
TASK: [workstations-school-net | set package manager to dnf] *****************
ok: [srca03.local.lesbg.com]

TASK: [workstations-school-net | set strict mode to False] ********************
changed: [srca03.local.lesbg.com]

TASK: [workstations-school-net | clear cache cookies] *************************
changed: [srca03.local.lesbg.com]

TASK: [workstations-school-net | install GNOME Desktop for < F21] ************
skipping: [srca03.local.lesbg.com]

TASK: [workstations-school-net | install GNOME Desktop for >= F21] ***********
changed: [srca03.local.lesbg.com]

TASK: [workstations-school-net | install yum langpack support] ***************
skipping: [srca03.local.lesbg.com]

TASK: [workstations-school-net | install dnf langinstall support] ************
ok: [srca03.local.lesbg.com]

TASK: [workstations-school-net | install multiple language support] **********
changed: [srca03.local.lesbg.com] => (item=en_US)
changed: [srca03.local.lesbg.com] => (item=en_GB)
changed: [srca03.local.lesbg.com] => (item=ar_LB)
changed: [srca03.local.lesbg.com] => (item=fr_FR)
changed: [srca03.local.lesbg.com] => (item=hy)

TASK: [workstations-school-net | install LibreOffice] ************************
ok: [srca03.local.lesbg.com]

TASK: [workstations-school-net | prepare to install Fonts] *******************
changed: [srca03.local.lesbg.com]

TASK: [workstations-school-net | install Fonts] ******************************
```

- Task-based configuration

- Changes are quick

- Deployment also quick

- Designed to be repeatable

Teaching tools

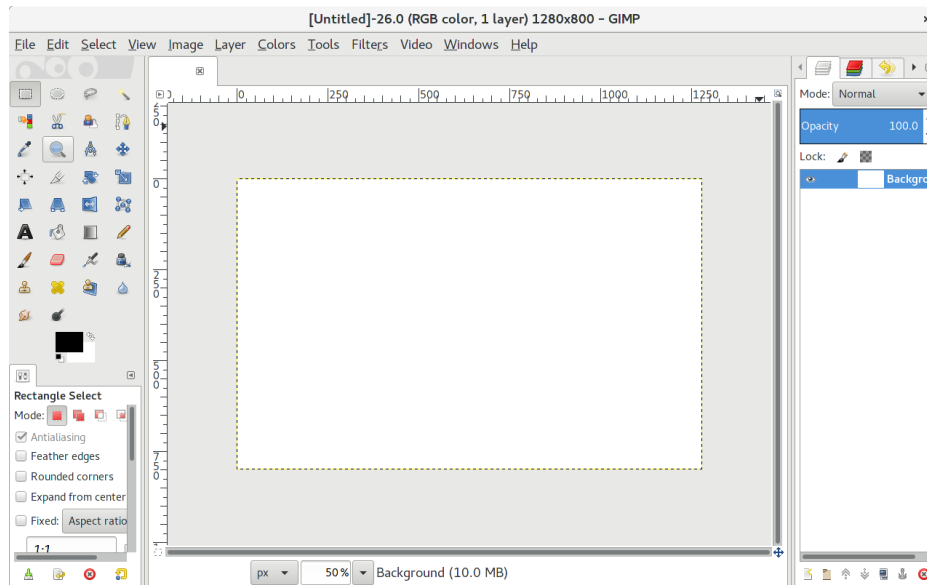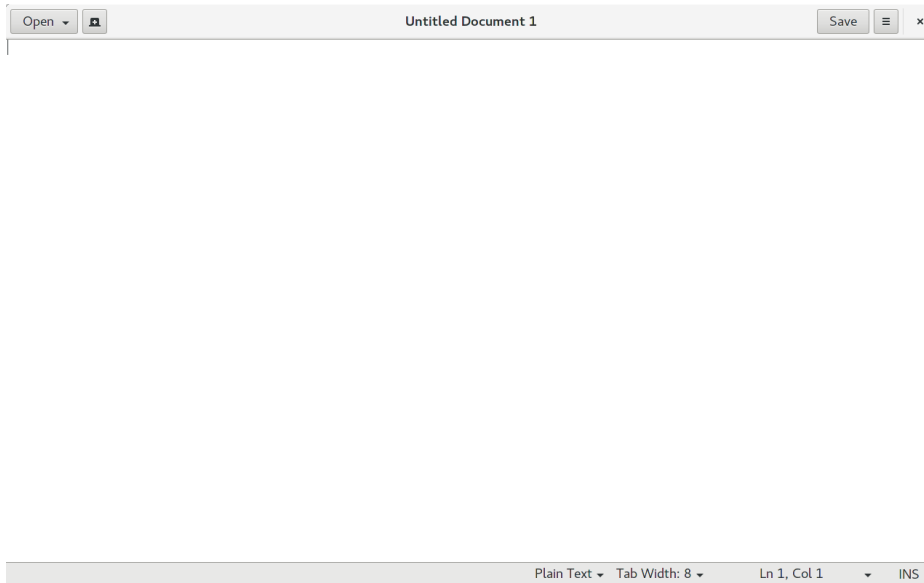# Libreoffice
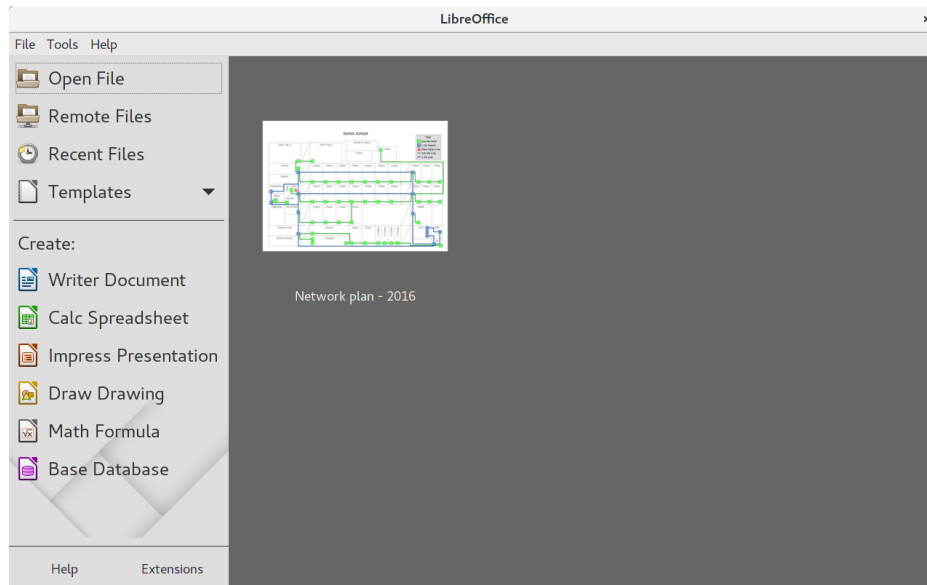
- Word processing

- Spreadsheets

- Presentations

The GIMP

- Used to teach photo editing
- Single-window mode makes it usable
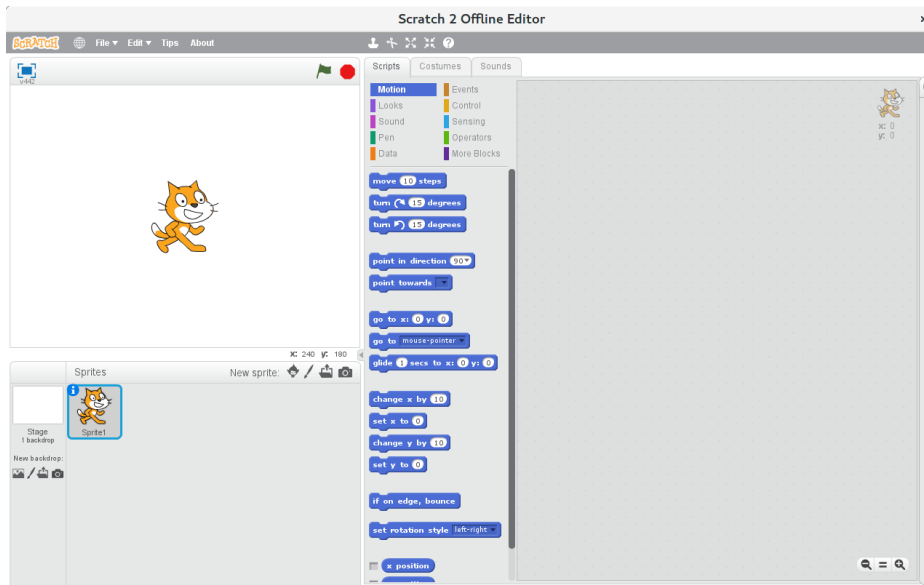
gedit

- Text editor
- Has syntax highlighting
- Has automatic indentation
- Used to teach HTML and CSS

Blender
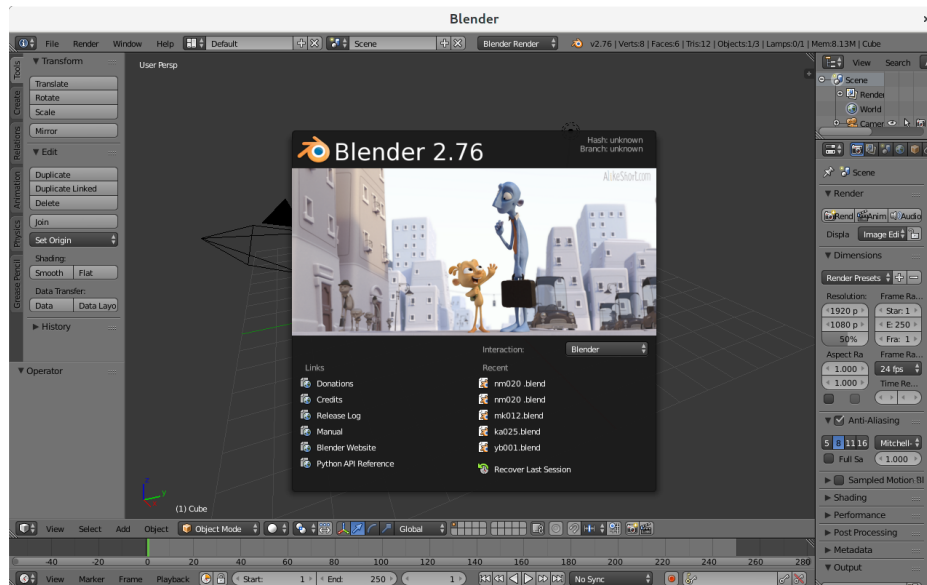
- Used for 3D modeling
- Steep learning curve
- Incredibly powerful

Scratch

- Graphical programming language

- Easy to understand

- Version 2 not available in Fedora because it requires Adobe AIR

- Spec to build RPM in links

- Version 3 will be HTML5 (hopefully)

Python

```
                    jonathan@jdlaptop:~                          x
File  Edit  View  Search  Terminal  Help
Python 2.7.12 (default, Jul 18 2016, 10:55:51)
[GCC 6.1.1 20160621 (Red Hat 6.1.1-3)] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

- Programming language

- Fun to teach

- Easy for beginners

- Very powerful

Curriculum
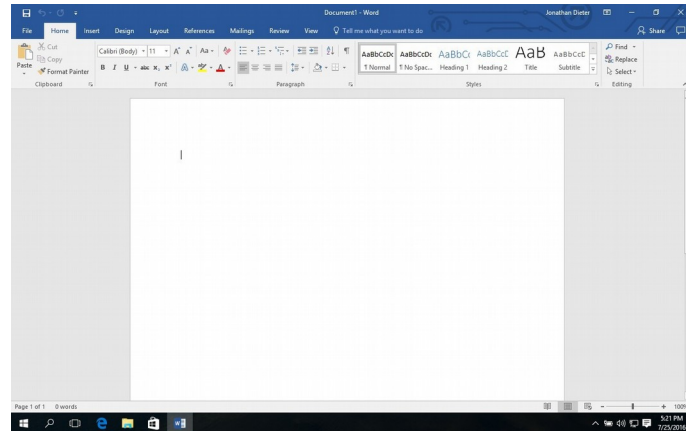
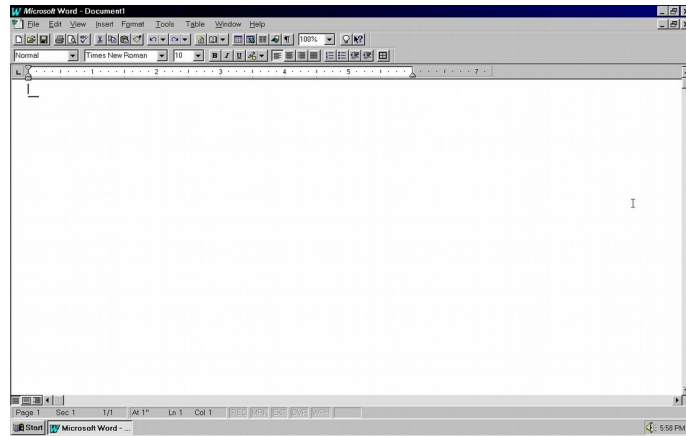# Theory of computer education

Memorization

VS

Comprehension

Software changes

- Word 95 vs Word 2016

- Many changes

- If students are forced to memorize how to use Word 95, they will struggle to use Word 2016

- If they understand how/why things actually work, then the changes will be less difficult

Teacher requirements

- Passion – A teacher must enjoy teaching their subject

- Knowledge – They must have a thorough understanding of what they're teaching

- Compassion – Above all else, a teacher must truly care for *all* of their students, not just the ones that don't cause problems

Curriculum

- Touch typing

- Databases

- Hardware

- Word processing

- Image editing

- Presentations

- Spreadsheets

- HTML

- 3D modeling

- Programming

Word processing
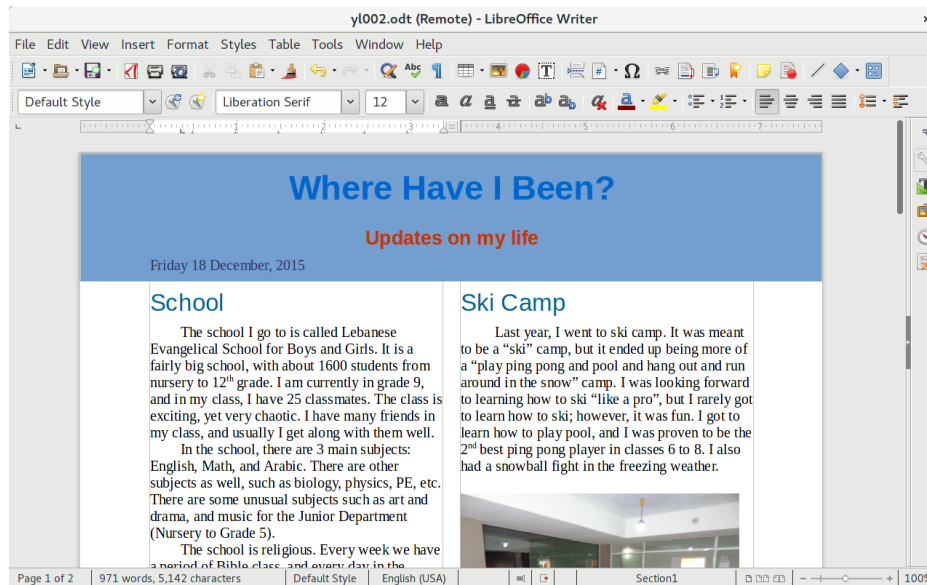
- Columns
- Photos
- Text boxes
- Drawing tools
- Styles
- Giving credit
- Checking licenses

Image editing

- Cropping out the background
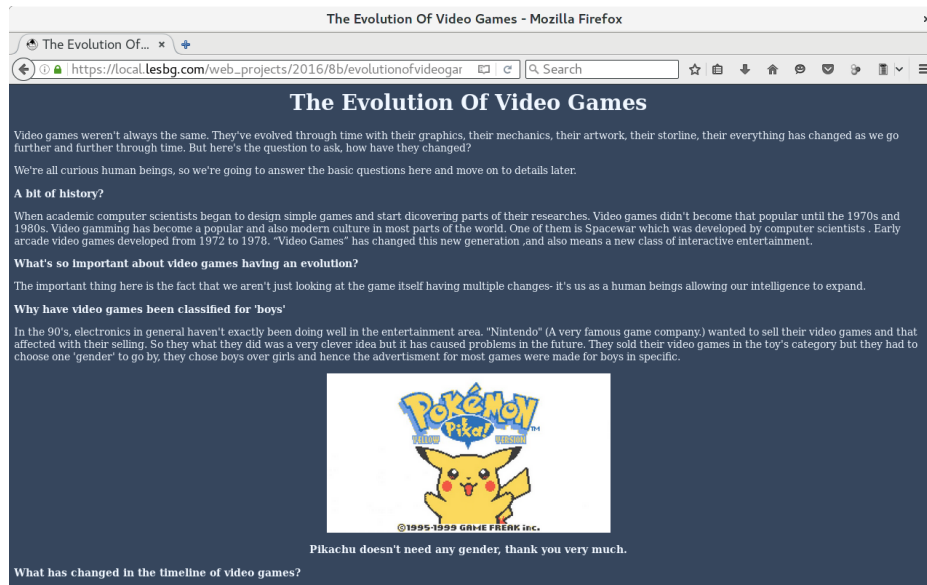
- Adding new things to it

- Ethics of changing photos

Spreadsheets

- Formulas

- How to design invoices

- How to design gradesheets

- Charts

Web page design

- HTML basics
- CSS for a consistent style
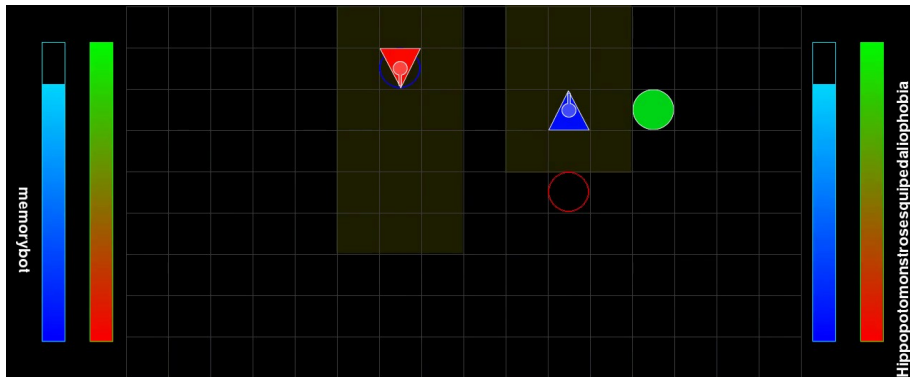- Online privacy

3D modeling

- How to create objects

- How to design materials that look realistic

- Adding textures to make objects look more lifelike

- Animation

Programming

- Basics using Scratch

- Loops and conditionals

- Group project: Make a game

- Advanced programming in Python

- Design a simple AI that can defeat other students' AIs

Goals

- Our students leave the school understanding computer theory

- They have a good grasp on how and why computer applications work as they do

- They understand the importance of the ethics involved in creating and working with digital media

Links

- iPXE: http://ipxe.org/

- LES Ansible plays: https://github.com/lesbg/ansible

- LESSON: https://github.com/lesbg/lesson-1.0

- Scratch: https://scratch.mit.edu

- Scratch 2 RPM spec file: http://lesloueizeh.com/jdieter/scratch2

- LES Scratch projects: http://scratch.lesbg.com

- Botwar: https://github.com/lesbg/botwar