One Laptop per Child and Sugar: Collaborative, Joyful, and Self-empowered Learning

linux users group of davis

LUGOD

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Professor
Information Systems

San Francisco State University

1 sugarlabs

CC BY
Unless noted otherwise

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@sameerverma

Teach

Computer Networks and Databases, Media Creation, Content Management and Delivery.

Free and Open Source, Creative Commons, Licensing, Collaborative Methodologies.

IT Strategy, Compliance, IT Audit, Governance, Identity Management.

Research

Diffusion and Adoption of Innovative Technologies

Service

The Commons Initiative at SF State
http://commons.sfsu.edu

one laptop per child
san francisco

OLPC San Francisco

http://olpcsf.org

Afghanistan
Armenia
Haiti
Honduras
India
Jamaica
Madagascar
Pakistan
Philippines
Senegal
South Africa
Uganda
Tuva

San Francisco

I work directly with...

http://olpcsf.org

Afghanistan
Armenia
Haiti
Honduras
India
Jamaica
Madagascar
Pakistan
Philippines
Senegal
South Africa
Uganda
Tuva

San Francisco

Bhagmalpur,
India

August Town,
Jamaica

Bulun Bazhy, Tuva

OLPC

Mission

OLPC's mission is to empower the world's children through education

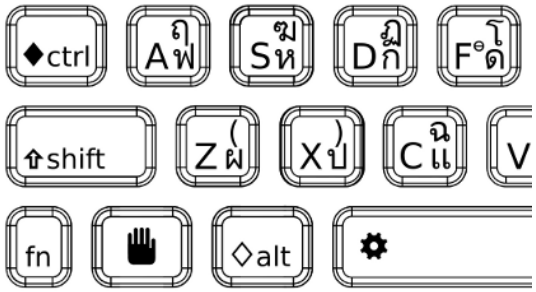
We aim to provide each child with a rugged, low-cost, low-power, connected laptop. To this end, we have designed hardware, content and software for collaborative, joyful, and self-empowered learning. With access to this type of tool, children are engaged in their own education, and learn, share, and create together. They become connected to each other, to the world and to a brighter future.

Worldwide

40+ countries, 30+ languages,
3 million laptops, 350+ applications

one laptop per child

sugarlabs



Grounded in Education

Built from the ground up, for one purpose

Around the world...

School Galadima, Abuja City, Nigeria
See http://wiki.laptop.org/go/Galadima

Samkha village located in the suburbs of northern Thailand
See http://wiki.laptop.org/go/OLPC_Thailand/Ban_Samkha

Khairat school is India's pilot site.
See http://wiki.laptop.org/go/OLPC_India

Mongolia.
See http://wiki.laptop.org/go/Ulaanbaatar

Ethiopia

See http://www.reactivated.net/weblog/archives/2008/10/olpc-ethiopia-updates/

Afghanistan refugee camp, Pakistan
http://wiki.laptop.org/go/OLPC_Pakistan/Atlas_School

Colombia.
See http://wiki.laptop.org/go/OLPC_Colombia

Peru.
See http://wiki.laptop.org/go/OLPC_Peru

Rwanda.
See http://wiki.laptop.org/go/OLPC_Rwanda

Iraq.
See http://wiki.laptop.org/go/OLPC_Iraq

Haiti.
See http://wiki.laptop.org/go/Haiti

Solomon Islands.
See http://wiki.laptop.org/go/OLPC_Solomon_Islands

Nepal.
See http://wiki.laptop.org/go/OLPC_Nepal

Uruguay.
See http://www.ceibal.edu.uy

Australia.
See http://laptop.org.au

West Bank, Palestine. UN Relief and Works Agency
See http://laptop.org/en/children/countries/mideast.shtml

Deployments worldwide

~ 3 million See Google Maps

Also see: http://wiki.laptop.org/go/Property:Number_of_manufactured_laptops

Seymour Papert

https://www.youtube.com/watch?v=FQCZa8MyWIg

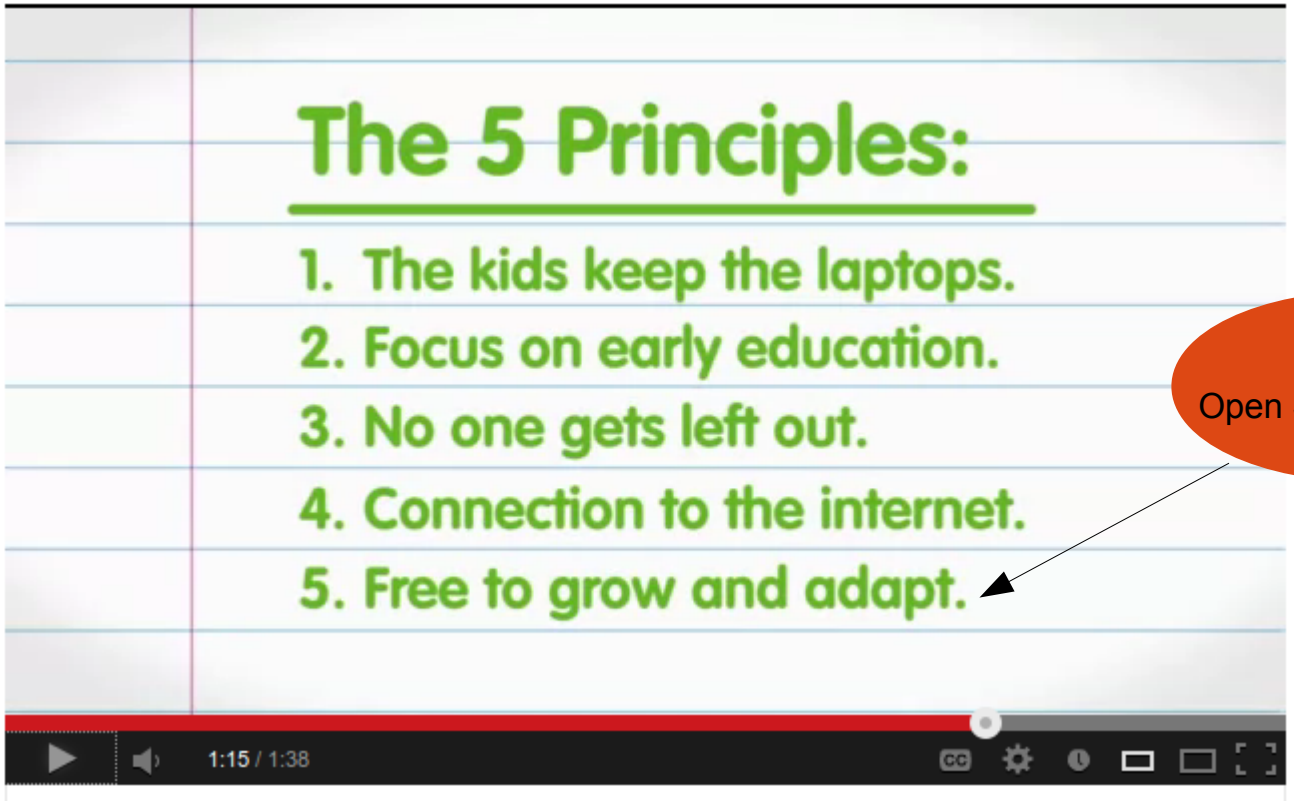
2005

MIT MEDIA LAB

Massachusetts
Institute of
Technology

Kofi Annan and Nicholas Negroponte, World Summit on the Information Society (WSIS) Tunis, Tunisia. Nov 16, 2005

Mission and Principles



Free and
Open Source Software

www.youtube.com/watch?v=c-M77C2ejTw

TED
Ideas worth spreading
IDB
Inter-American Development Bank
UNESCO
SAN FRANCISCO STATE UNIVERSITY
THE UNIVERSITY OF THE WEST INDIES
AT MONA, JAMAICA
Discovery COMMUNICATIONS
OXFORD
UNIVERSITY PRESS
Discovery KIDS
Discovery KIDS
WFP
common sense media
LITTLE PIM
fun with languages
Walmart
Save money. Live better.
MyCityWay
get around smarter
123 SESAME STREET
amazon
NICKELODEON
MTV
MUSIC TELEVISION
BMW i
BMW
Sheer Driving Pleasure

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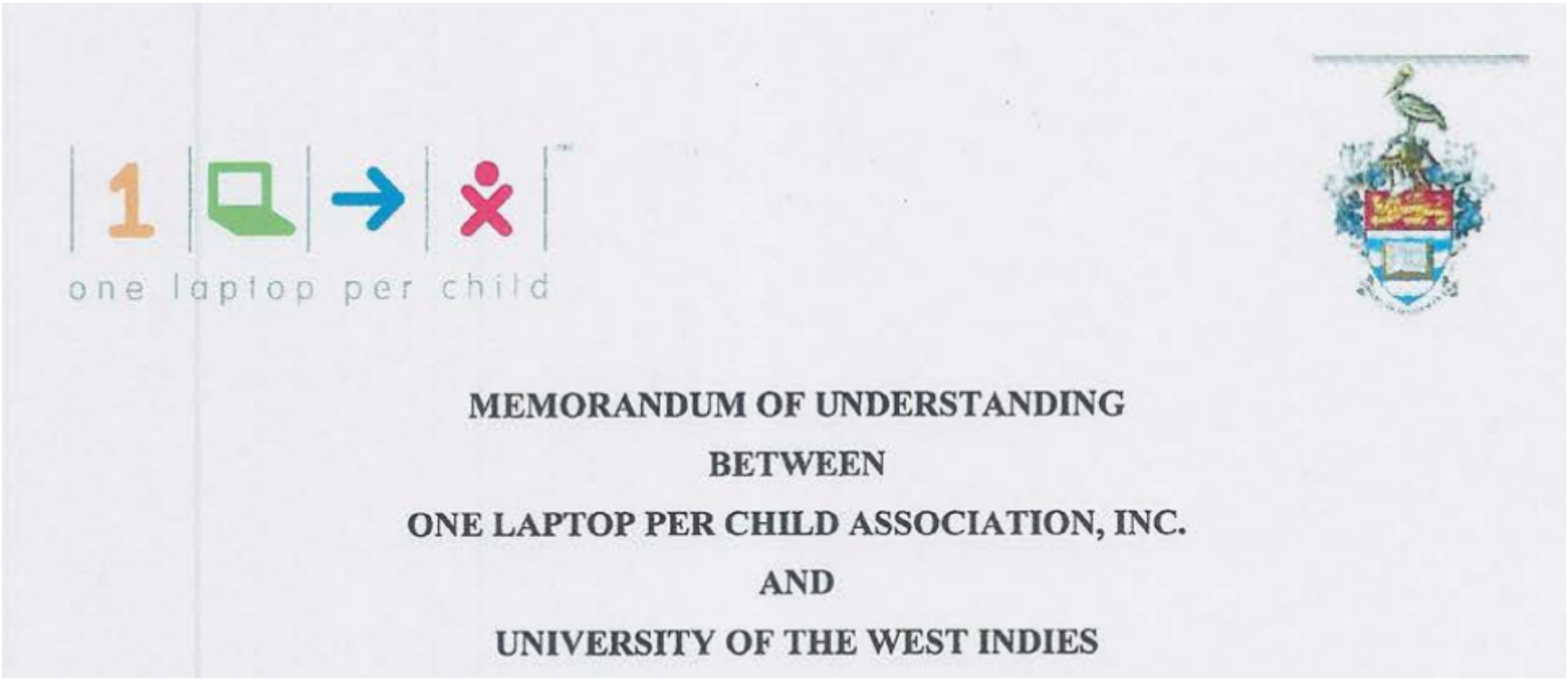
MTV
MUSIC TELEVISION
BMW i
BMW
Sheer
Driving Pleasure

Memorandum of Understanding



Research and Service

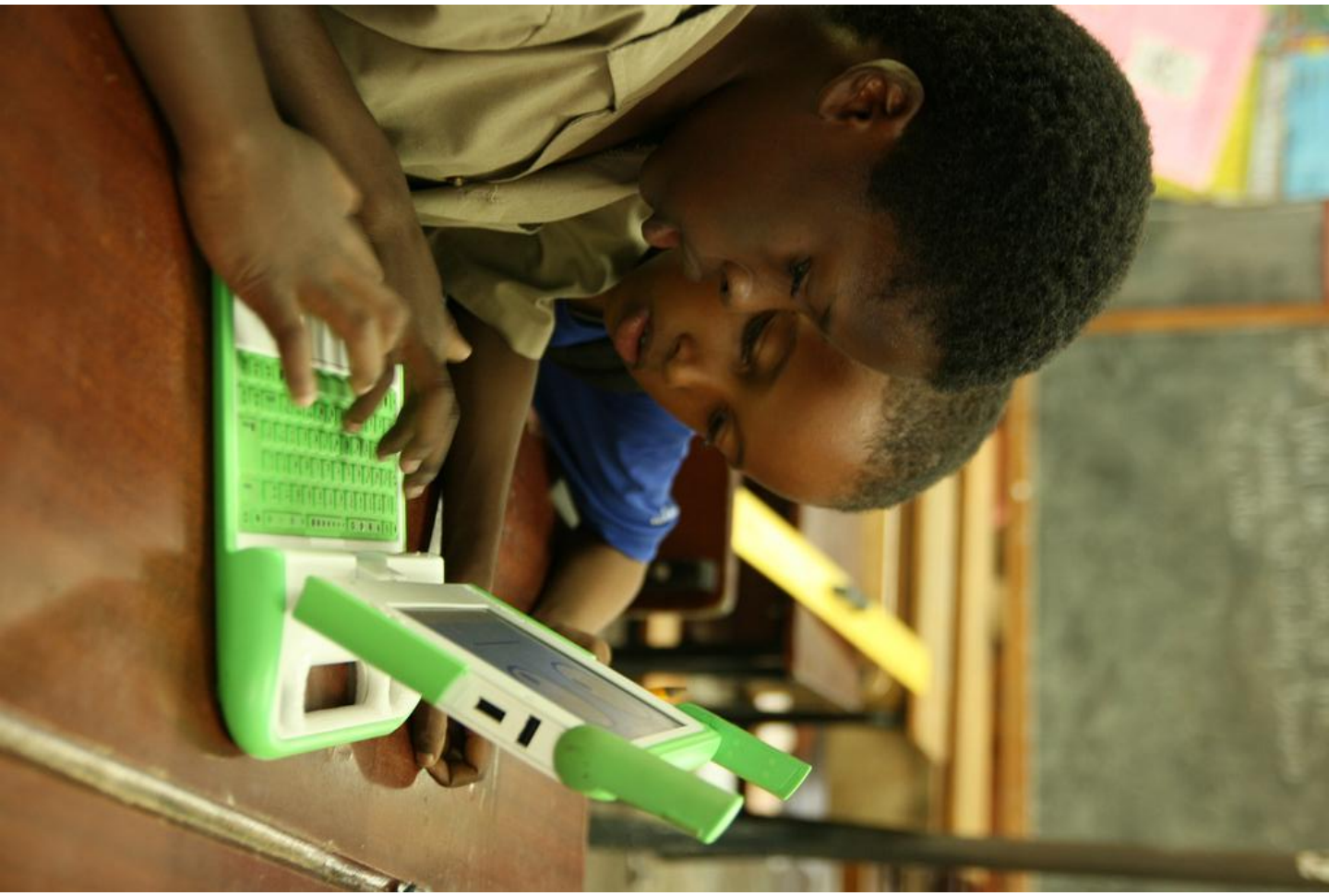
ARTICLE I

OLPC and UWI will use their best efforts to establish a long-term cooperation and collaboration in the field of 1:1 computing in certain primary schools in in Jamaica and the wider Caribbean. OLPC is interested in pursuing opportunities in the areas of Education, Technology and Outreach.

The Parties agree to work together to support the OLPC Jamaica volunteer community through regular meetings, institutional support and the facilitation of OLPC Projects in Jamaica. Further, the parties agree to support faculty research, community service, student projects and internships in the OLPC context. These may include, but are not limited to pedagogical approaches, content generation, software development, hardware testing, network analysis, community outreach and other related topics that go towards ensuring the sustainability of OLPC in Jamaica and the Caribbean.

Pilot Studies

August Town Primary School



Providence Basic School

Mission House Basic School

Moneague College

Memorandum of Understanding

one laptop per child

SAN FRANCISCO STATE UNIVERSITY

MEMORANDUM OF UNDERSTANDING

BETWEEN

ONE LAPTOP PER CHILD ASSOCIATION, INC.

AND

SAN FRANCISCO STATE UNIVERSITY

This Memorandum of Understanding ("MOU") is entered into on December 20,2011 by and between One Laptop per Child Association, Inc. ("OLPC"), a non-profit organization located in Miami, Florida and San Francisco State University ("SFSU"), a university located in San Francisco, California (hereinafter each individually a "Party" and collectively as the "Parties").

WHEREAS, the Parties share a common interest in working together to promote the education around the world. In light of this common mission, the Parties agree to discuss the joint implementation of "One Laptop Per Child" projects in San Francisco Bay Area, California and around the world;

WHEREAS, OLPC anticipates that the expertise of SFSU, its staff and students will be essential to the successful implementation of such programs;

Rural and Remote

Bhagmalpur (भागमलपुर) village,
District Jaunpur, Uttar Pradesh, India

lat + long = http://tinyurl.com/bhagmalpur

On the Internet. First time ever. Circa 2008.

Rural and Remote.

Rural and Remote.

1300+ TED videos offline.

Caste no bar.

The State of Hardware

XO-1

x86
AMD Geode
433MHz

XO-1.5

x86
VIA
1GHz

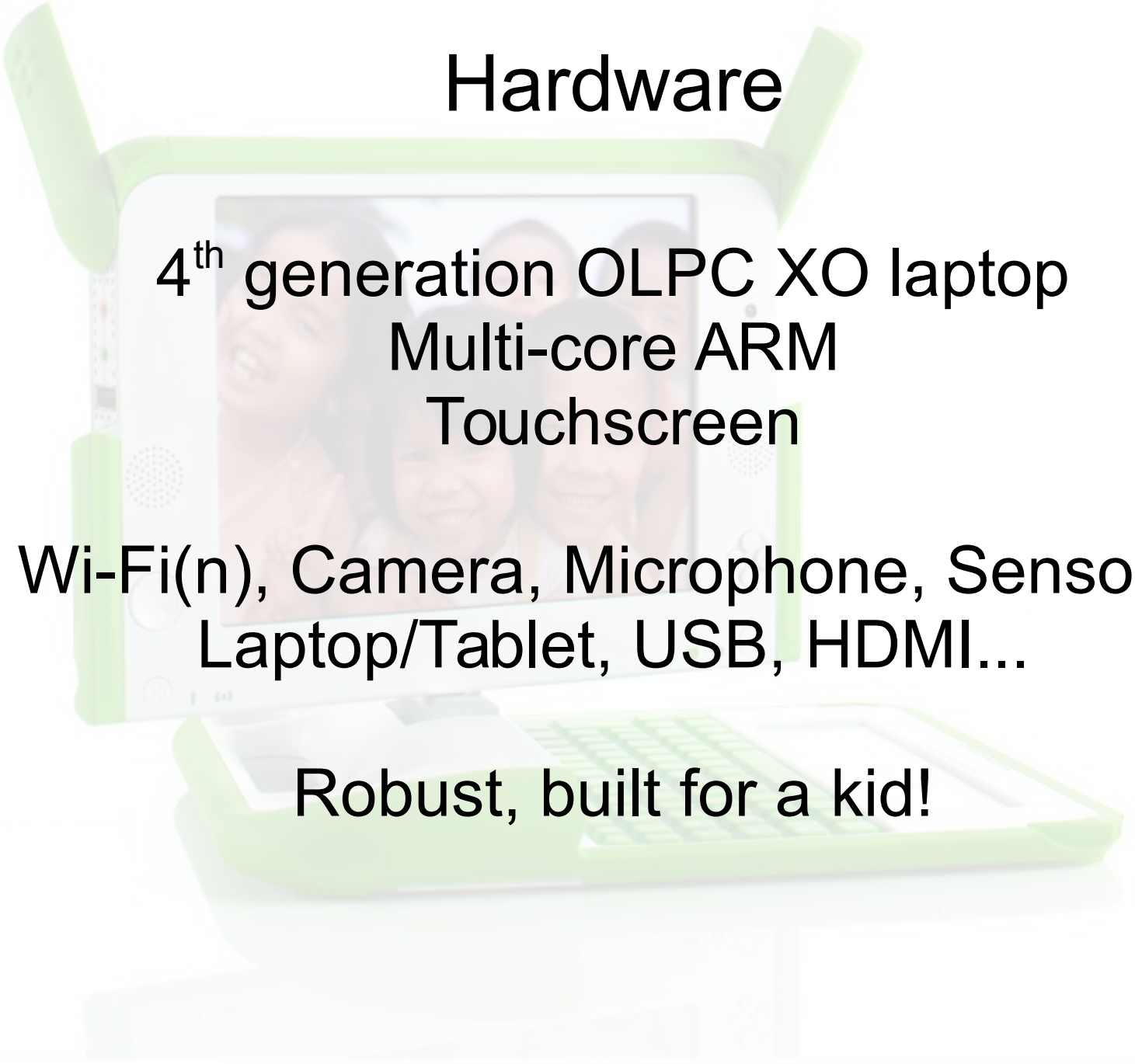
XO-1.75

ARM
Marvell
Armada610 SoC
800MHz
Single core

XO-4

ARM
Marvell
PXA2128 SoC
1GHz
Multi-core
Touch

Hardware



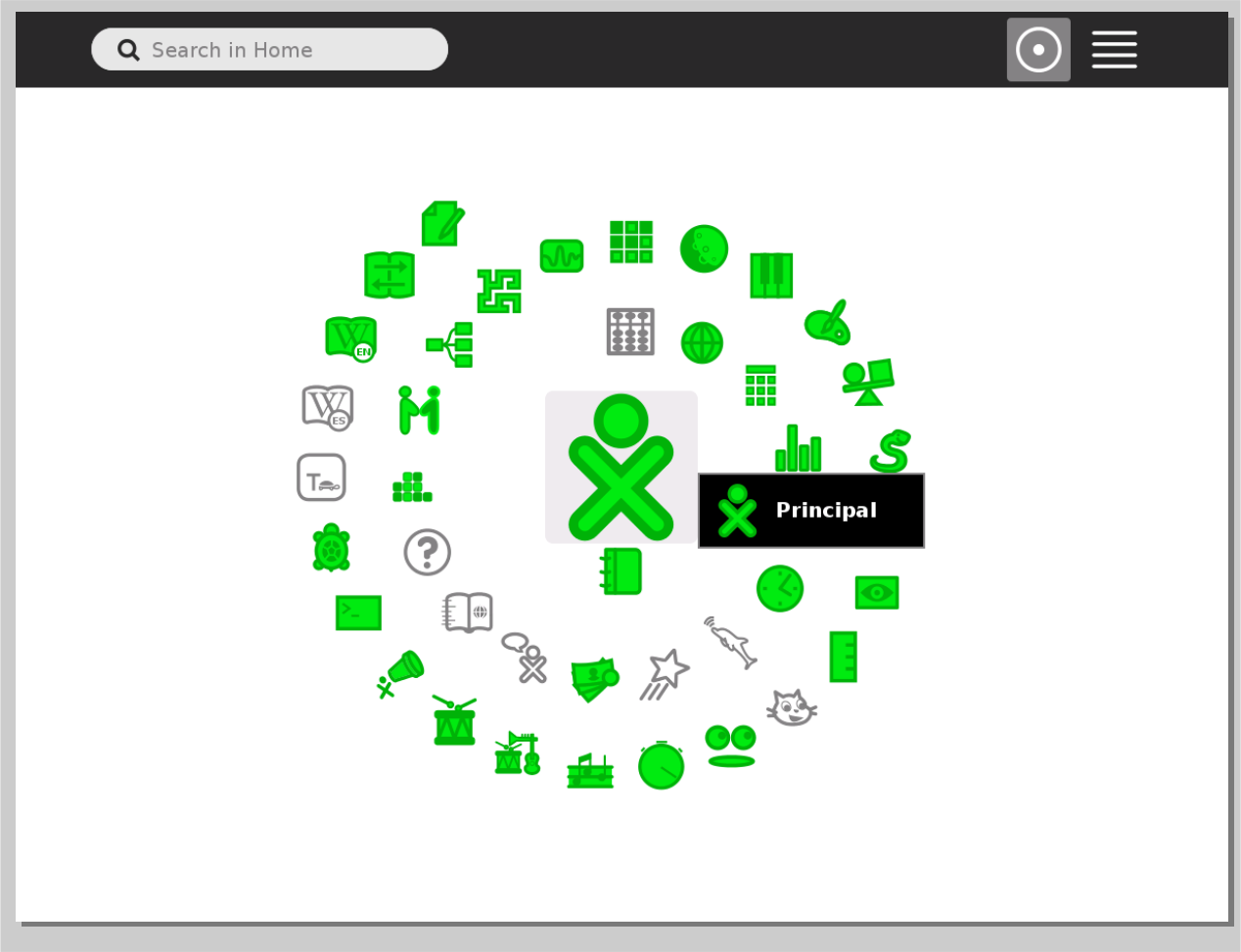
4th generation OLPC XO laptop
Multi-core ARM
Touchscreen

Wi-Fi(n), Camera, Microphone, Sensors, Laptop/Tablet, USB, HDMI...

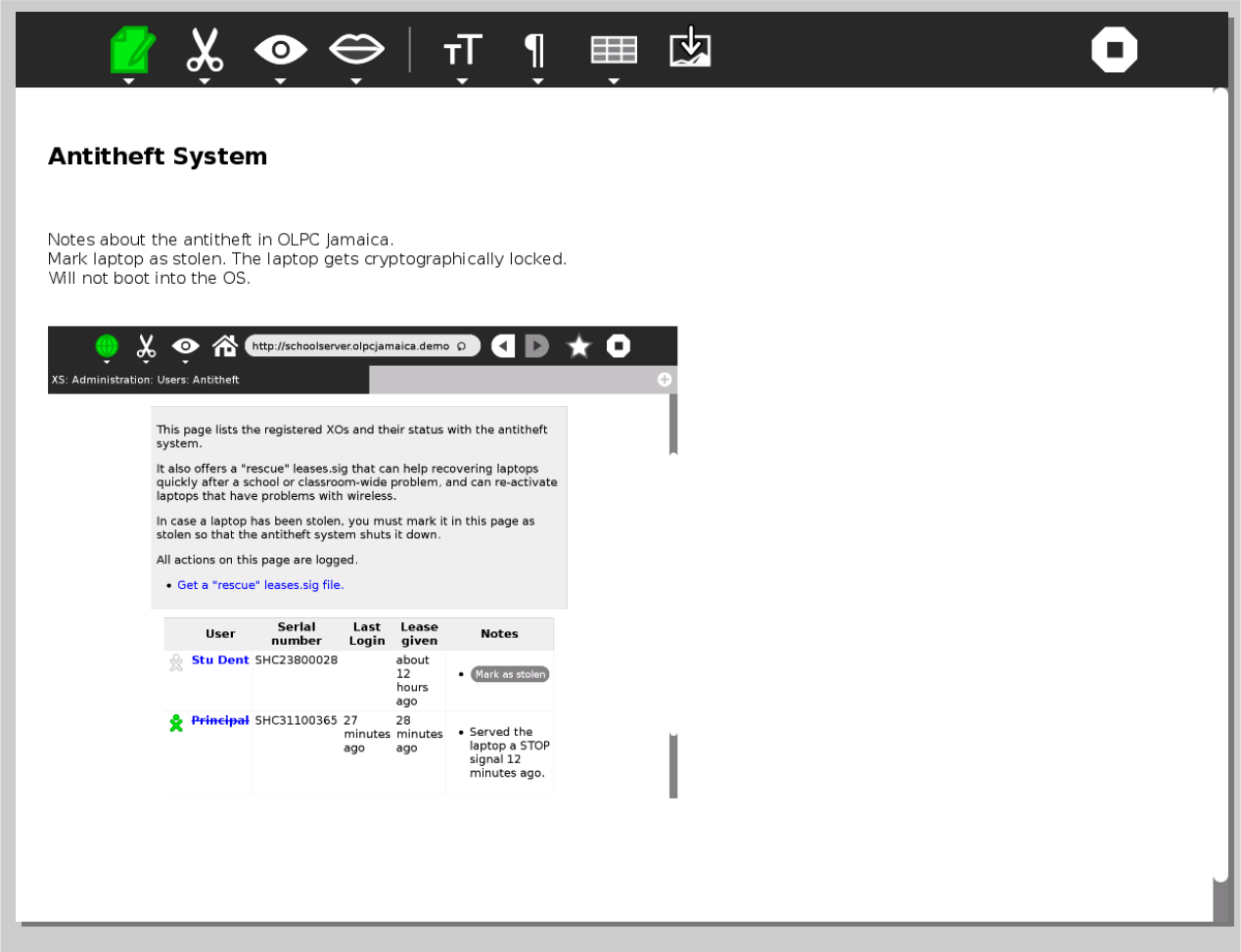
Robust, built for a kid!

Software, Content and Learning

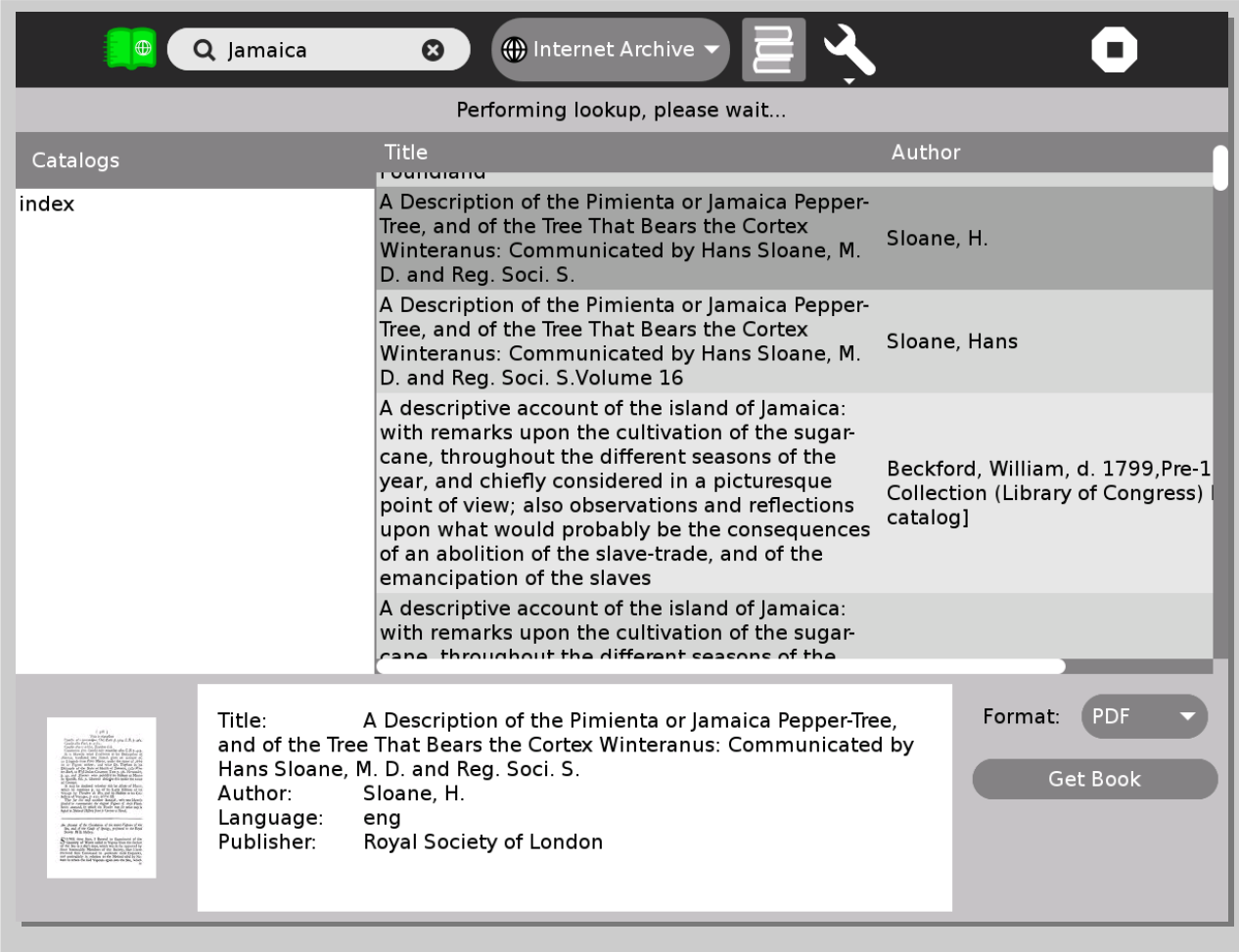
Sugar Learning Environment



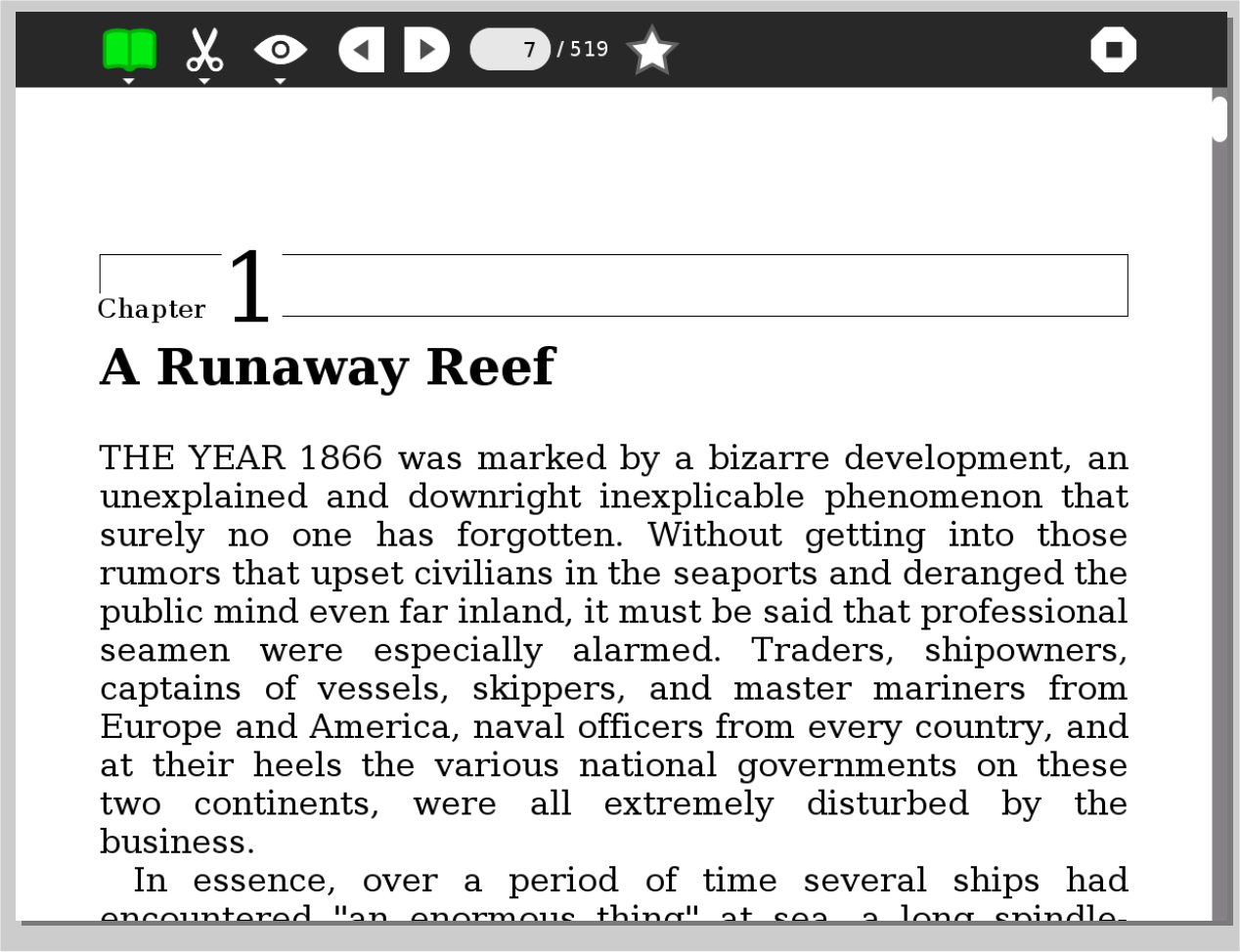
Word Processor



Search for a Book



Read a Book

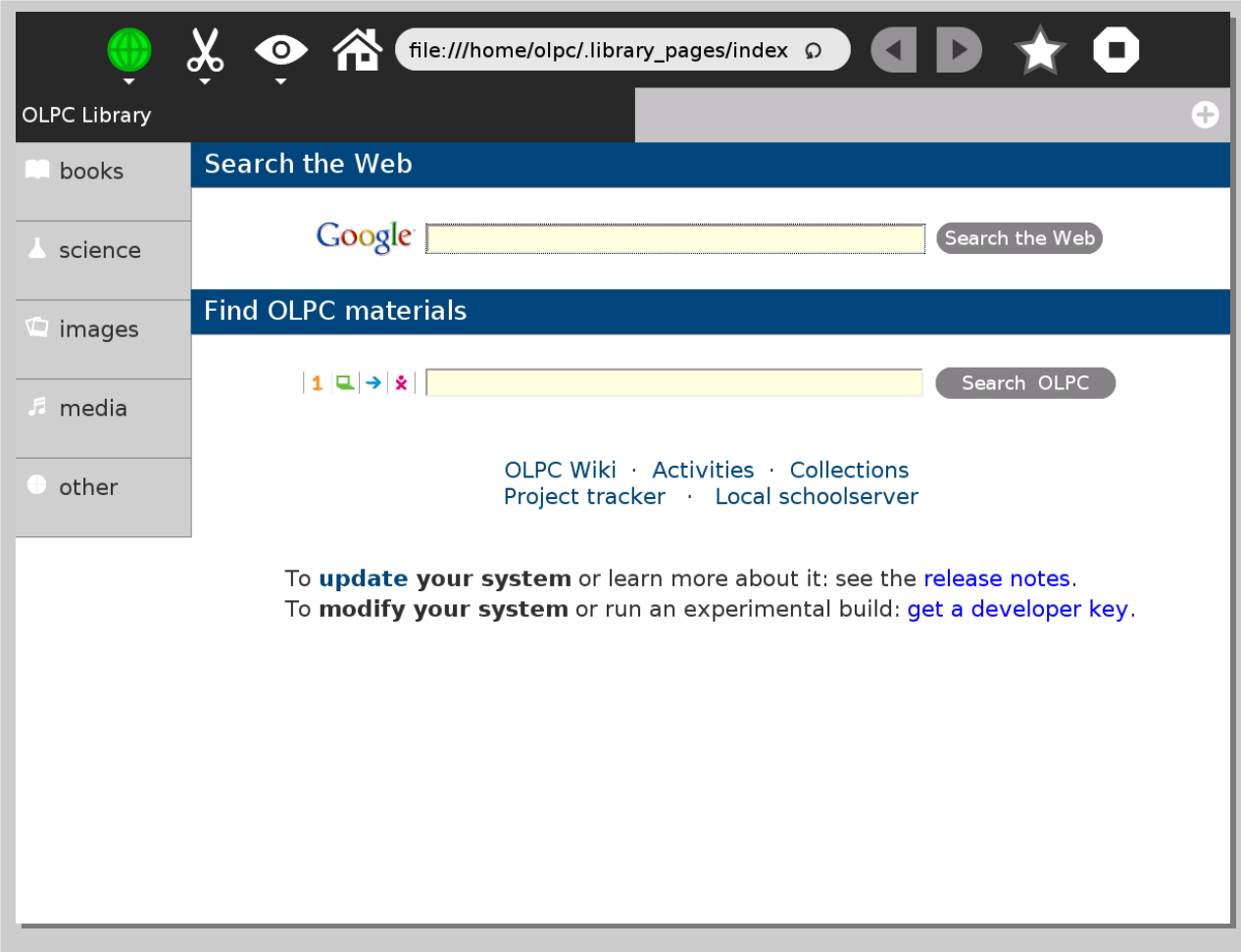


Text-to-speech can read highlighted parts of the book to the child

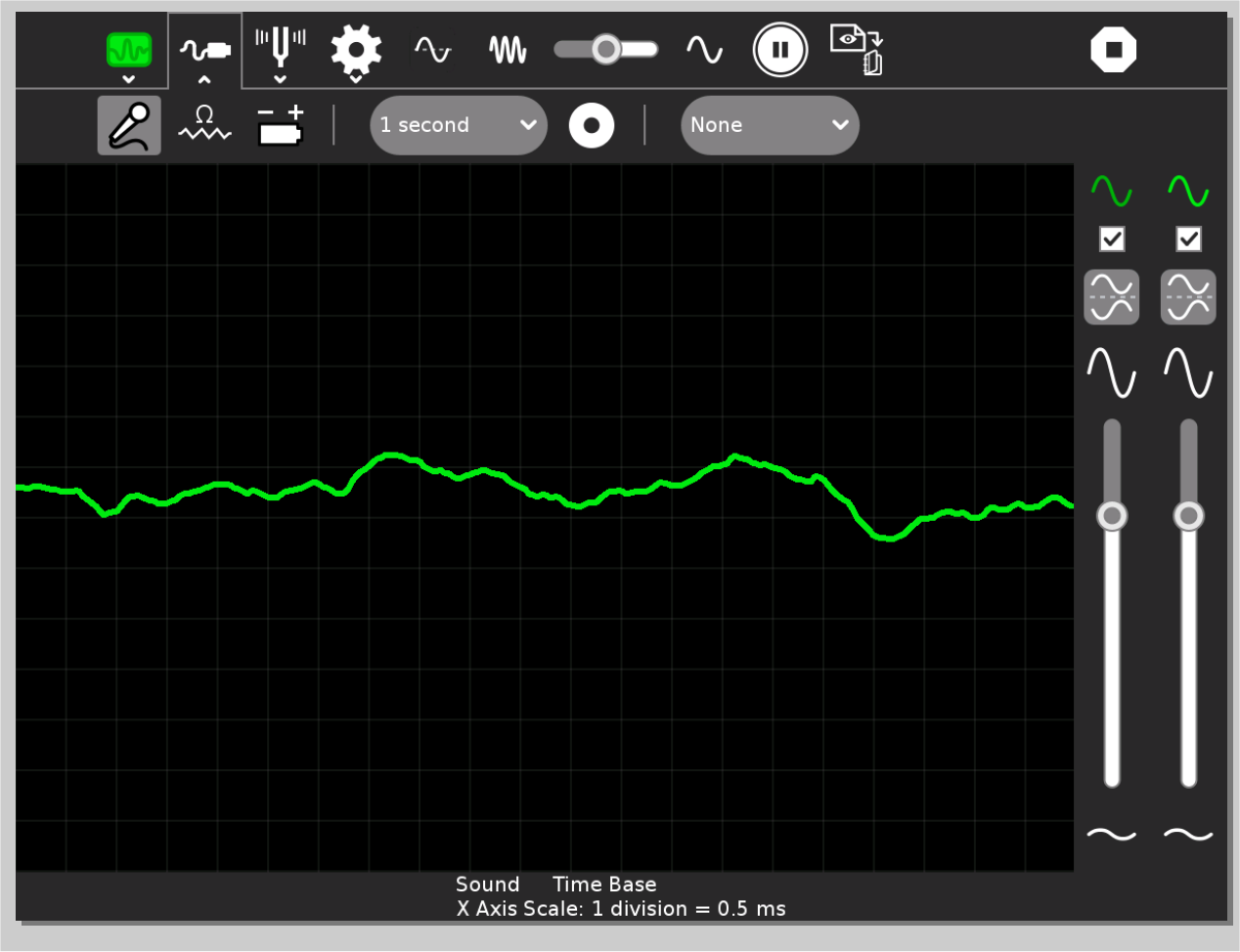
Paint a Picture

Done with a real paintbrush. No capacitive stylus required. Even a twig will do!

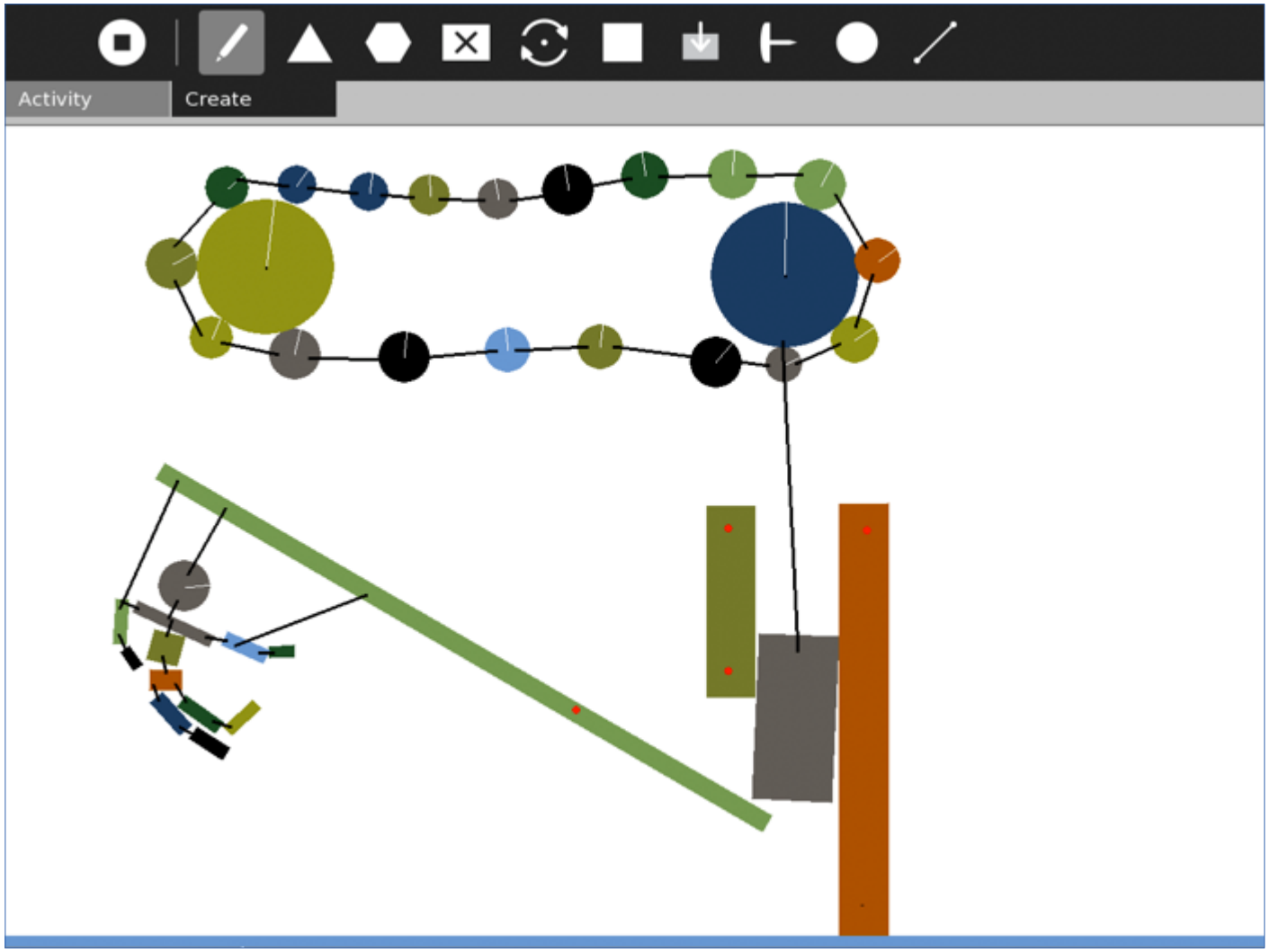
Browse the Web



Work with Sensors

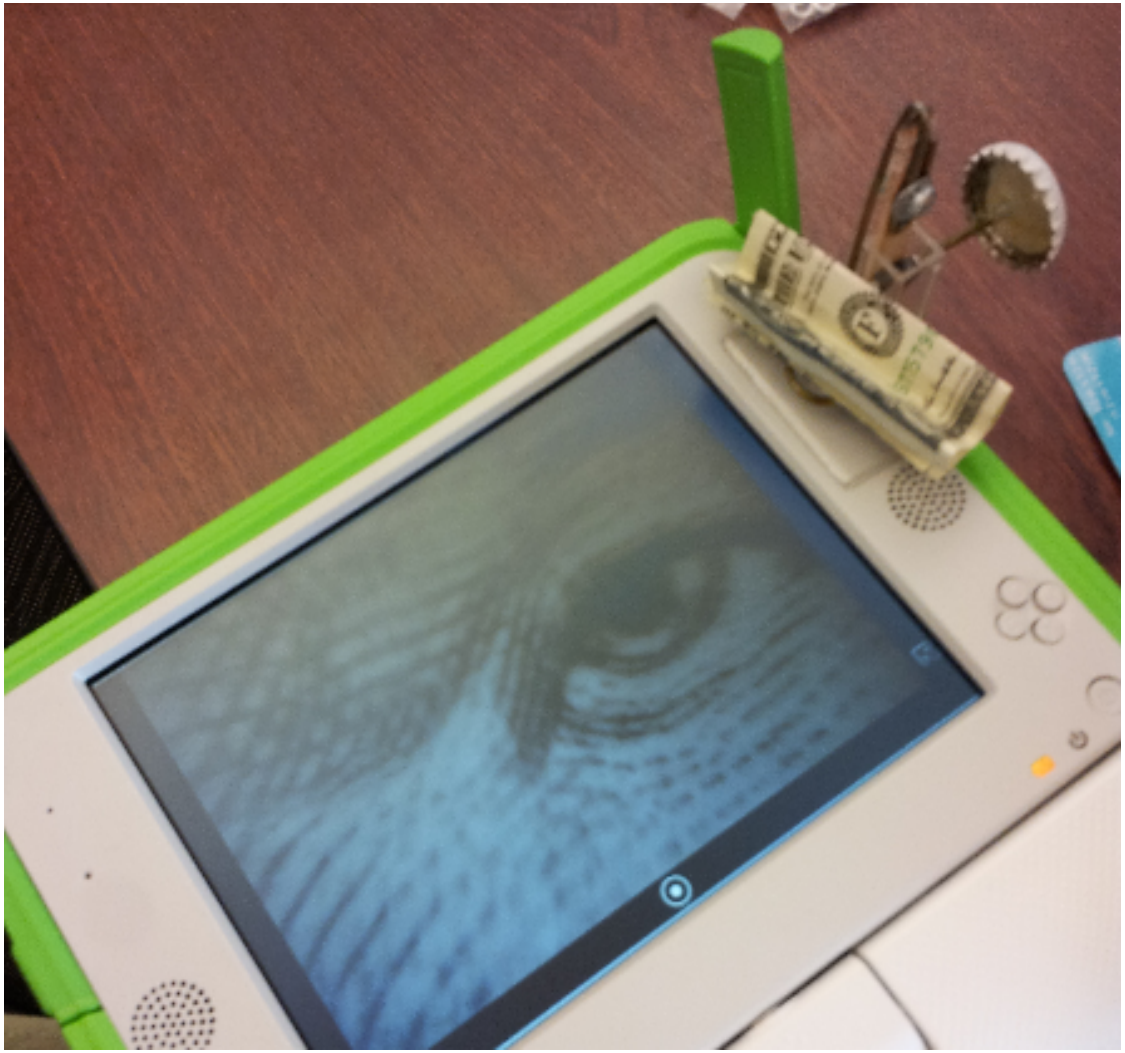


Simulate with Physics

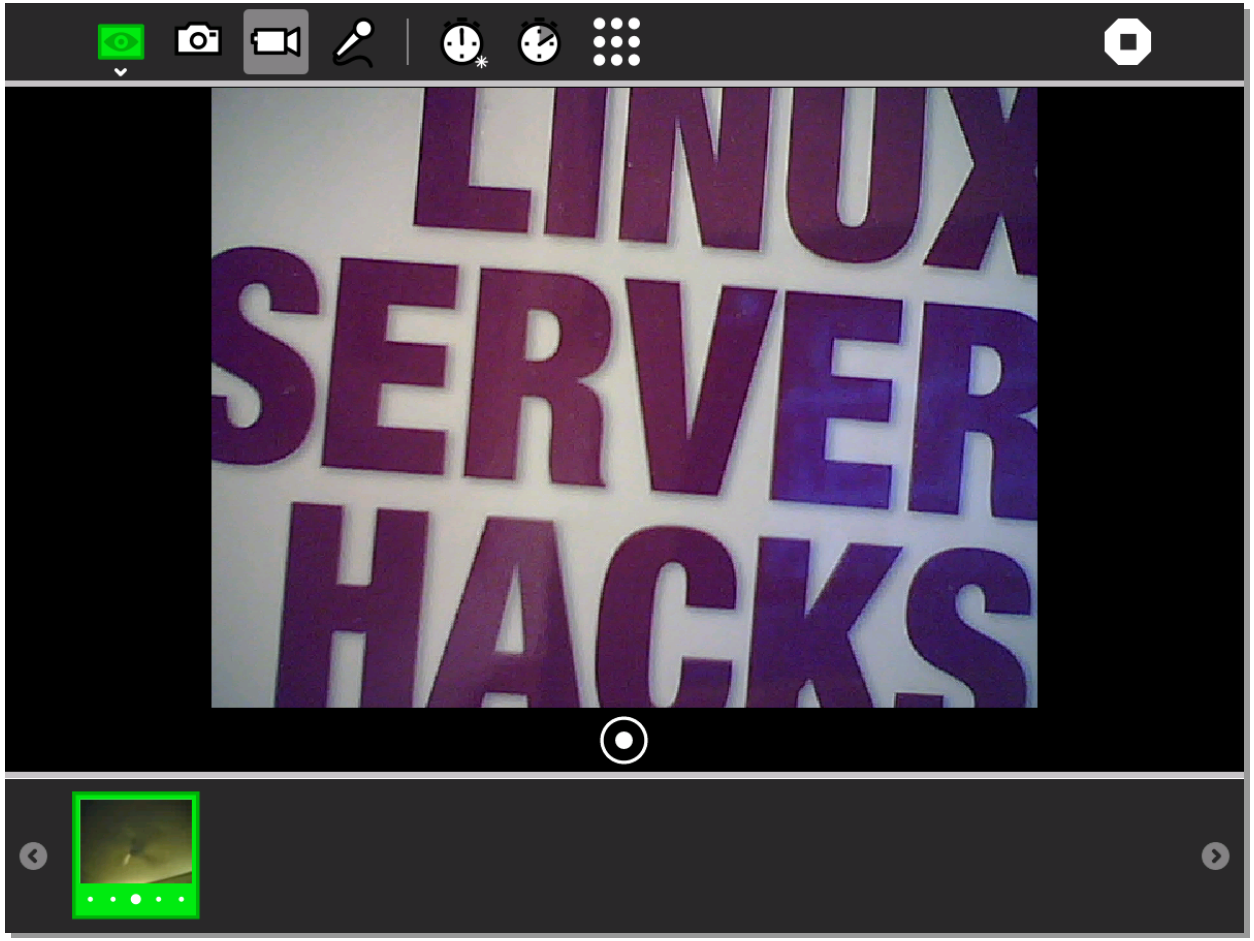


Telescope

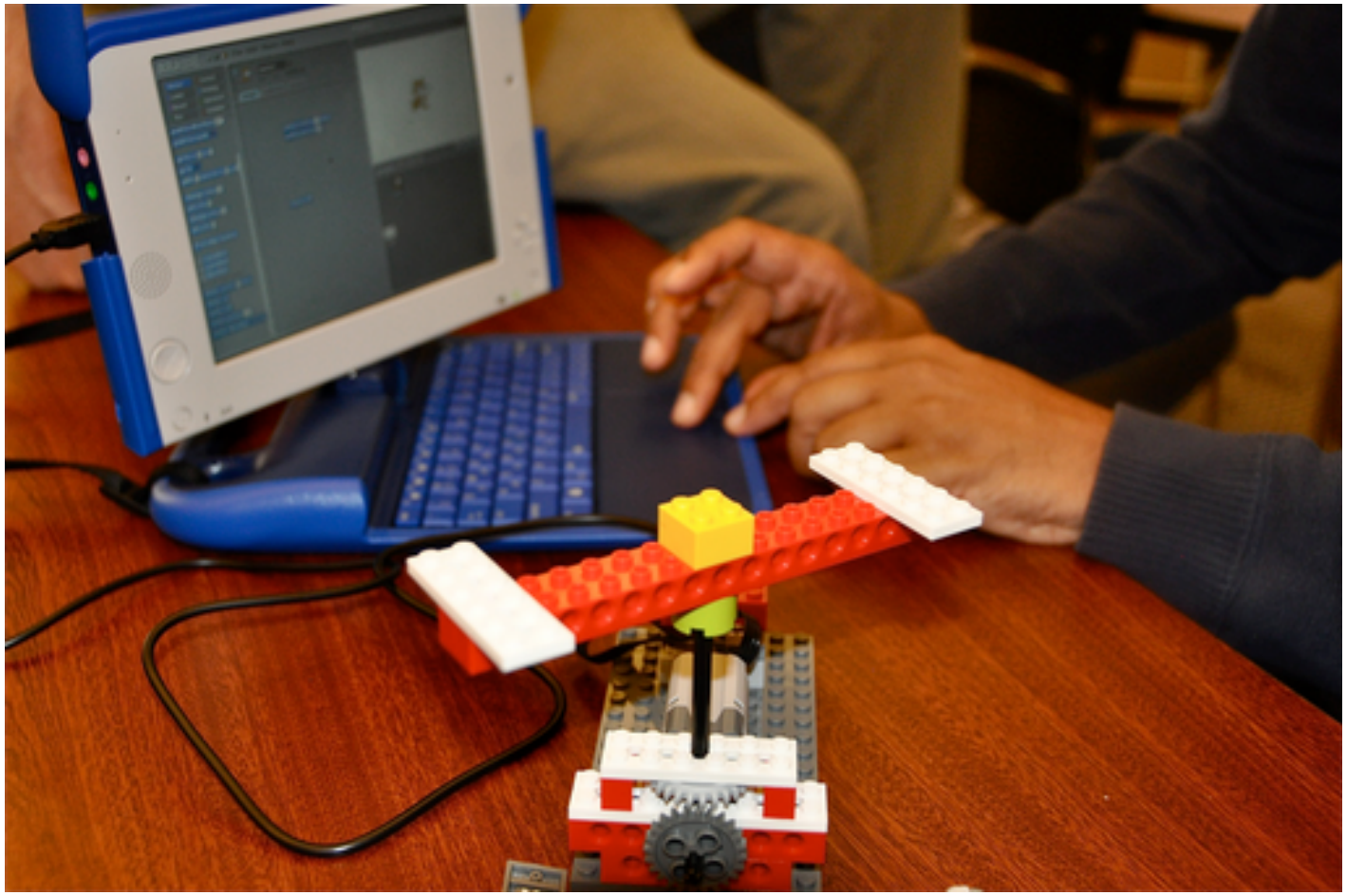
Magnifier



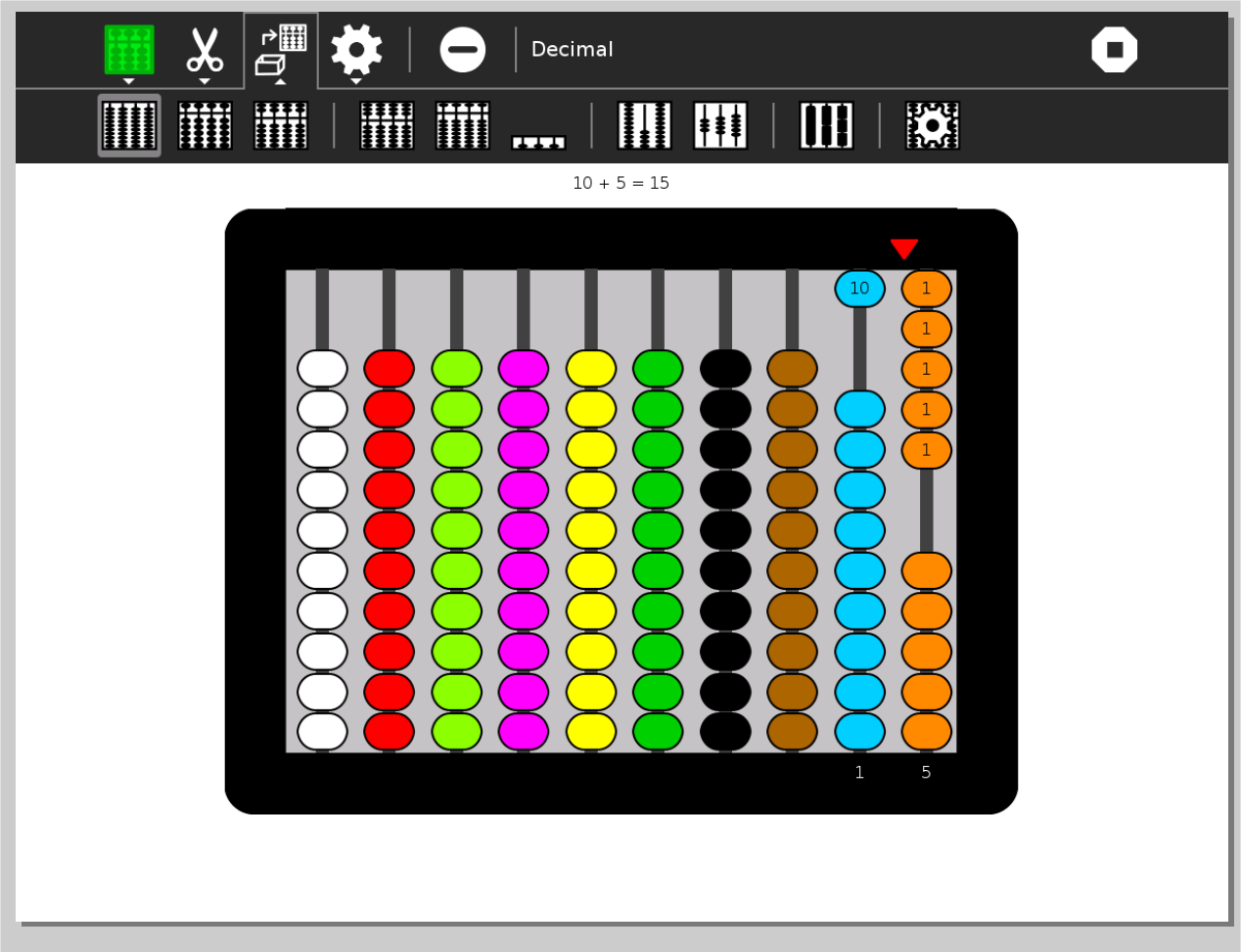
Audio, Photo, Video



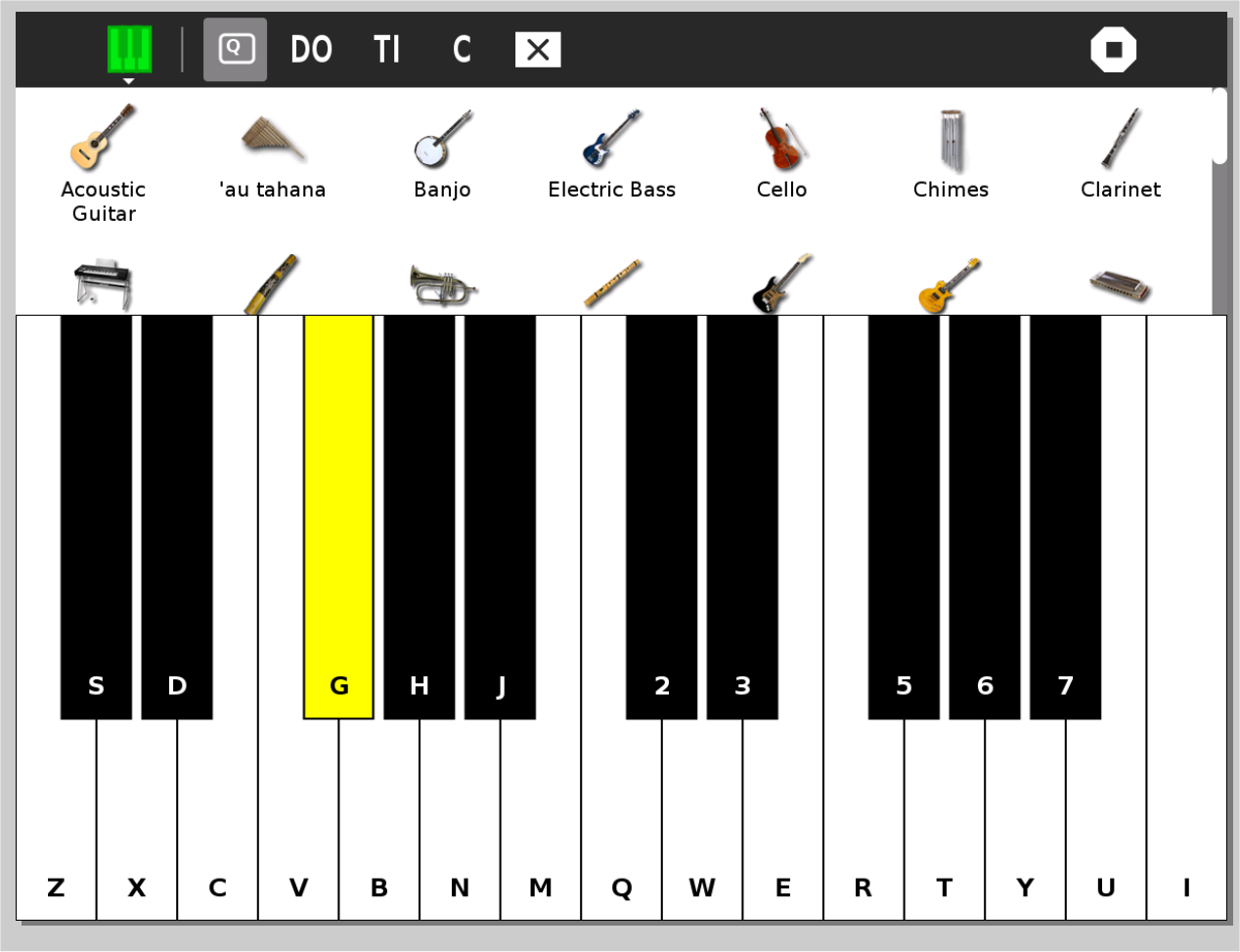
Scratch and Lego Robots



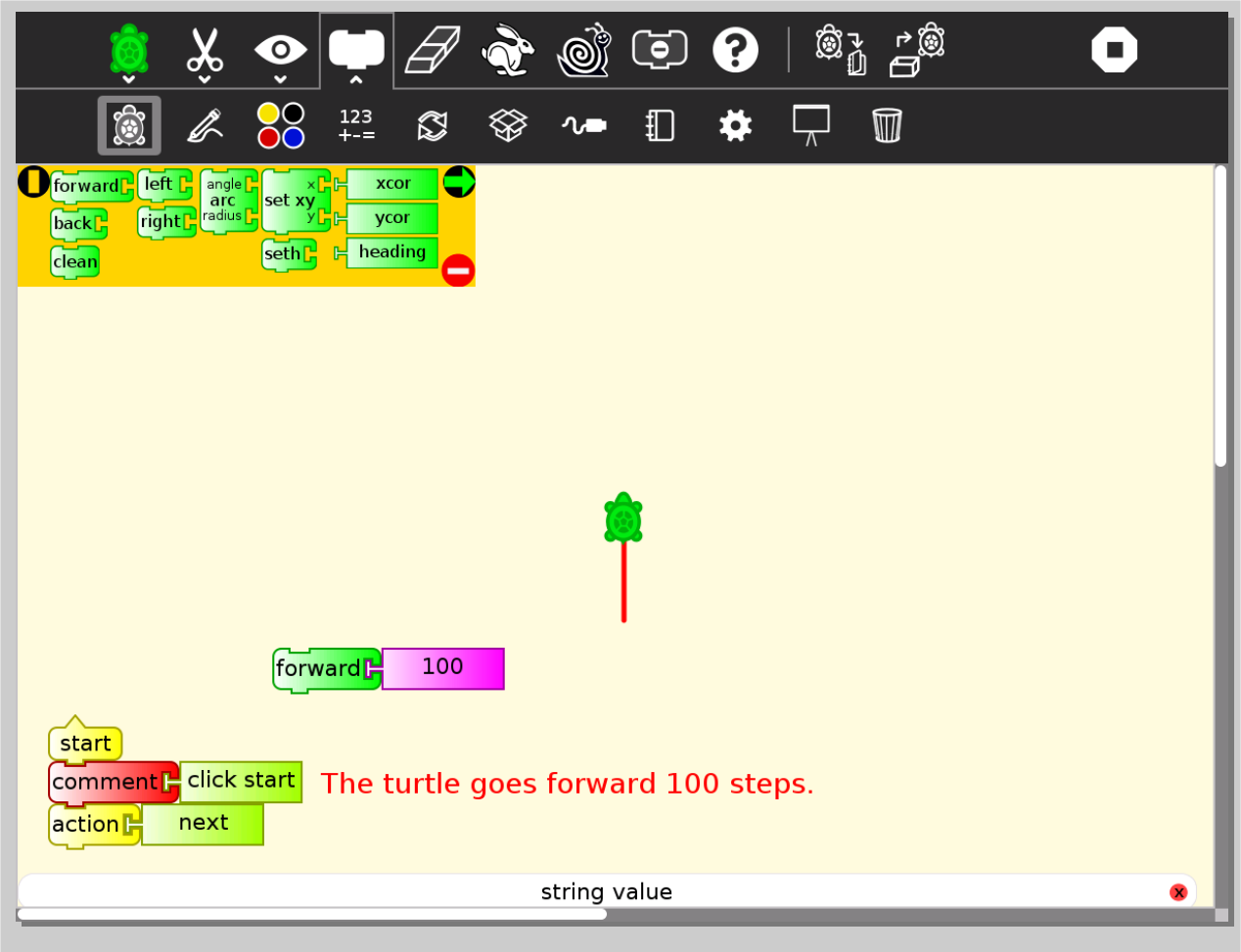
Abacus



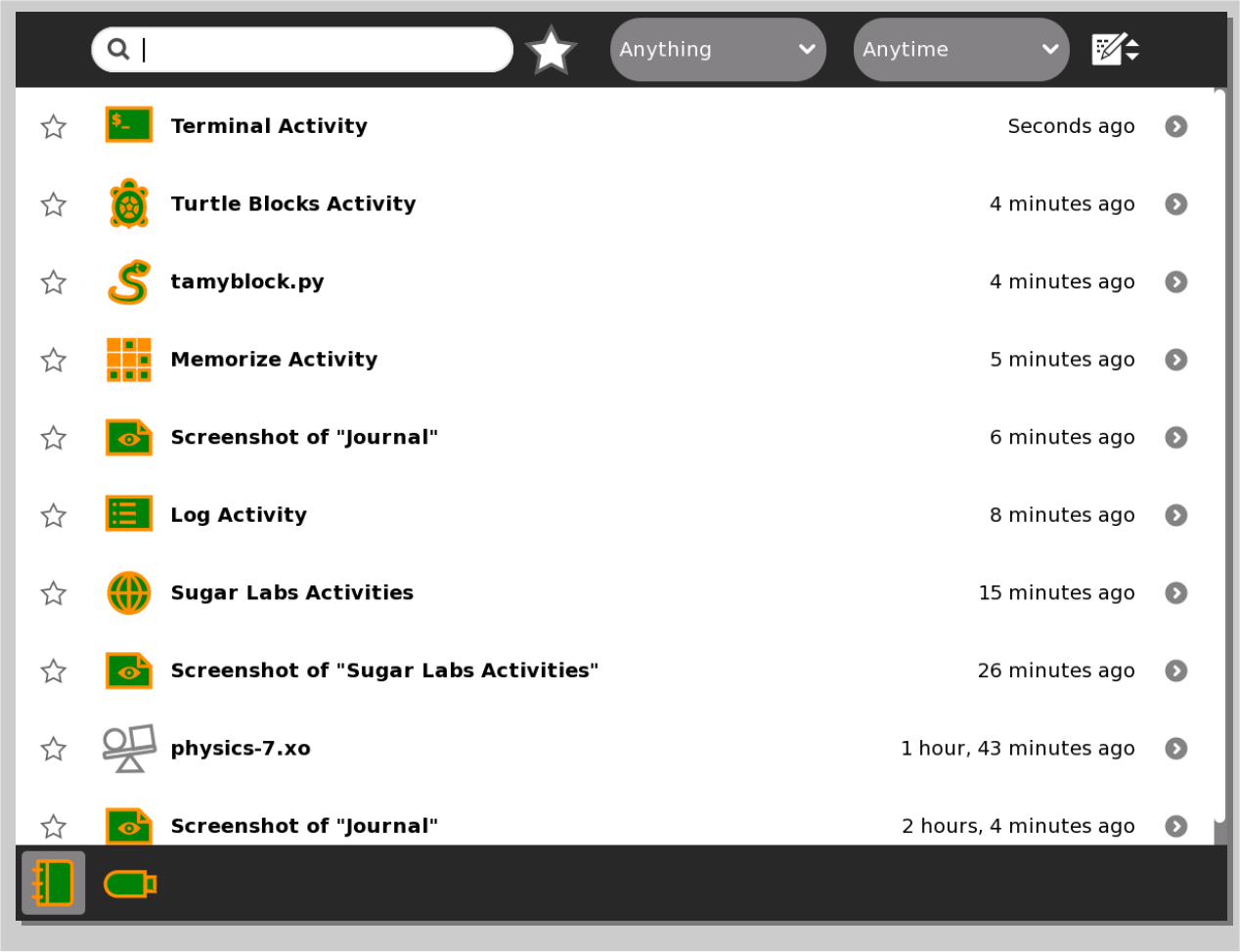
Music


DO
TI
C
Acoustic Guitar
'au tahana
Banjo
Electric Bass
Cello
Chimes
Clarinet
S
D
G
H
J
2
3
5
6
7
Z
X
C
V
B
N
M
Q
W
E
R
T
Y
U
I

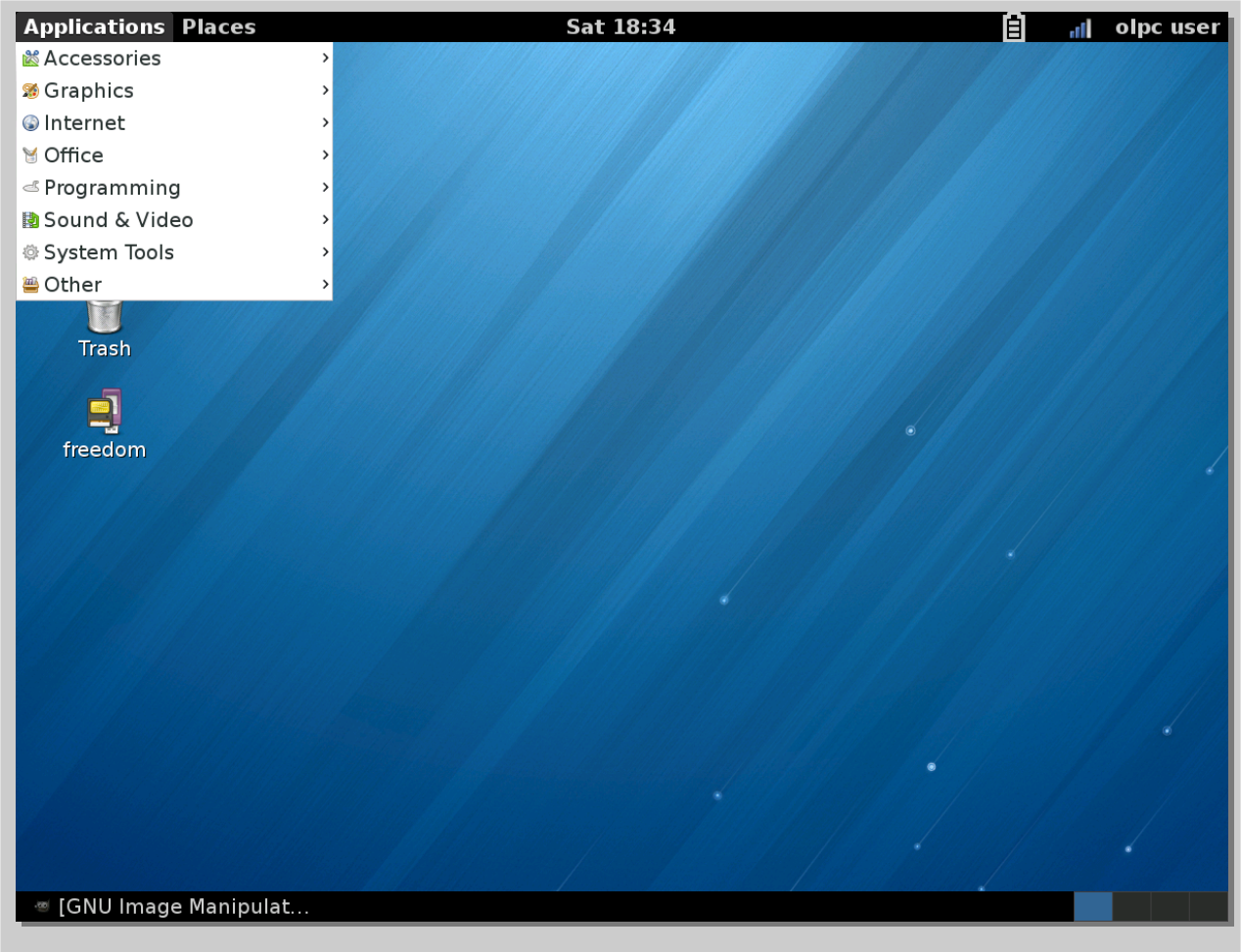
Geometry with TurtleArt



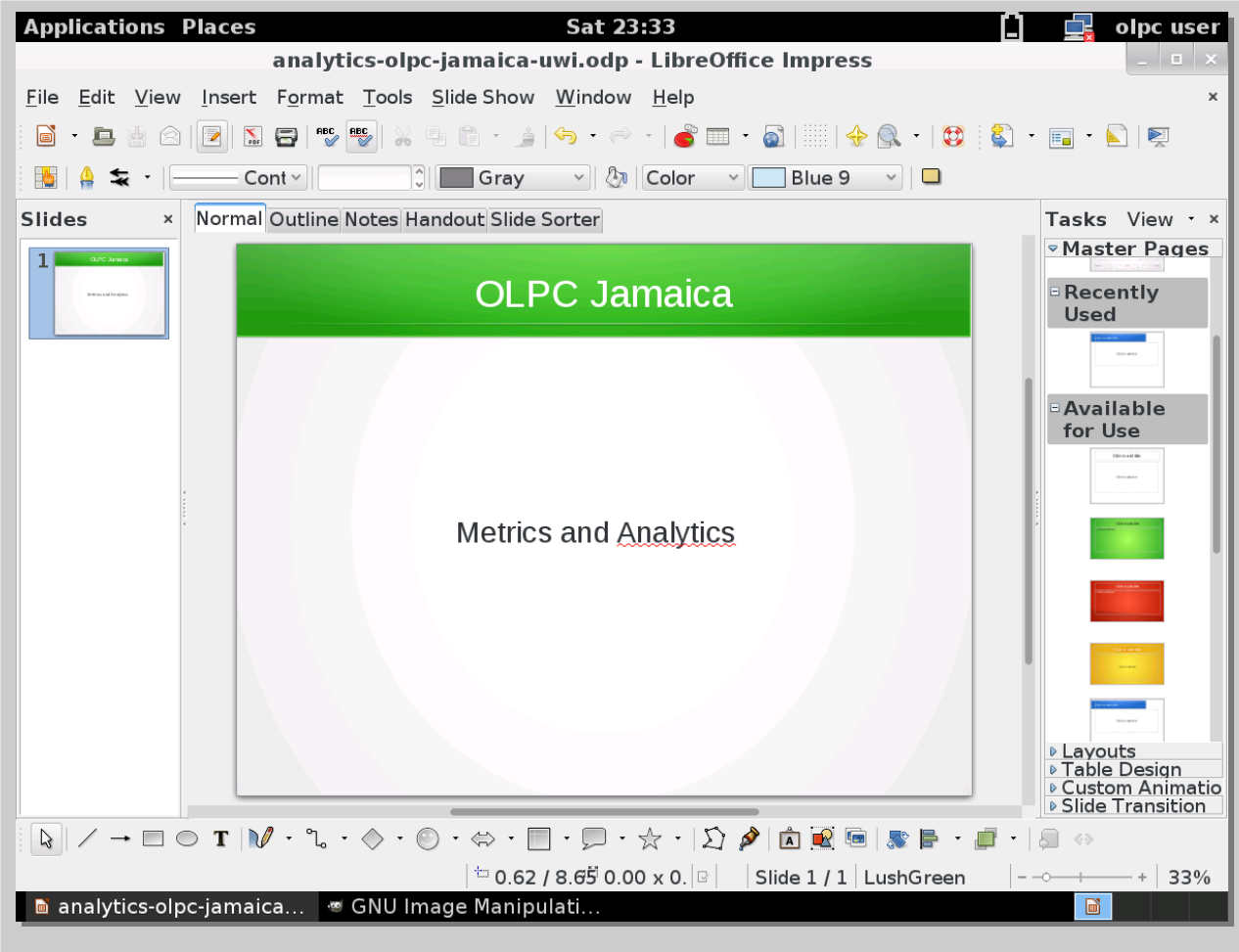
Journal


Anything
Anytime
Terminal Activity
Seconds ago
Turtle Blocks Activity
4 minutes ago
tamyblock.py
4 minutes ago
Memorize Activity
5 minutes ago
Screenshot of "Journal"
6 minutes ago
Log Activity
8 minutes ago
Sugar Labs Activities
15 minutes ago
Screenshot of "Sugar Labs Activities"
26 minutes ago
physics-7.xo
1 hour, 43 minutes ago
Screenshot of "Journal"
2 hours, 4 minutes ago

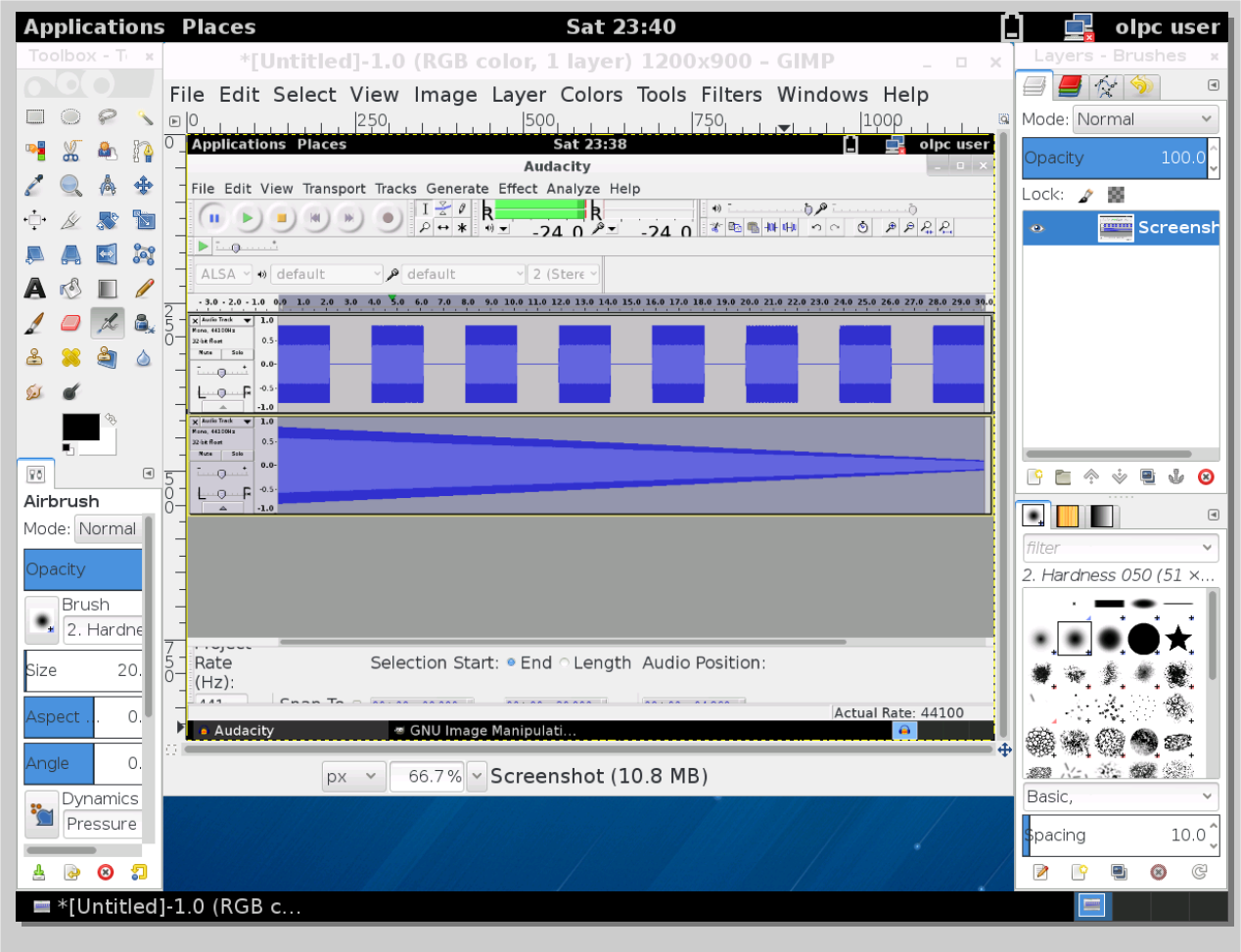
Desktop for Secondary Schools

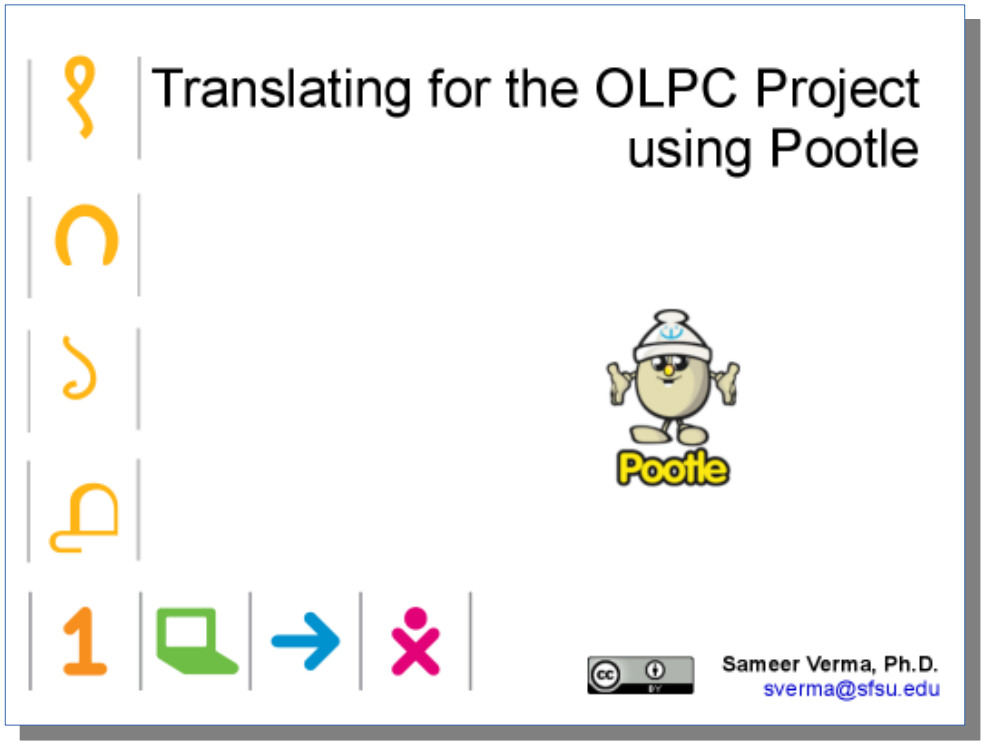


LibreOffice Productivity Suite



GIMP graphics editor





Translate:
http://translate.sugarlabs.org/

Languages

Afrikaans, Amharic, Arabic, Armenian, Aymara, Bahasa Indonesia, Bahasa Melayu, Basque, Bengali, Bengali (India), Bislama, Bulgarian, Catalan, Chinese (China), Chinese (Hong Kong), Chinese (Taiwan), Croatian, Czech, Danish, Dari, Dutch, Dzongkha, English, English (South African), English (US), Estonian, Filipino, Finnish, French, French (Canada), Friulian, Fula, Galician, Georgian, German, Greek, Gujarati, Hausa, Hebrew, Hindi, Hungarian, Icelandic, Igbo, Italian, Japanese, Kannada, Khmer, Kinyarwanda, Korean, Kreyol, Macedonian, Malayalam, Maltese, Marathi, Marovo, Mongolian, Nauruan, Nepali, Norwegian, Norwegian Bokmål, Papiamento, Papua New Guinea Pidgin (Tok Pisin), Pashto, Persian, Polish, Portuguese, Portuguese (Brazil), Punjabi, Quechua, Romanian, Russian, Serbian, Sindhi, Sinhala, Slovak, Slovenian, Solomon Islands Pidgin, Sotho, Spanish, Swahili, Swedish, Tamil, Telugu, Thai, Turkish, Ukrainian, Urdu, Uyghur, Vietnamese, Walloon, Wolof, Yoruba

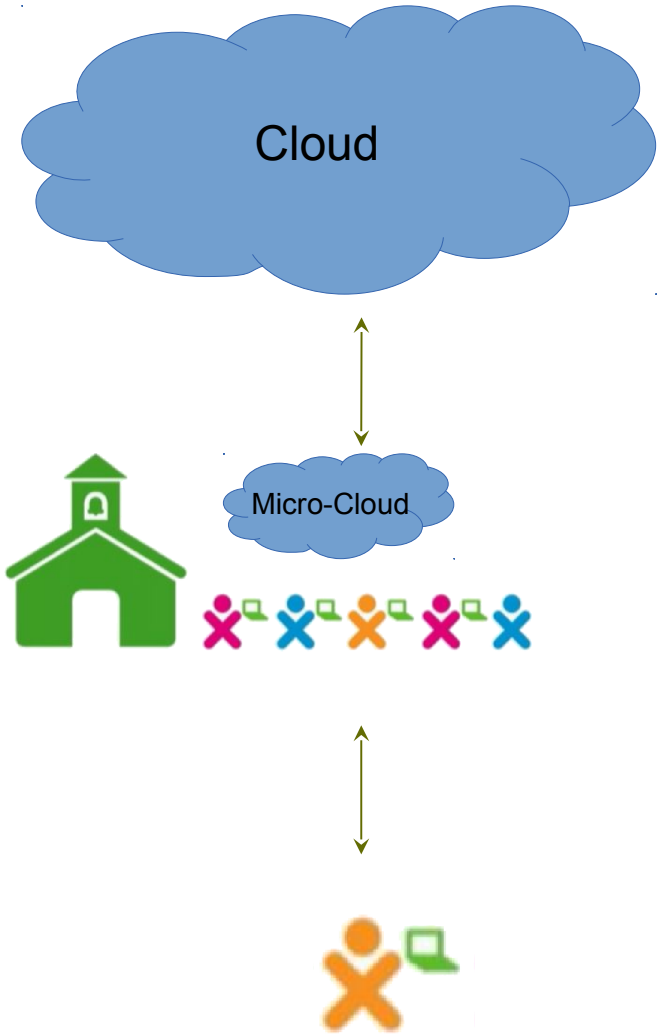
Approx. 100+ languages

Architecture beyond the XO

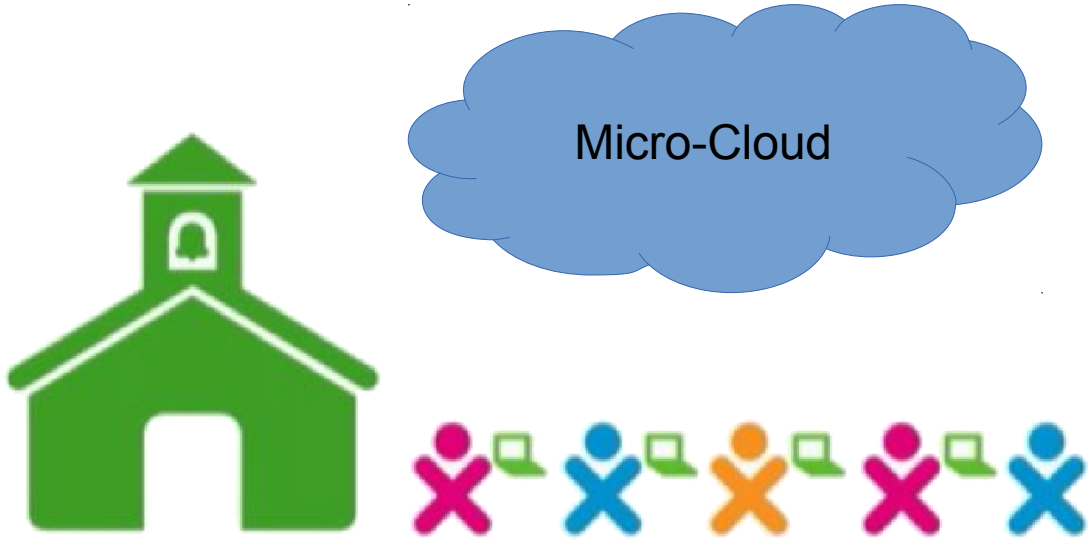
Central management for orchestration, monitoring and analytics is done in the cloud.

Micro-cloud appliance at school acts as a local mirror for content and management

Laptop with child has some offline content. It works in school and can go home.



Micro Cloud Appliance at the School



Micro-cloud appliance at school acts as a local mirror for content and management. Several services such as backup/restore, caching, filtering, traffic management, and data metrics run seamlessly at the school.

The appliance is a plug-and-play device. It can handle intermittent connectivity.

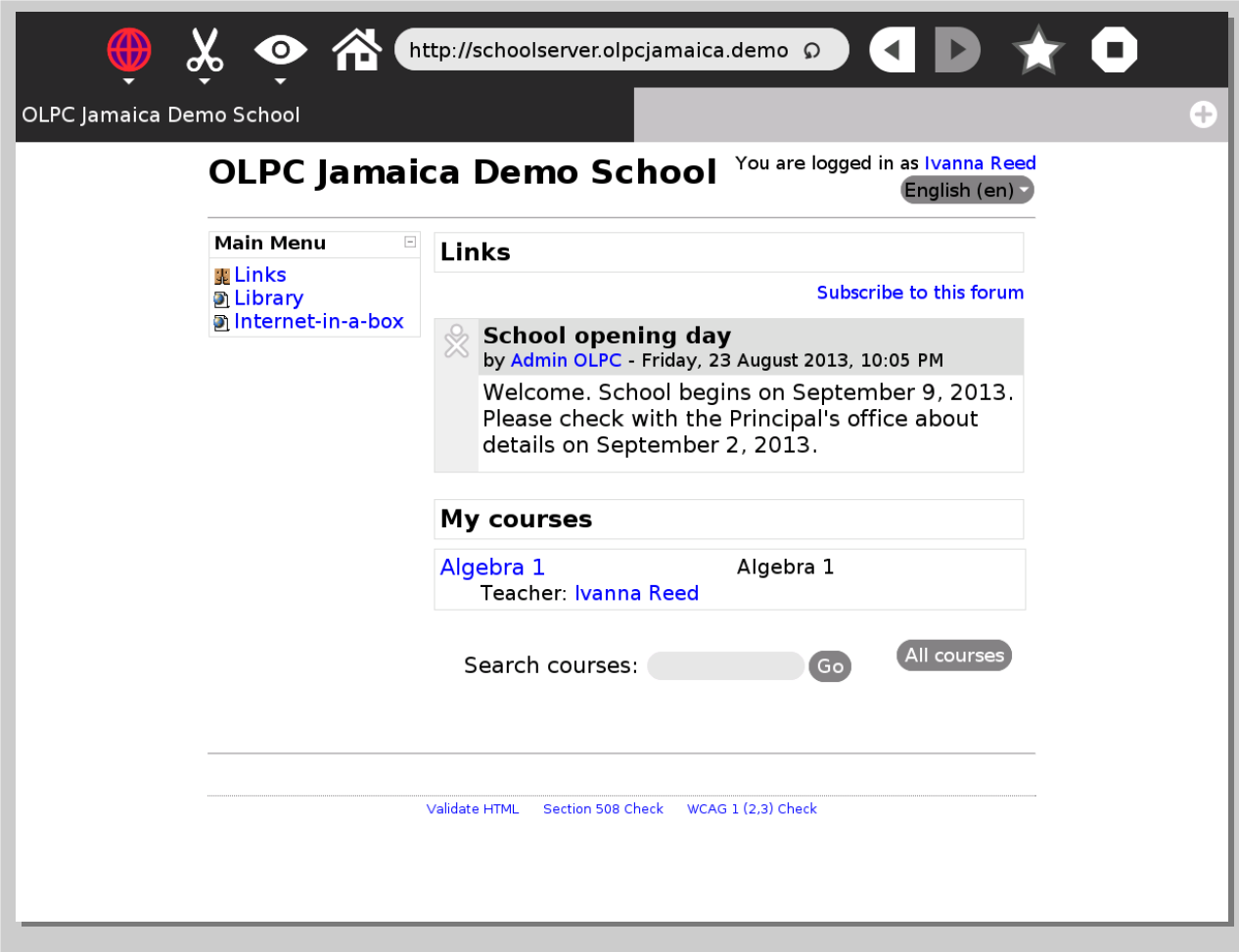
Appliance?

FitPC

Jetway JBC372F36W-S

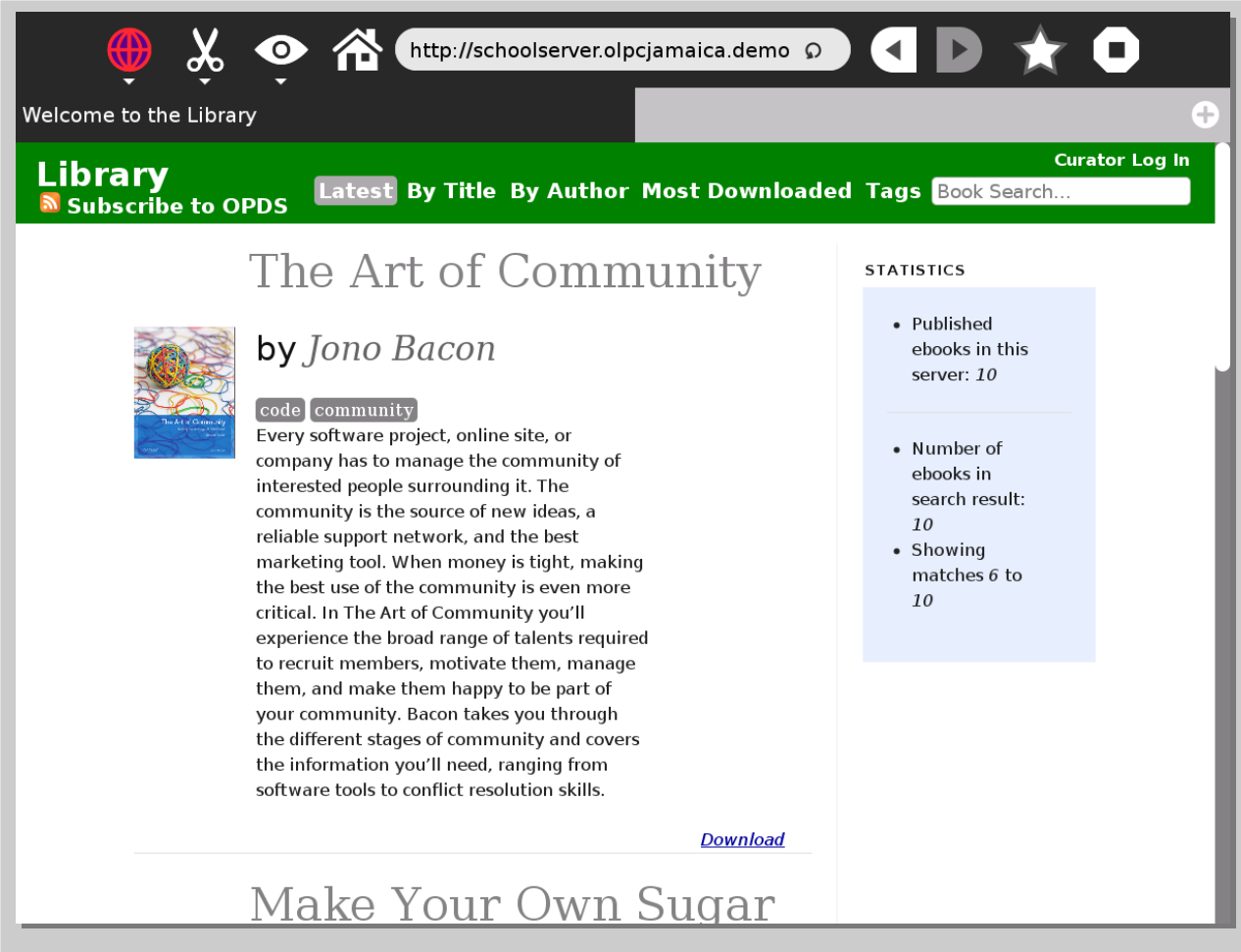
XO 1.75 in a briefcase!

Learning Management System



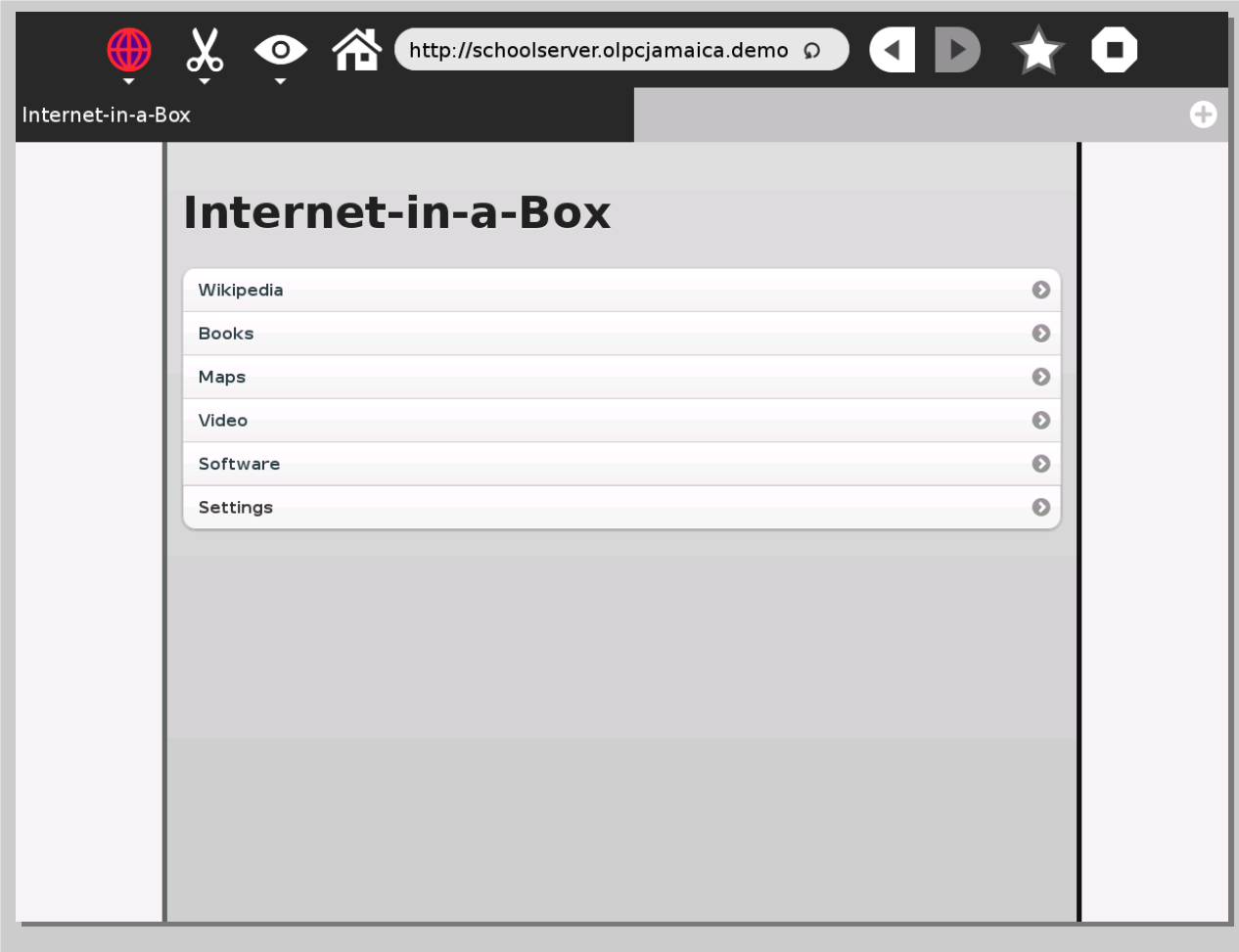
Based on Moodle (http://moodle.org/).
Runs at the micro-cloud at school and serves content even when offline.

Digital library



Based on Pathagar (https://github.com/PathagarBooks/pathagar).
Runs at the micro-cloud at school and serves ebooks even when offline.

Internet-in-a-Box

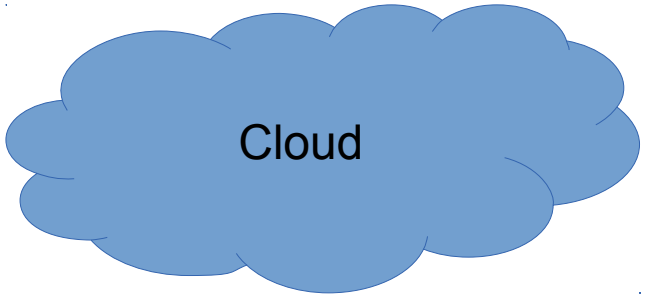


Runs at the micro-cloud at school and serves Wikipedia, Maps, Khan Academy videos even when offline.

Monitoring, Orchestration and Analytics

Three levels of management

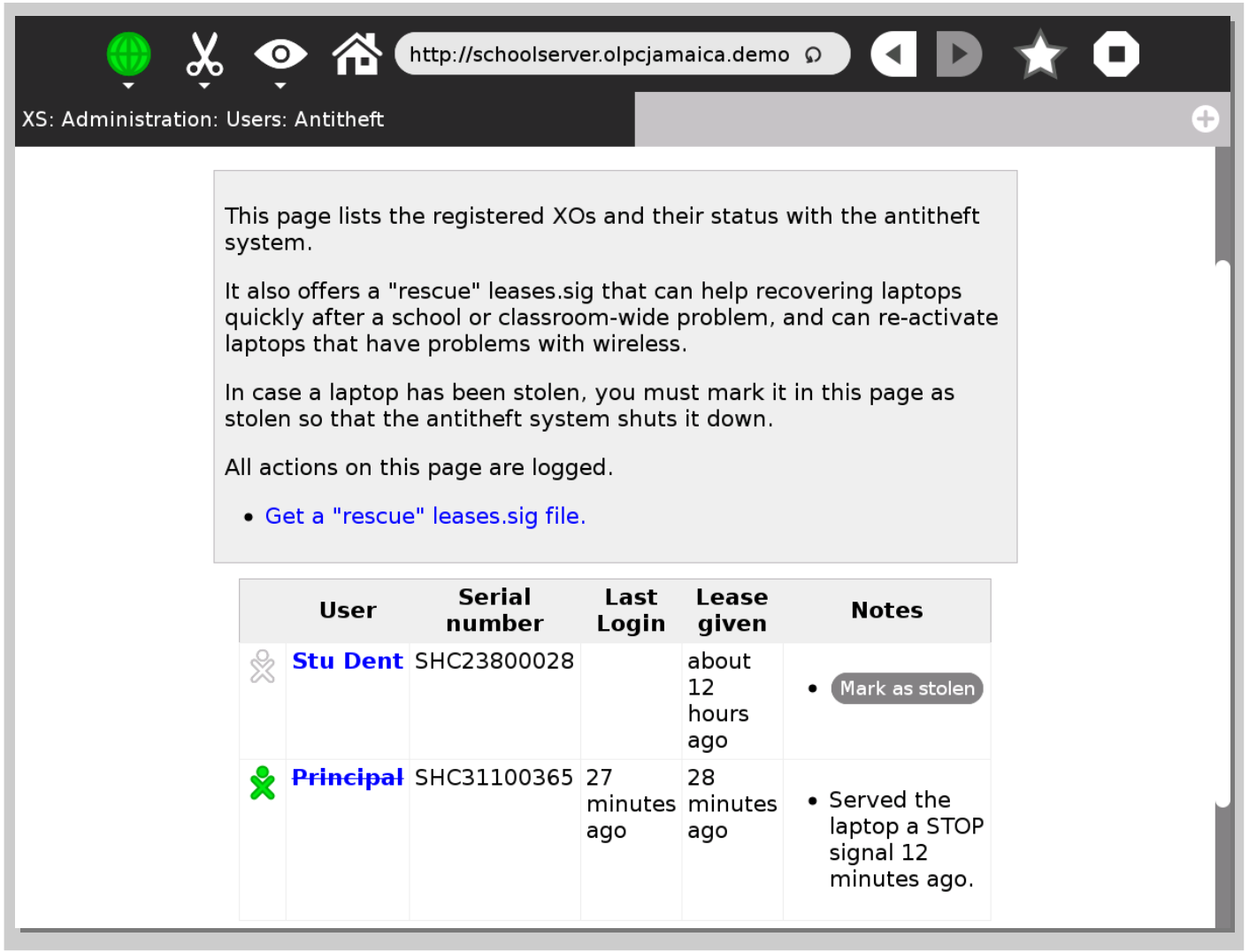
Cloud
(central management)



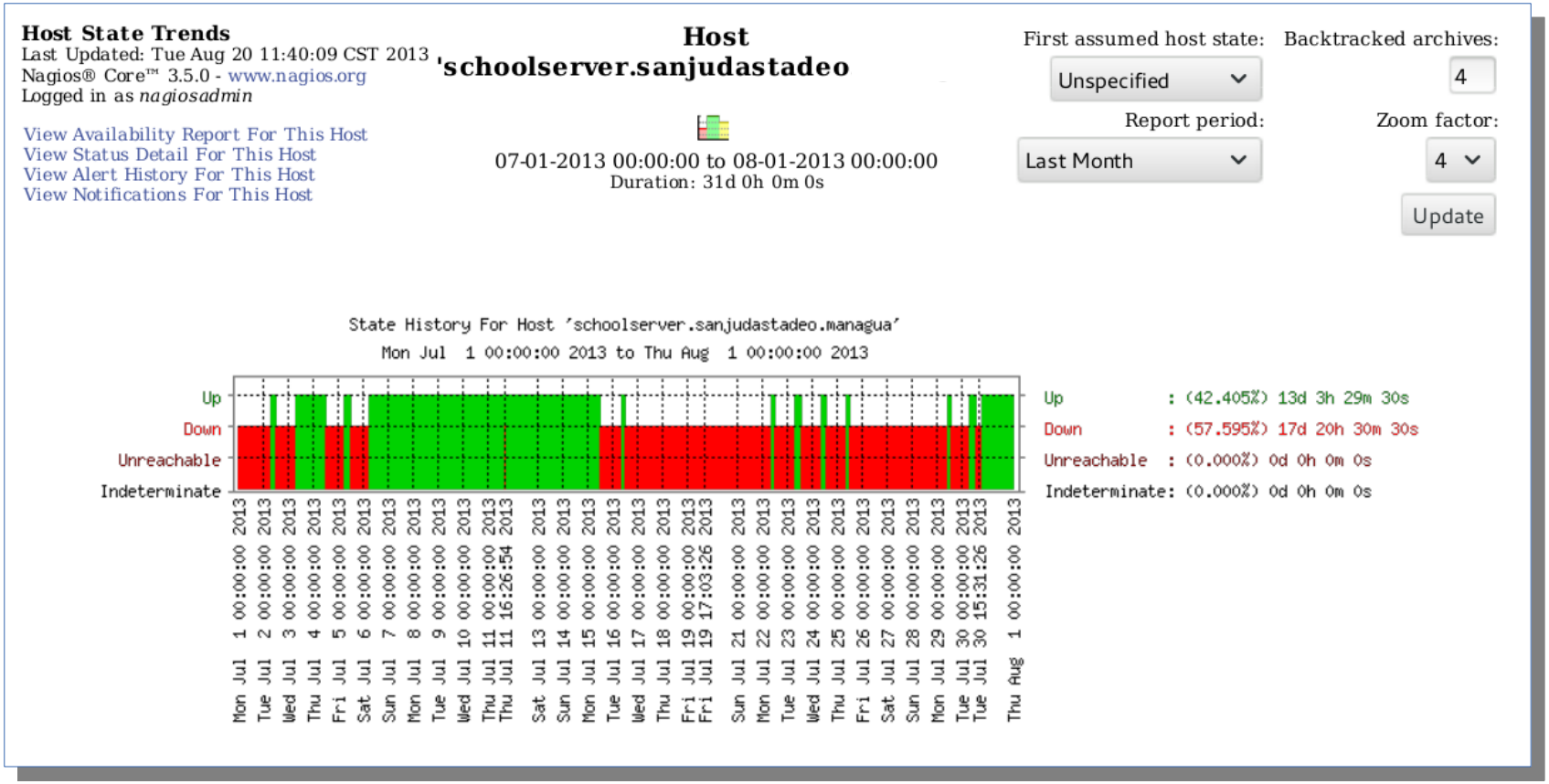
At School
(micro-cloud appliance)

With the Child
(Journal)

Theft Deterrence



Monitoring


Host State Trends
Last Updated: Tue Aug 20 11:40:09 CST 2013
Nagios® Core™ 3.5.0 - www.nagios.org
Logged in as nagiosadmin
View Availability Report For This Host
View Status Detail For This Host
View Alert History For This Host
View Notifications For This Host
Host
'schoolserver.sanjudastadeo
07-01-2013 00:00:00 to 08-01-2013 00:00:00
Duration: 31d 0h 0m 0s
First assumed host state:
Unspecified
Backtracked archives:
4
Report period:
Last Month
Zoom factor:
4
Update
State History For Host 'schoolserver.sanjudastadeo.managua'
Mon Jul 1 00:00:00 2013 to Thu Aug 1 00:00:00 2013
Up
Down
Unreachable
Indeterminate
Up : (42.405%) 13d 3h 29m 30s
Down : (57.595%) 17d 20h 30m 30s
Unreachable : (0.000%) 0d 0h 0m 0s
Indeterminate: (0.000%) 0d 0h 0m 0s

School micro-cloud orchestration

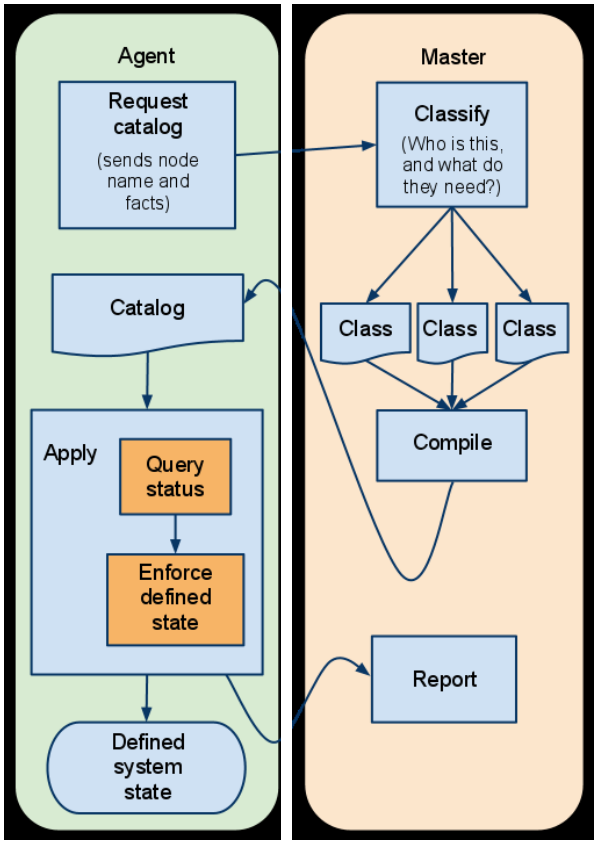
Each school appliance is provisioned and managed by a central service running on Puppet

Puppetlabs, Inc.
http://puppetlabs.com/

- Server automation tool.

- Express system configuration.

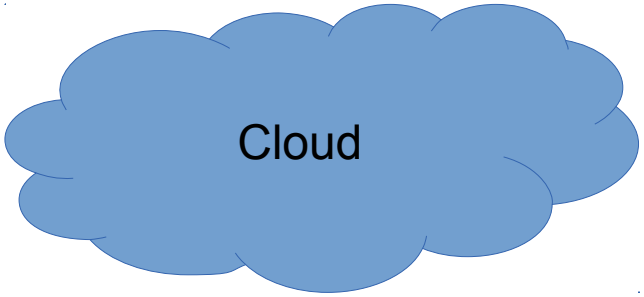
- Client and server distributed model.



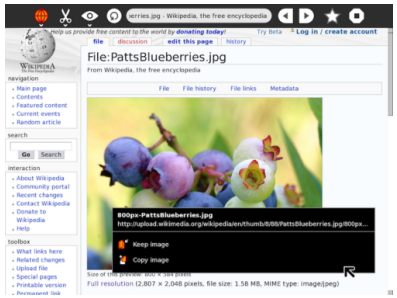
At School Cloud

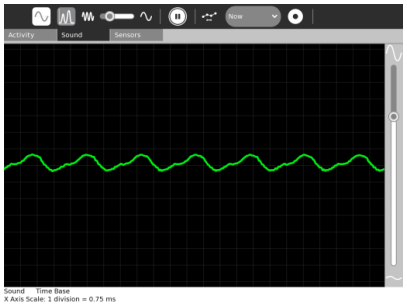
Cloud-based Usage Analytics Dashboard

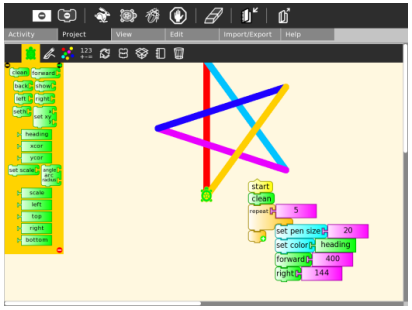
(being developed at University of the West Indies, Jamaica)

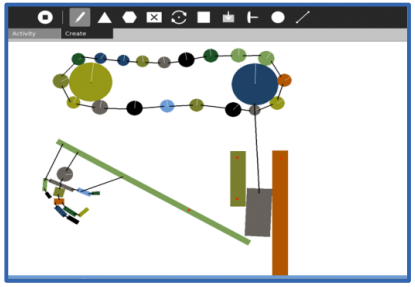


What happens at each school?

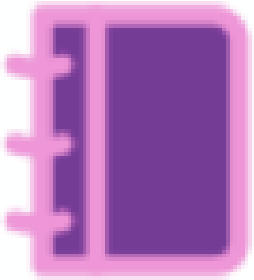




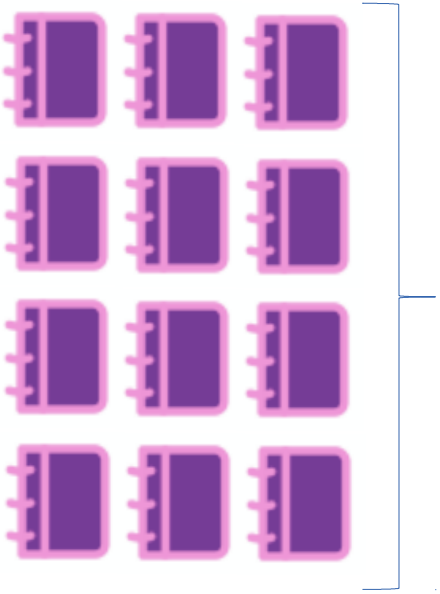


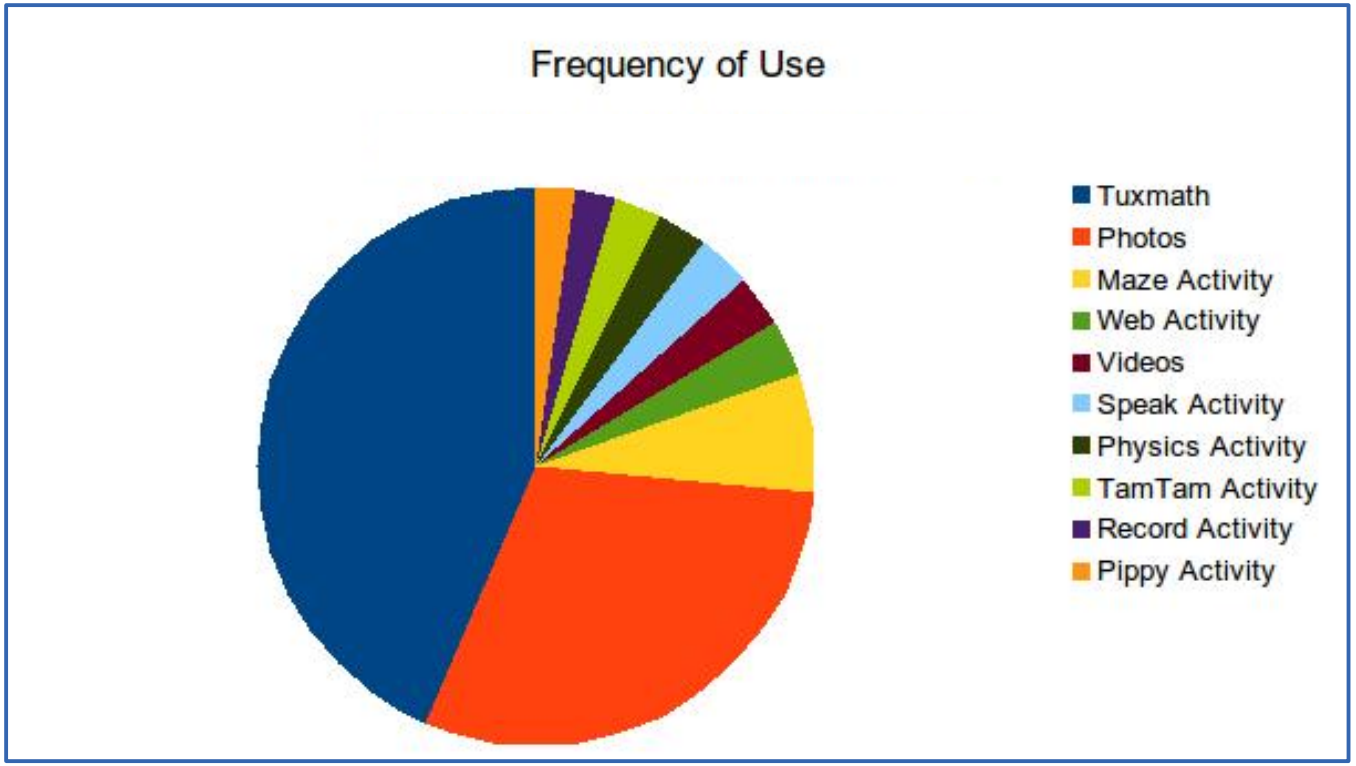


Each child's work is automatically stored in a Journal on her laptop

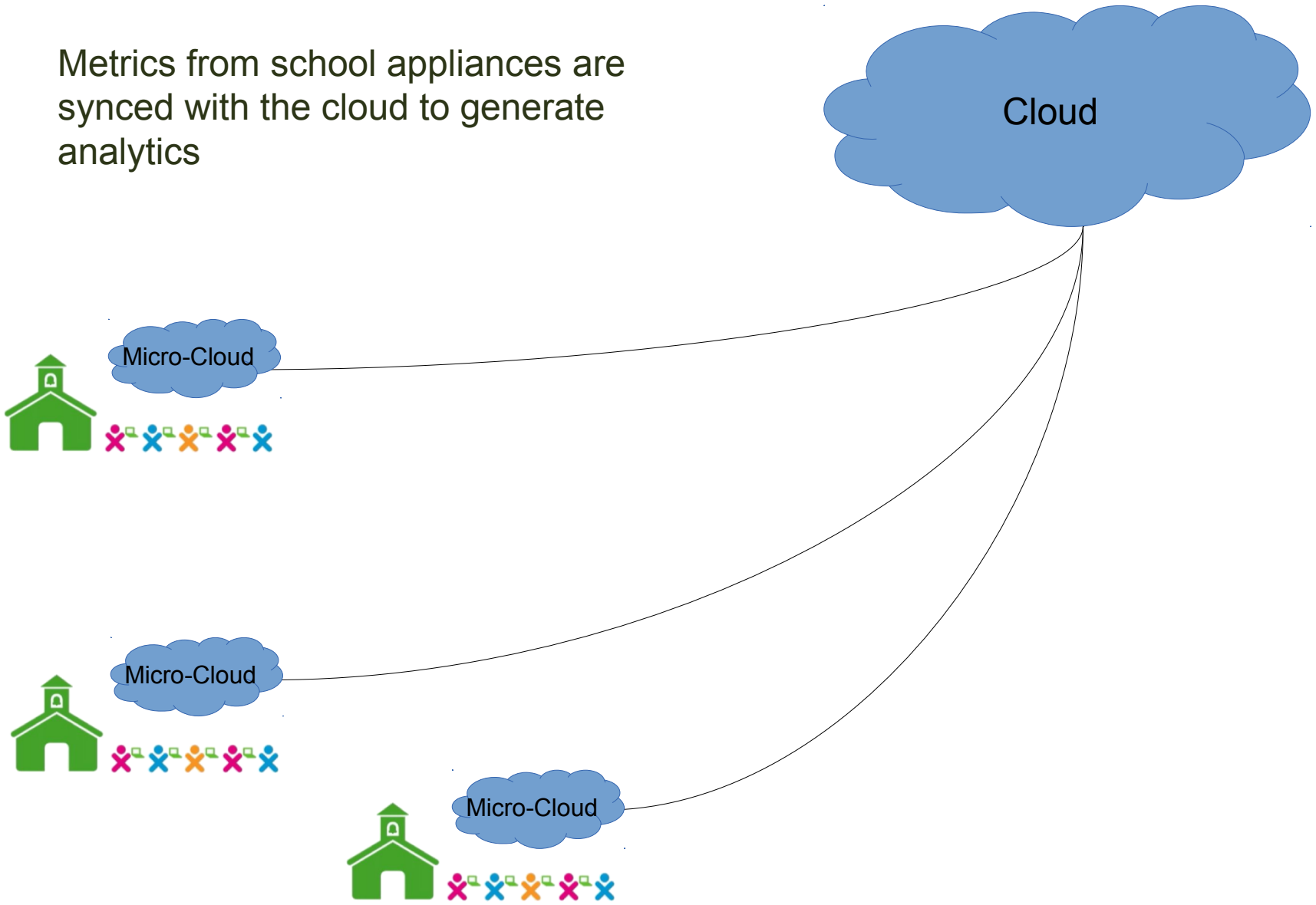


This work is distilled into metrics at the school micro-cloud appliance

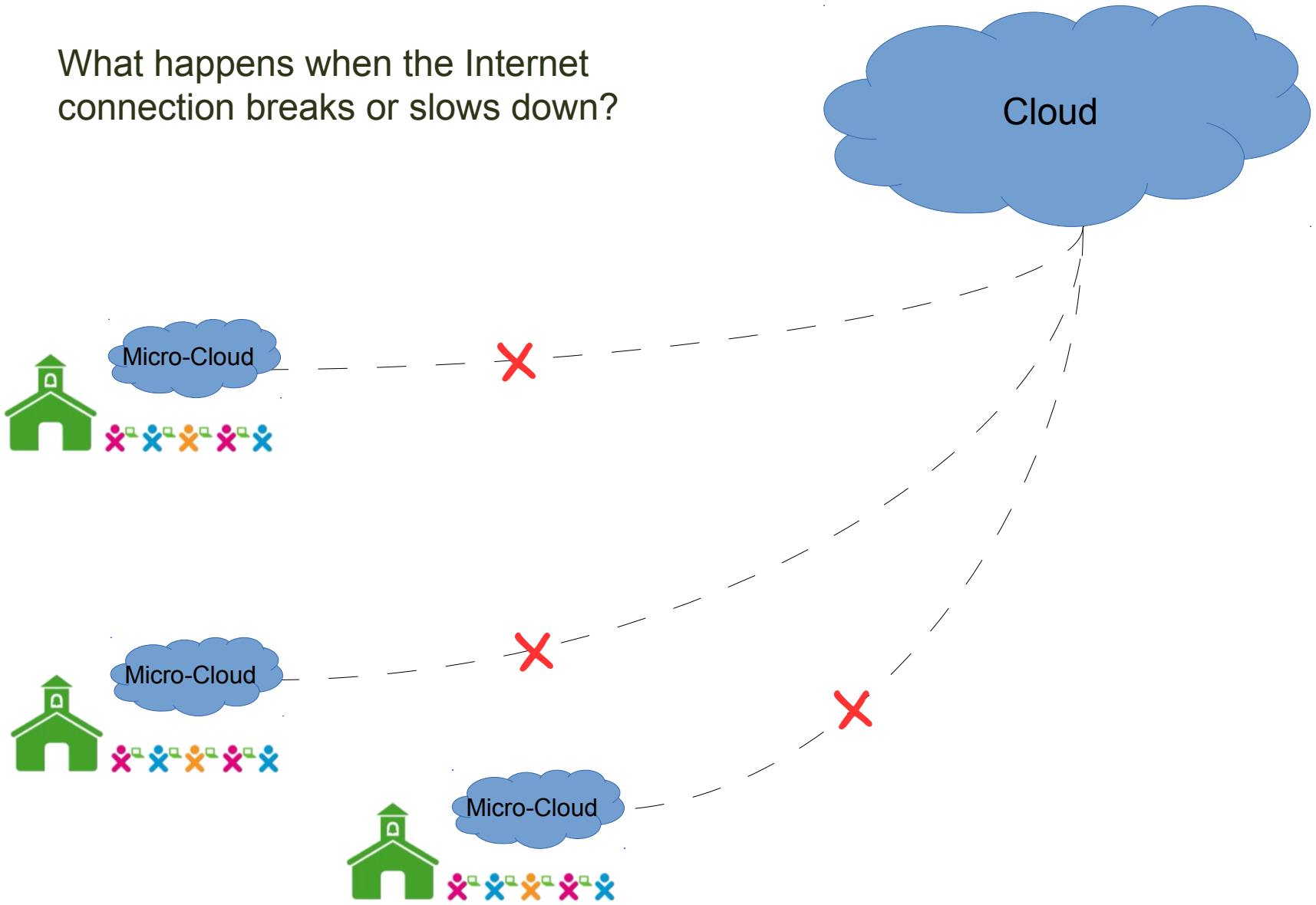




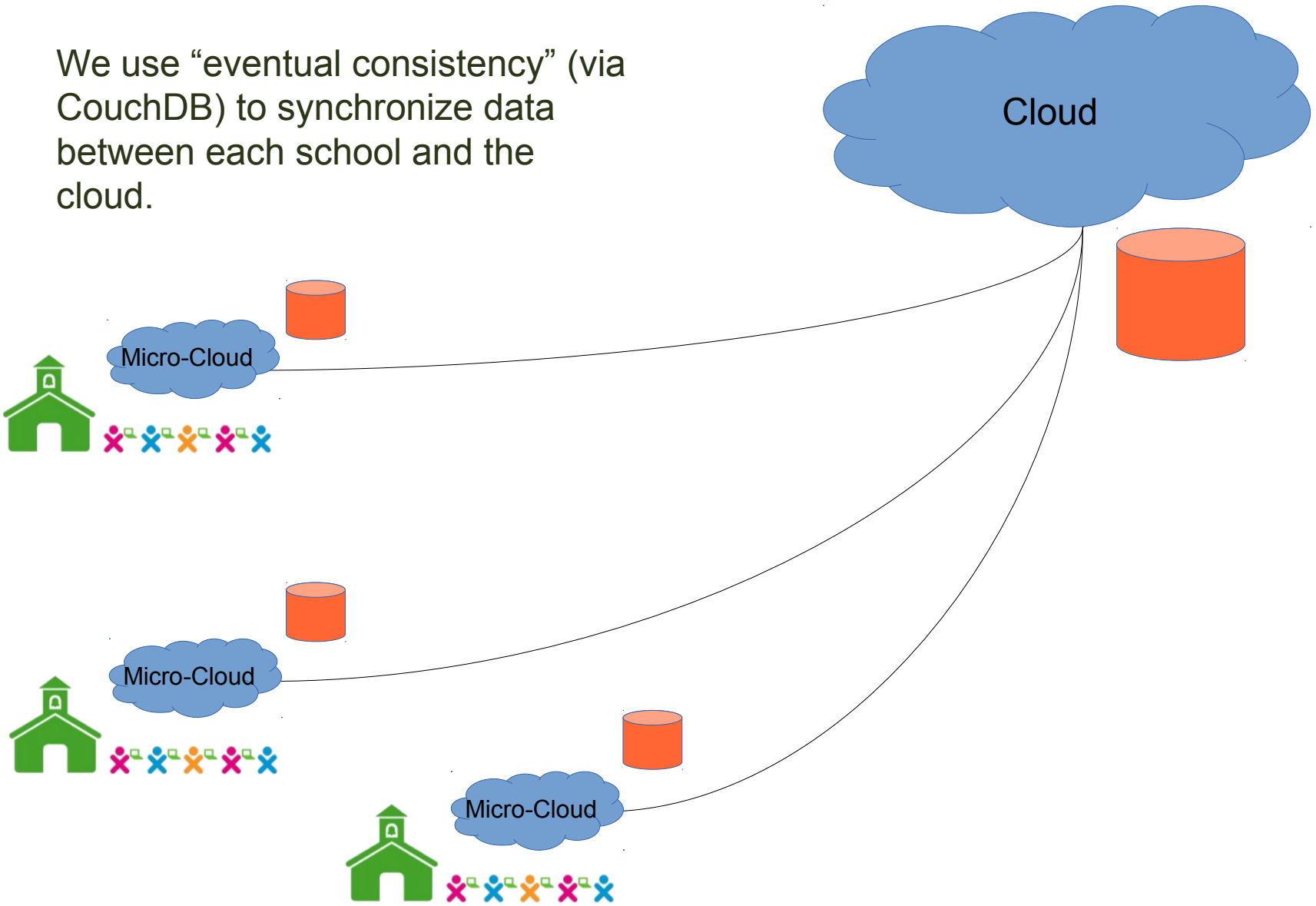
Metrics from school appliances are synced with the cloud to generate analytics



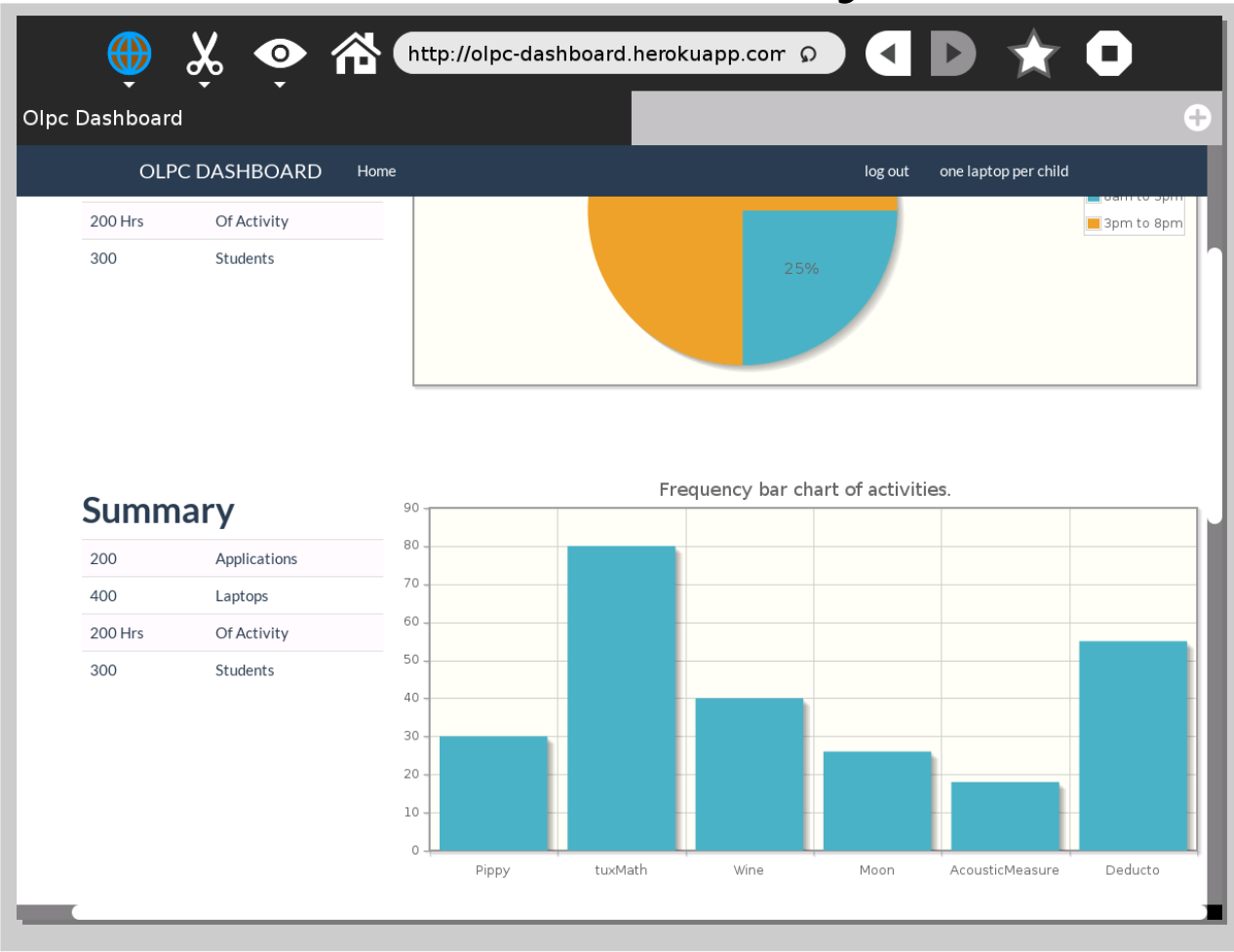
What happens when the Internet connection breaks or slows down?



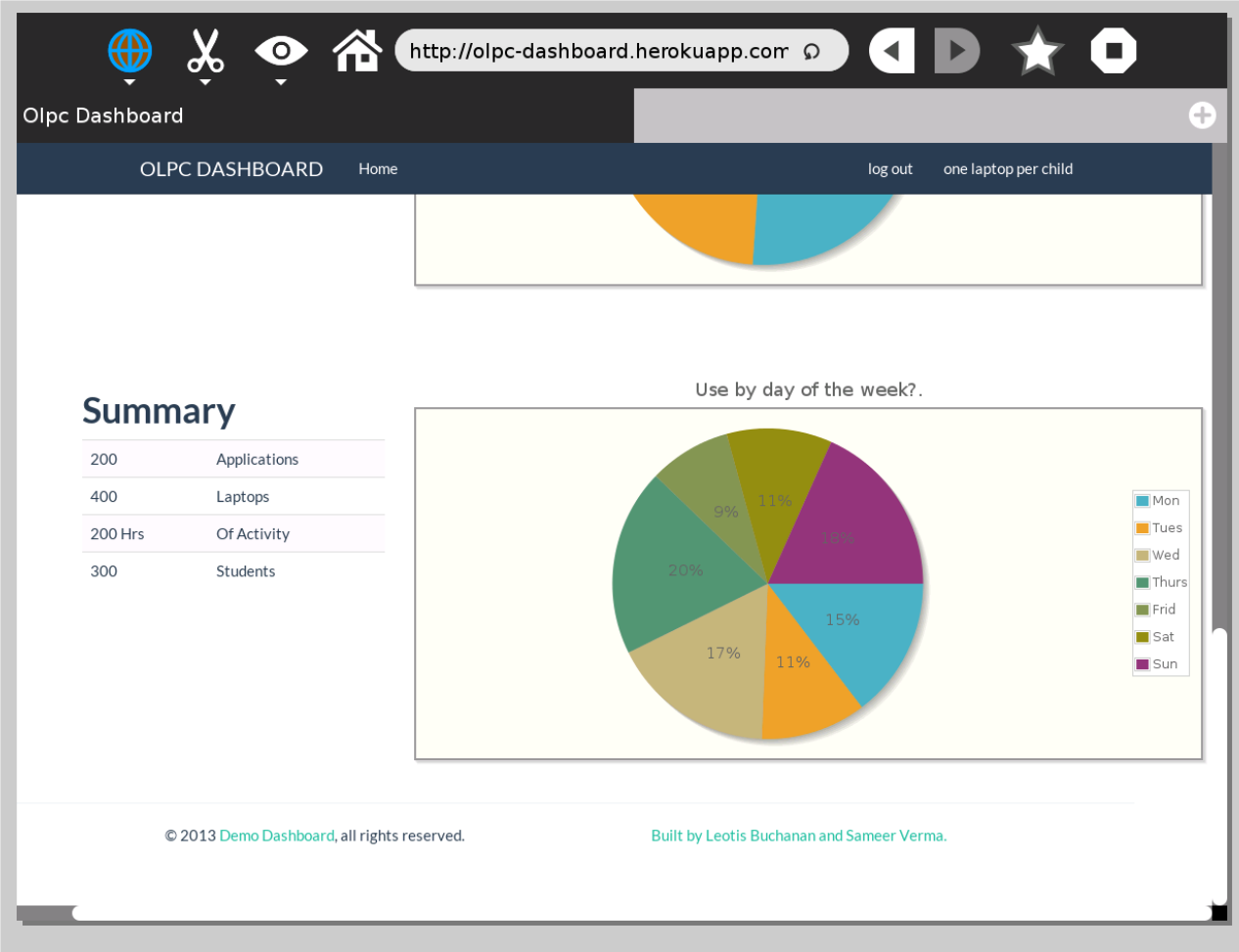
We use “eventual consistency” (via CouchDB) to synchronize data between each school and the cloud.



Analytics – Usage Frequency and Time of Day



Analytics – Usage by Day of the Week



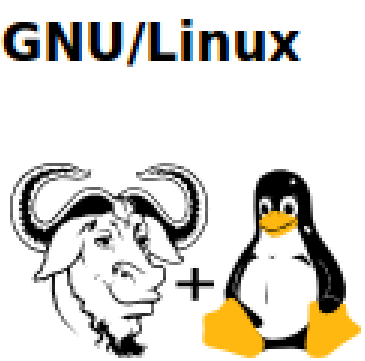
Beyond OLPC

sugarlabs

http://sugarlabs.org/

Sugar on Linux Distributions

- Sweets for Ubuntu:
  - http://wiki.sugarlabs.org/go/Sweets_Distribution
- Debian:
  - http://wiki.sugarlabs.org/go/Debian
- Fedora:
  - http://wiki.sugarlabs.org/go/Fedora
- Linux Mint:
  - http://wiki.sugarlabs.org/go/Linux_Mint



VirtualBox

http://wiki.sugarlabs.org/go/Sugar_Creation_Kit/VirtualBox

Sugar on a Stick

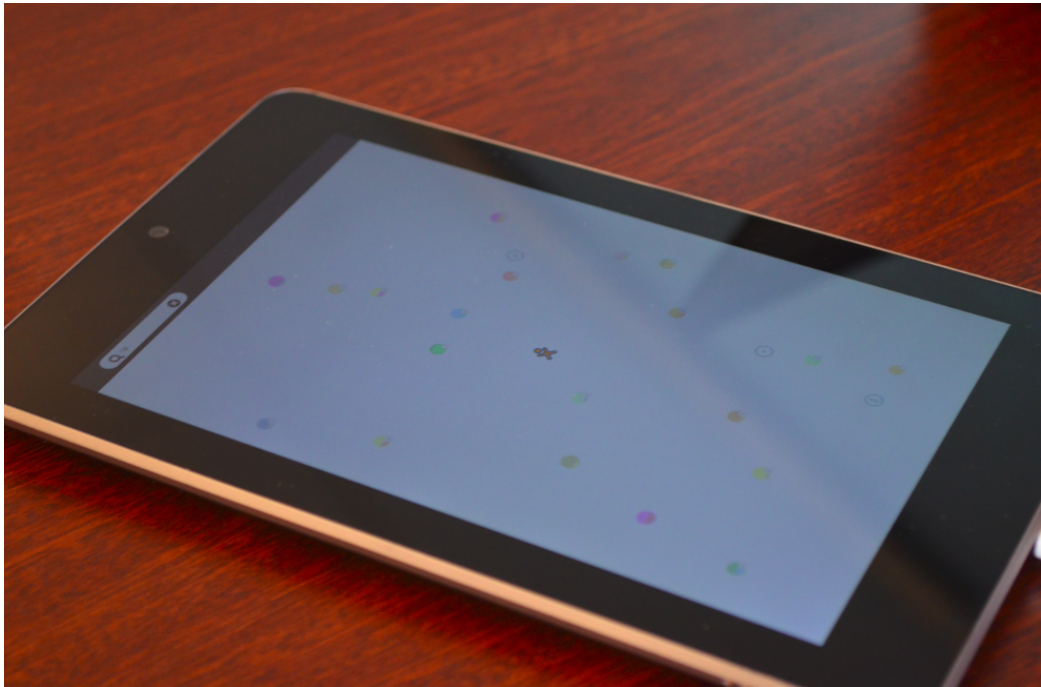
http://wiki.sugarlabs.org/go/Sugar_on_a_Stick/Downloads

Sugar on Raspberry Pi

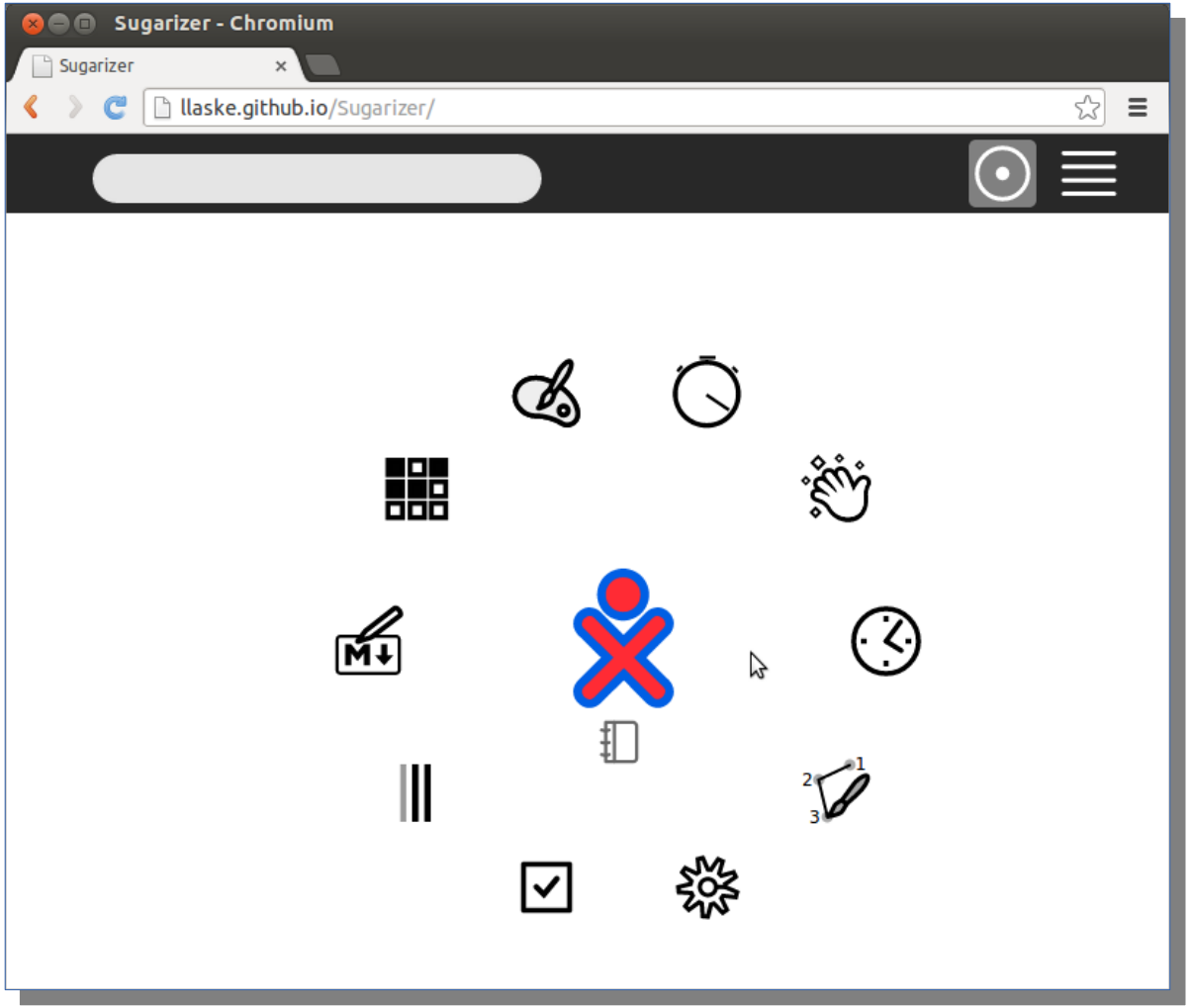
http://wiki.sugarlabs.org/go/Sugar_Creation_Kit/sck/Advanced_Topics#Pidora

Sugar on tablets

- Tricky!
- Sugar on Ubuntu Desktop (not Ubuntu Touch) for ARM running on a Nexus 7.
- X-org and GTK dependencies.
- Android?



Sugar on the Web



http://sugarizer.org Works better in Chrome.
GitHub: https://github.com/llaske/Sugarizer

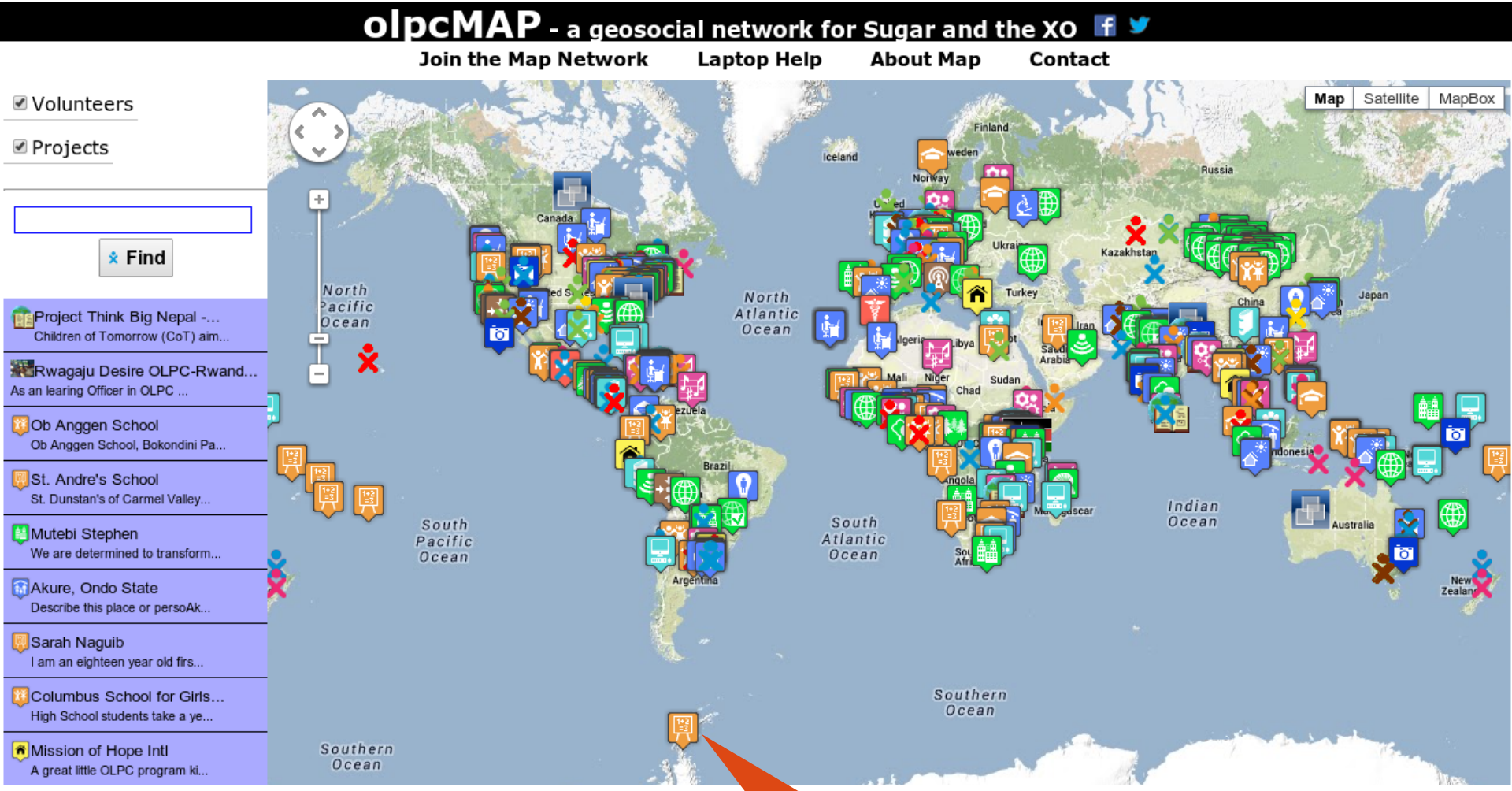
Apps Co-exist

- Sugar shell
- Activities in Python
- Activities in HTML5 + JavaScript + CSS

```
<!DOCTYPE html>
<html>

  <head>
    <meta charset="utf-8" />
    <title>Sugarizer</title>

        <!-- Sugar Framework -->
    <link rel="stylesheet" href="lib/sugar-web/graphics/css/sugar.css">
    <link rel="stylesheet" href="css/activity.css">
    <script data-main="js/loader" src="lib/require.js"></script>

        <!-- Enyo Framework -->
        <link href="lib/enyo/enyo.css" rel="stylesheet" type="text/css" />
        <link href="lib/enyo/lib/layout/layout.css" rel="stylesheet" type="text/css" />
```

Volunteers and Projects

Find one in your neighborhood.http://olpcmap.net



Imagine.