

Sugar: The sweet constructionist learning environment

>>> PyCon India '10

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Hola!

A little history...

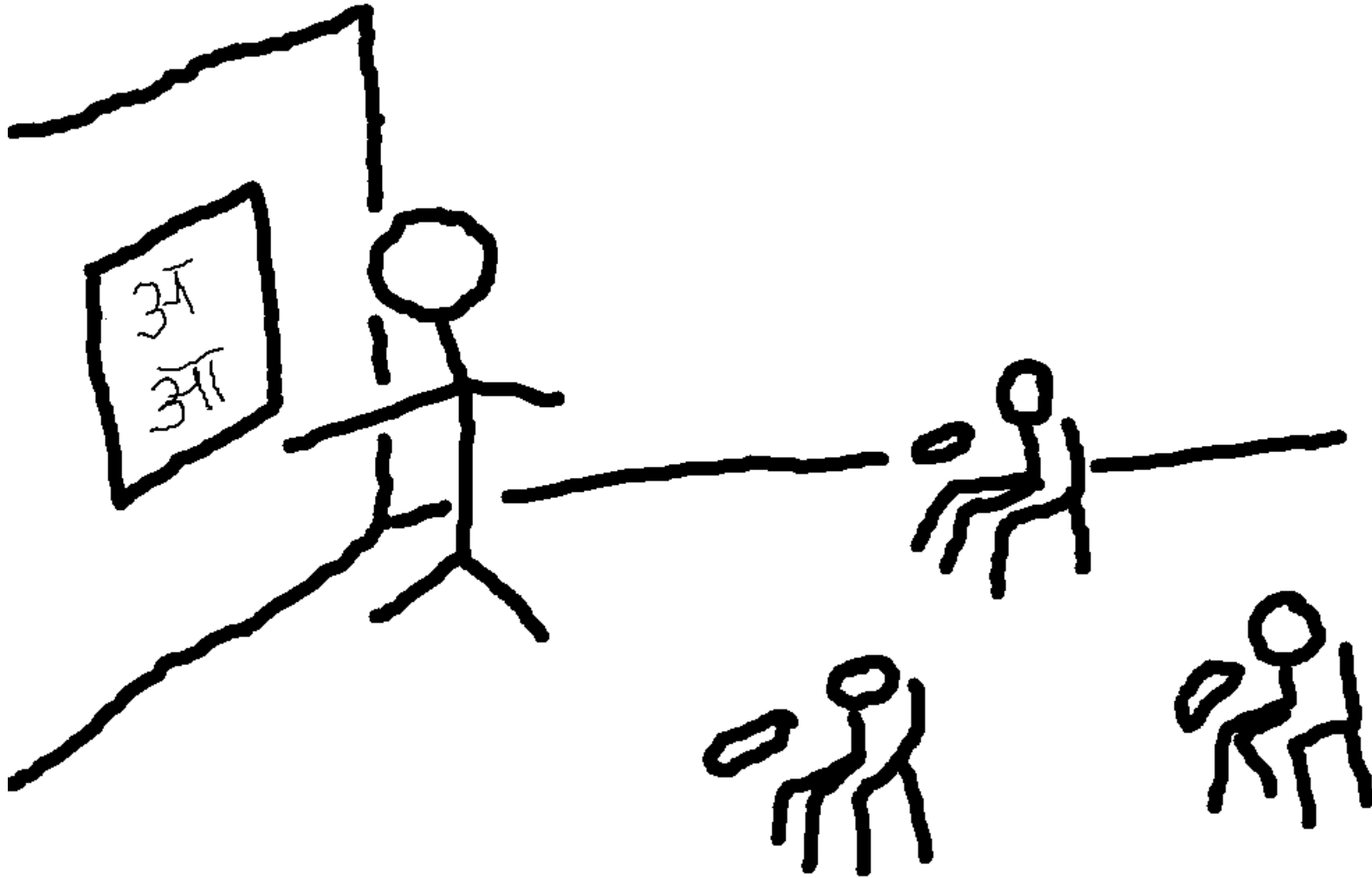
Early efforts

Seymour Papert

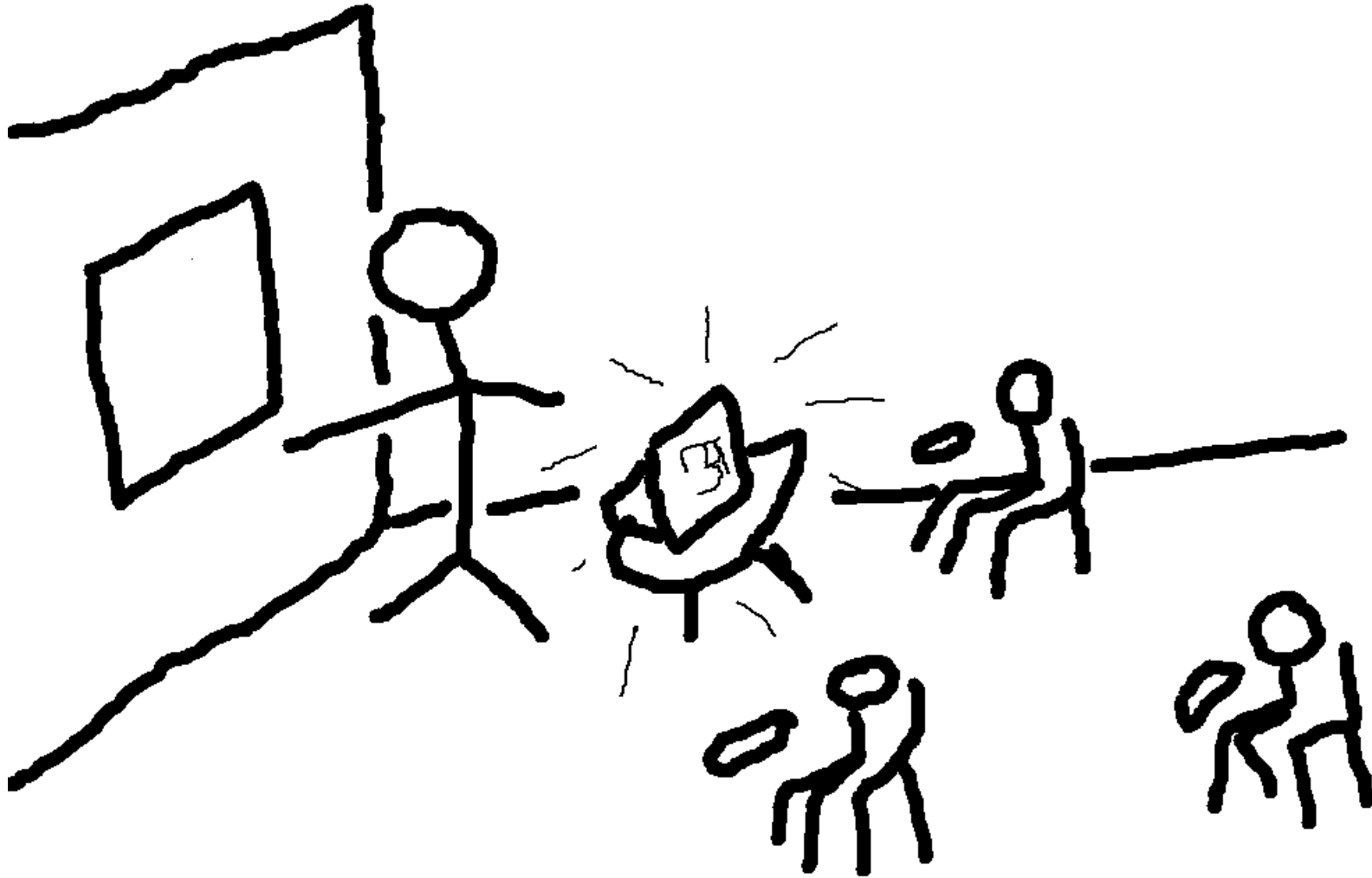
- 1967 : Invents Logo
- Develops constructionism learning theory 1960-1980.
- Children's machine – Learning in the digital age

Constructionism = *"Learning by Doing"*

Drug-study Methodology



Drug-study Methodology



Until now, computers failed to transform school

"If the role of the computer is so slight that the rest can be kept constant, it will also be too slight for much to come of it."

— Seymour Papert

...Enter OLPC



UN World Summit 2005

OLPC XO-1, 2007



- 433MHz AMD Geode
- 1200x900 LCD
- 256MB DRAM
- 1GB solid-state disk
- 802.11s mesh wifi
- 640x480 camera
- Low-power operation
- Open Firmware

Ethiopia



Mongolia



India



Collaborating and Learning

2,000,000 Laptops
Over 40 Countries

But you've only seen half of it...



Sugar reinvents the use of
computers in education

Activities

The heart of sugar...

Duration:  4.0 s.

1

2

3

4

5

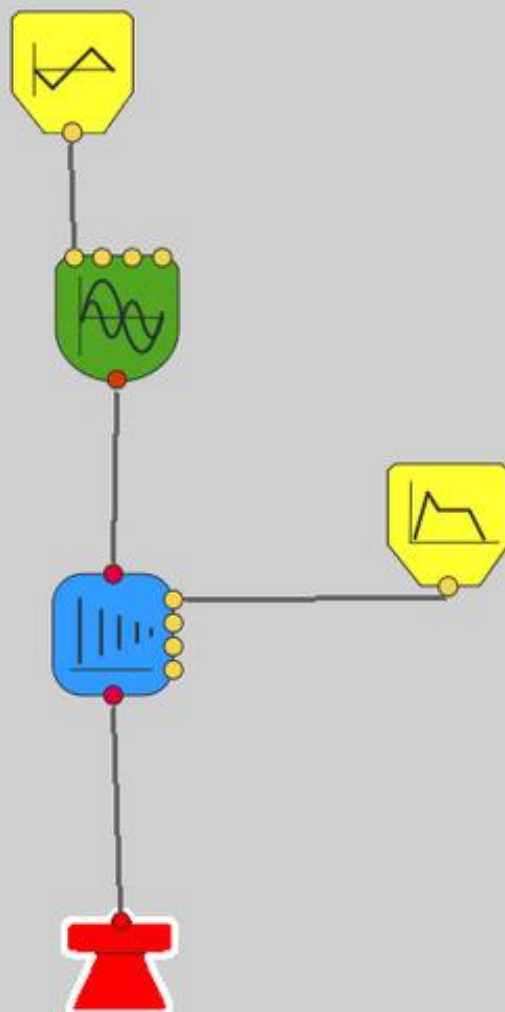
6



Activity

Main

Presets



Envelope



0.01

0.05

0.90

0.05



ADSR envelope apply
on the overall signal



Activity

Project

Numbers

number



+

-

x

/

mod

 $\sqrt{\quad}$

random

min

max

>

<

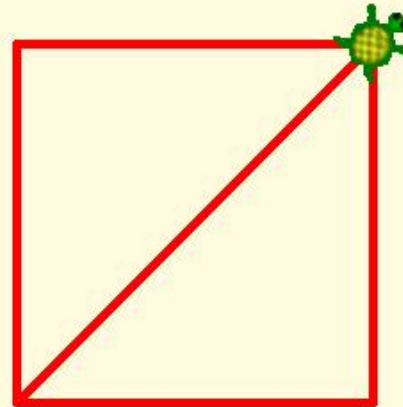
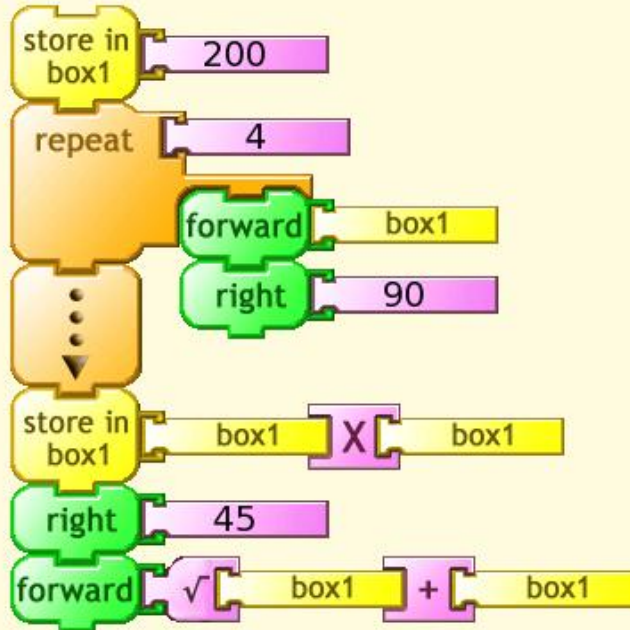
=

and

or

not

print





Examples

▼ math

apples

pascal

times1

times2

▼ graphics

jump

▼ python

function

if

▼ string

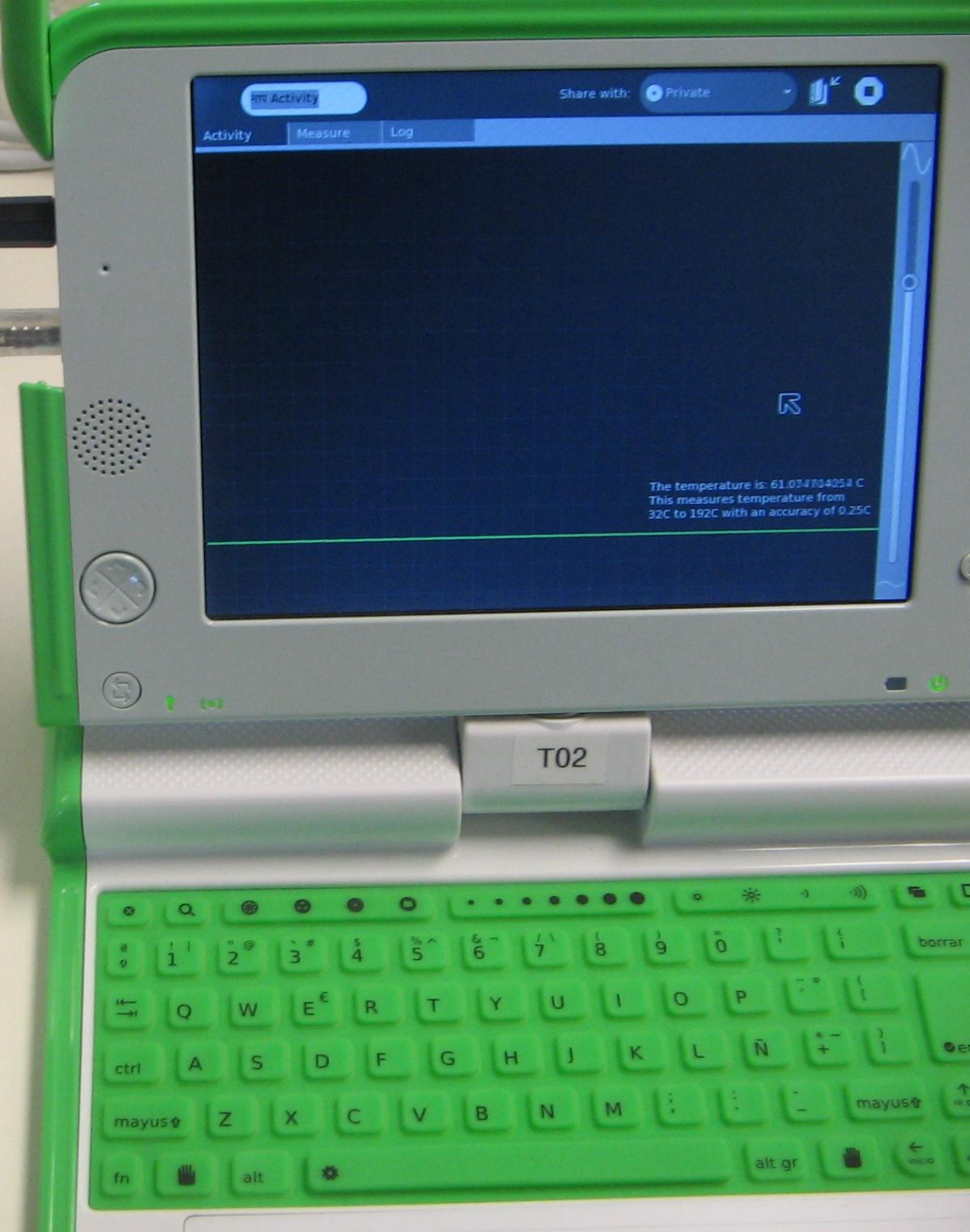
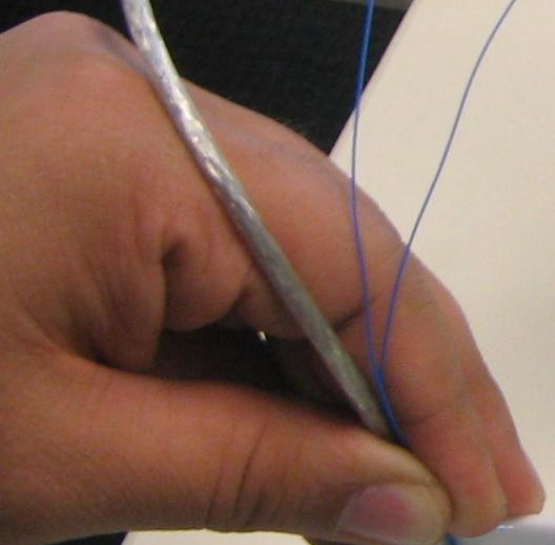
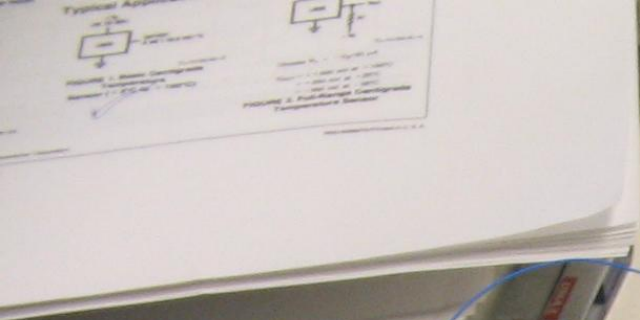
hello1

hello2

```
1 number = input("Enter a number: ")
2
3 if number > 5:
4     print "Greater than 5"
5 elif number < 5:
6     print "Less than 5"
7 else:
8     print "Number is 5!"
9
```

Run!

```
Enter a number: 6
Greater than 5
█
```

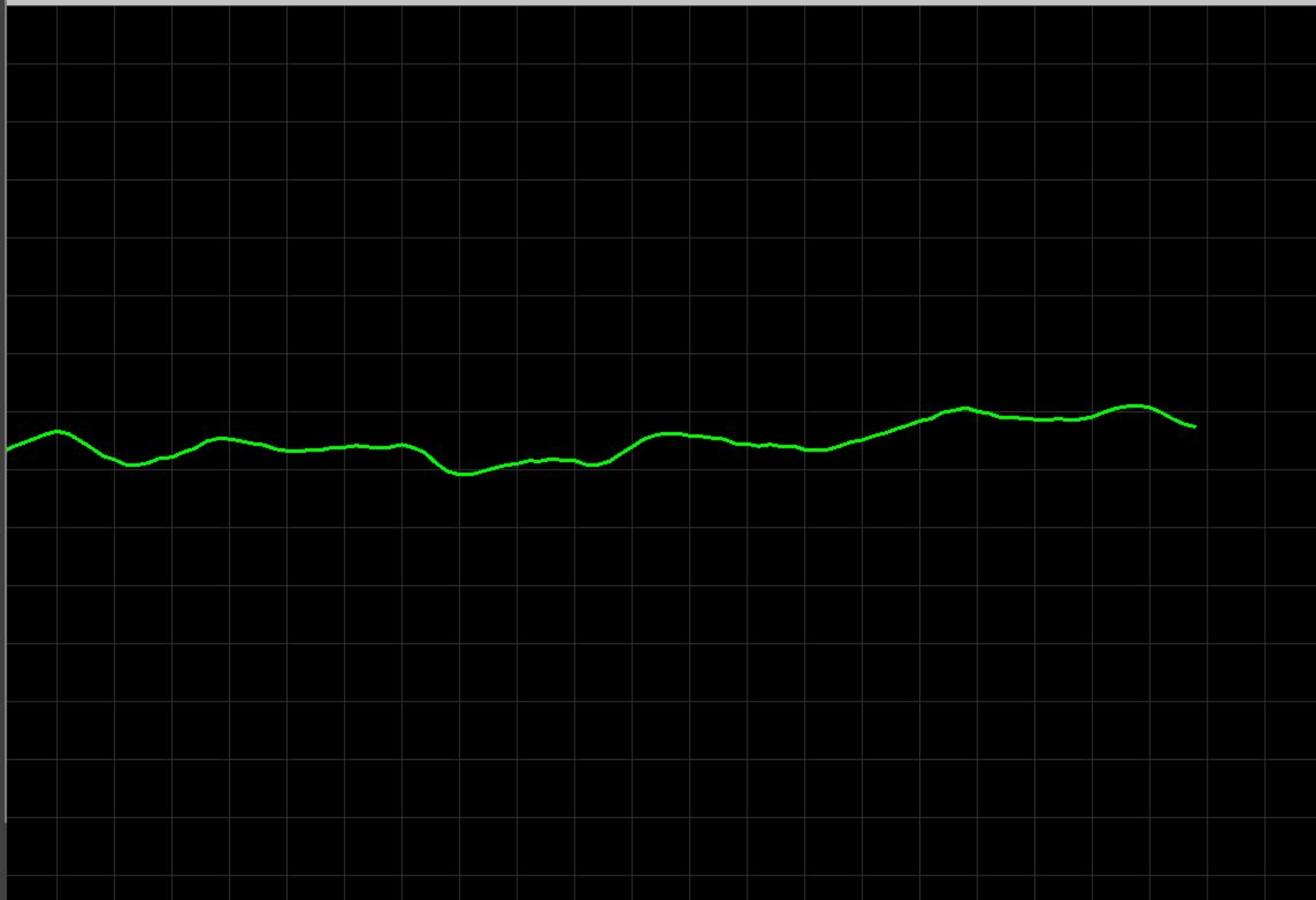





Activity

Measure

Log





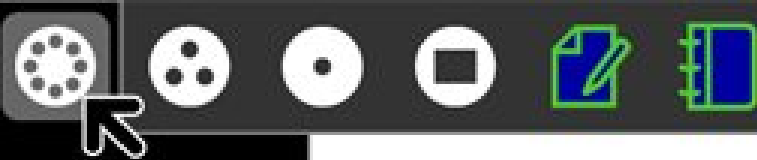
Dup dor a'az Mubster!	____/	Bonjour, enfants du monde!
Ciao, bambini di tutto il mondo!	o	¡Hola, chicos del mundo!
Hallo, Kinder der Welt!	.X_	Hallo, kinderen van de wereld!
Hello, children of the world!	//_=_=_\\	Olá, crianças do mundo!

[olpc@xo-AE-EC-97 ~]\$ █

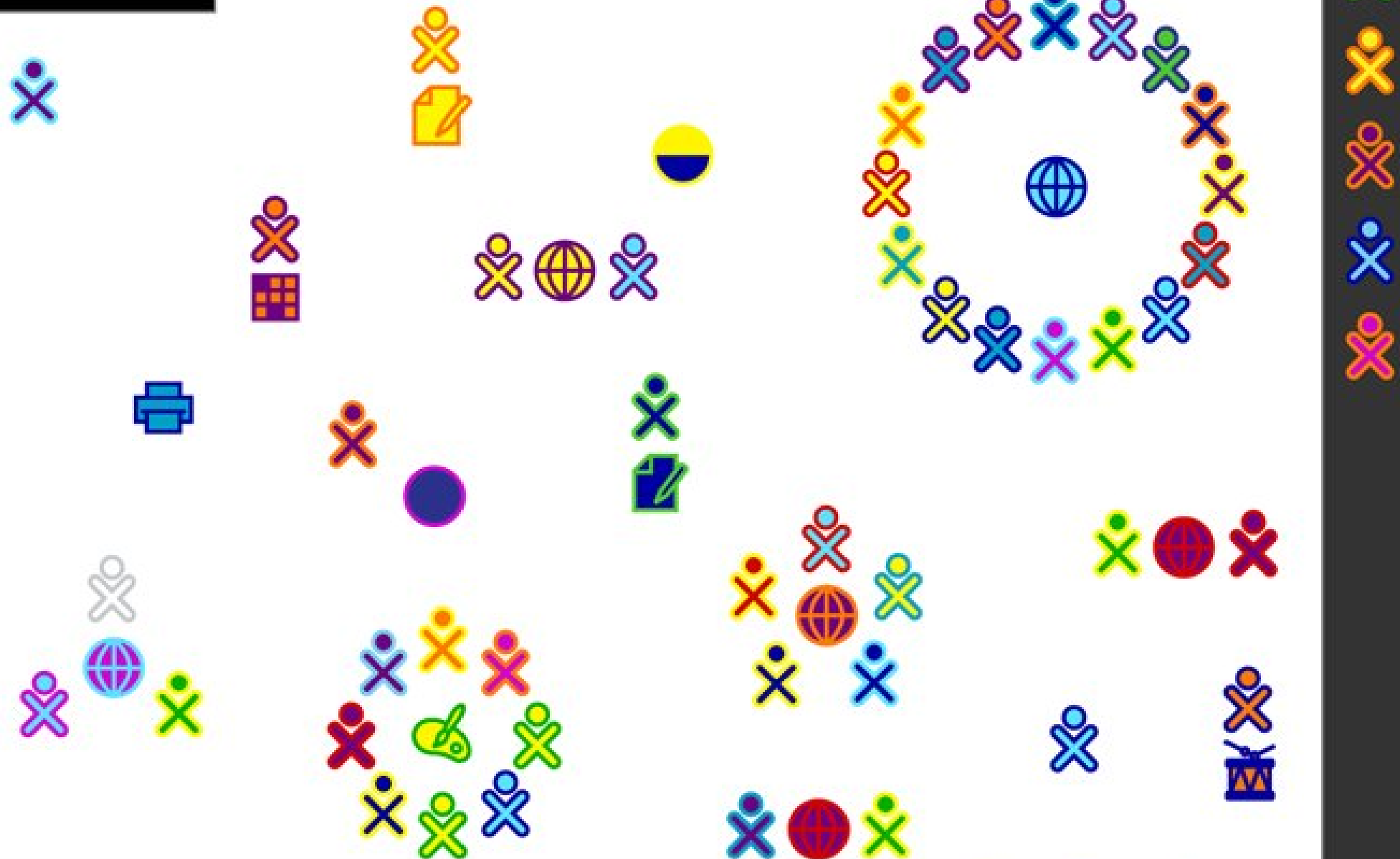
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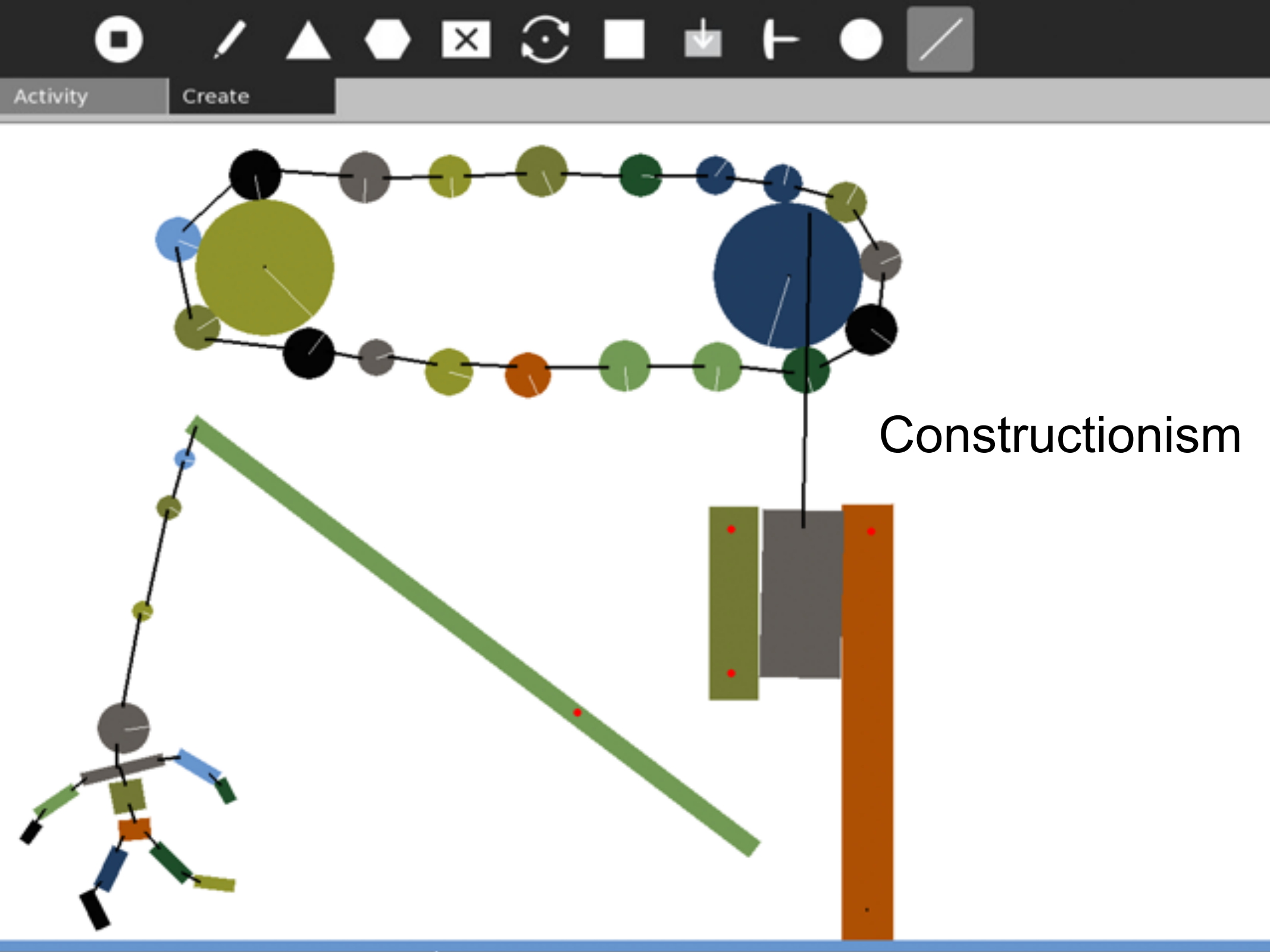
Core Ideas

Collaboration

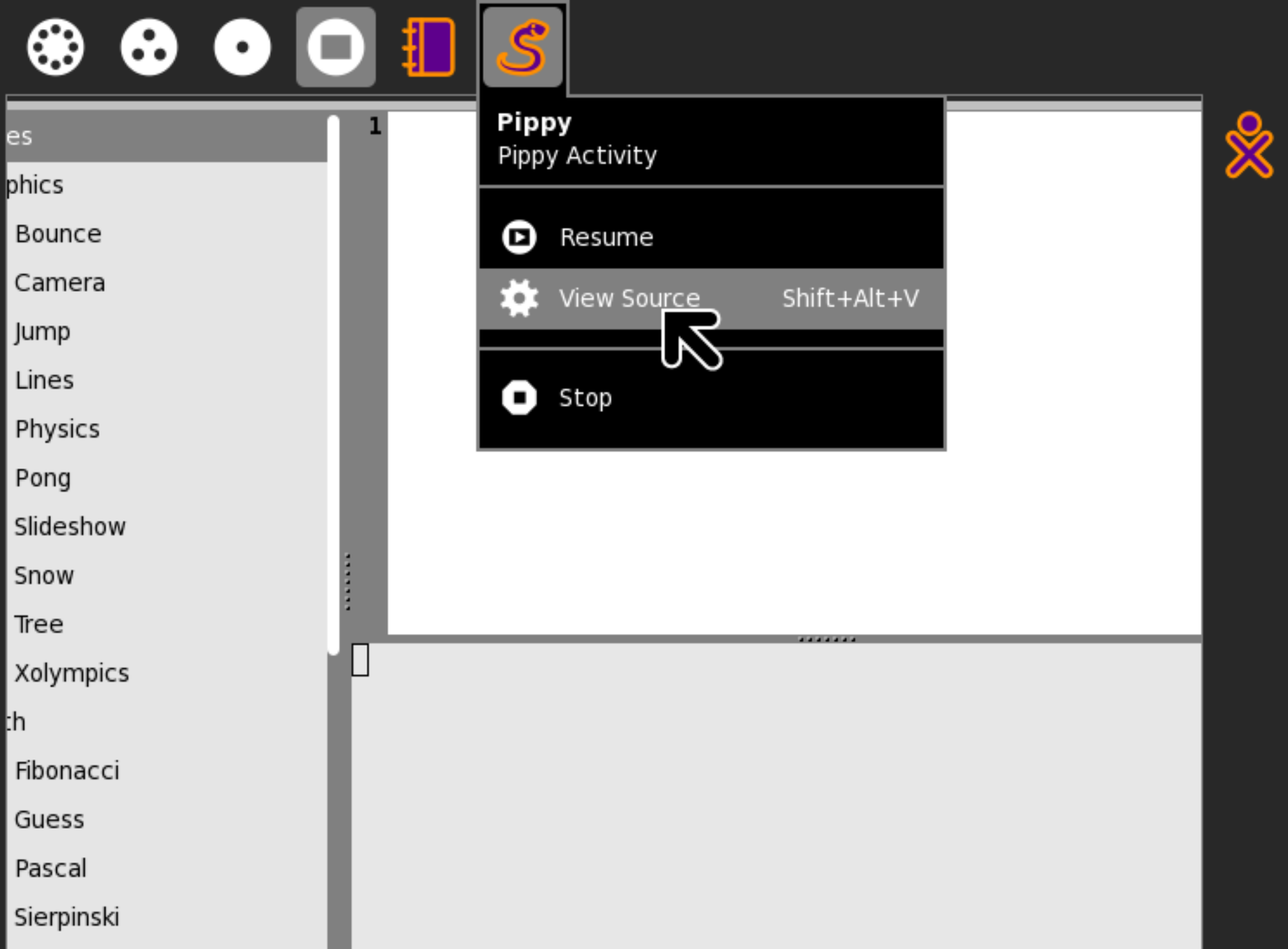


Neighborhood





Constructionism
























Everyone's a hacker



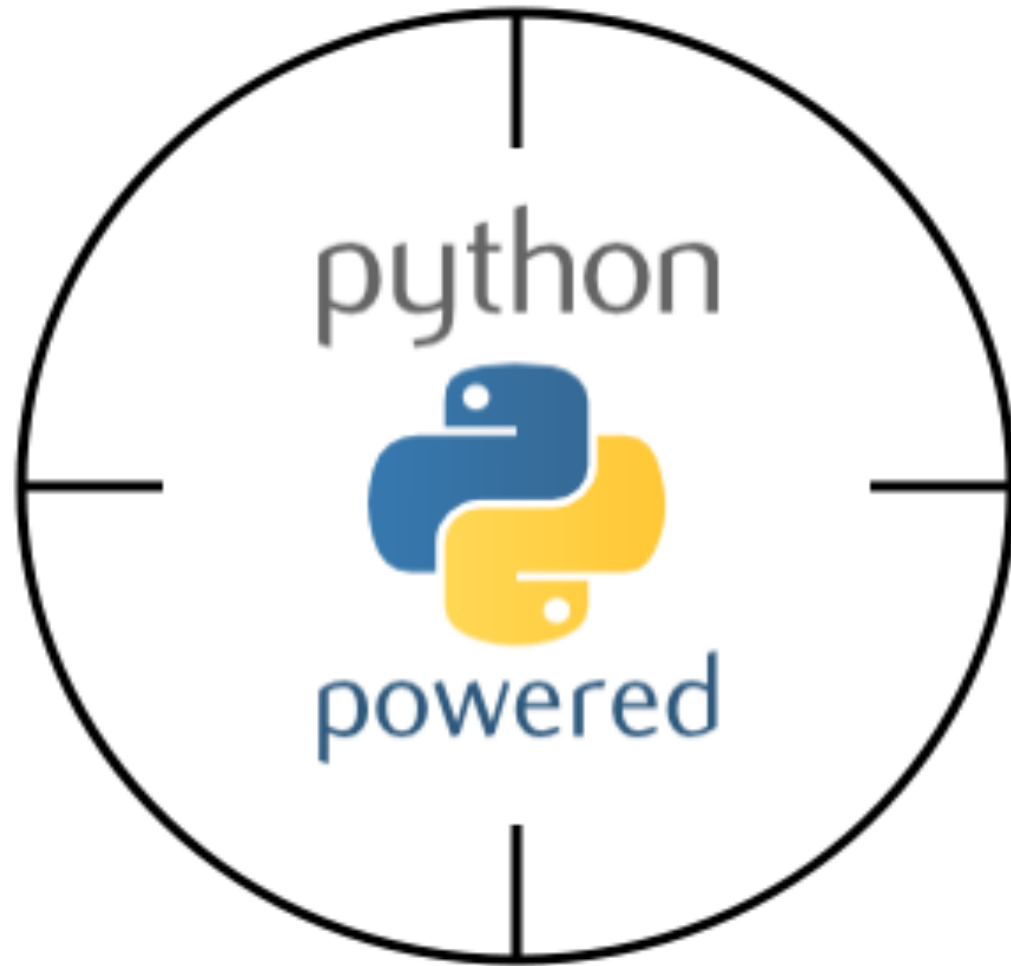
Anything

Anytime

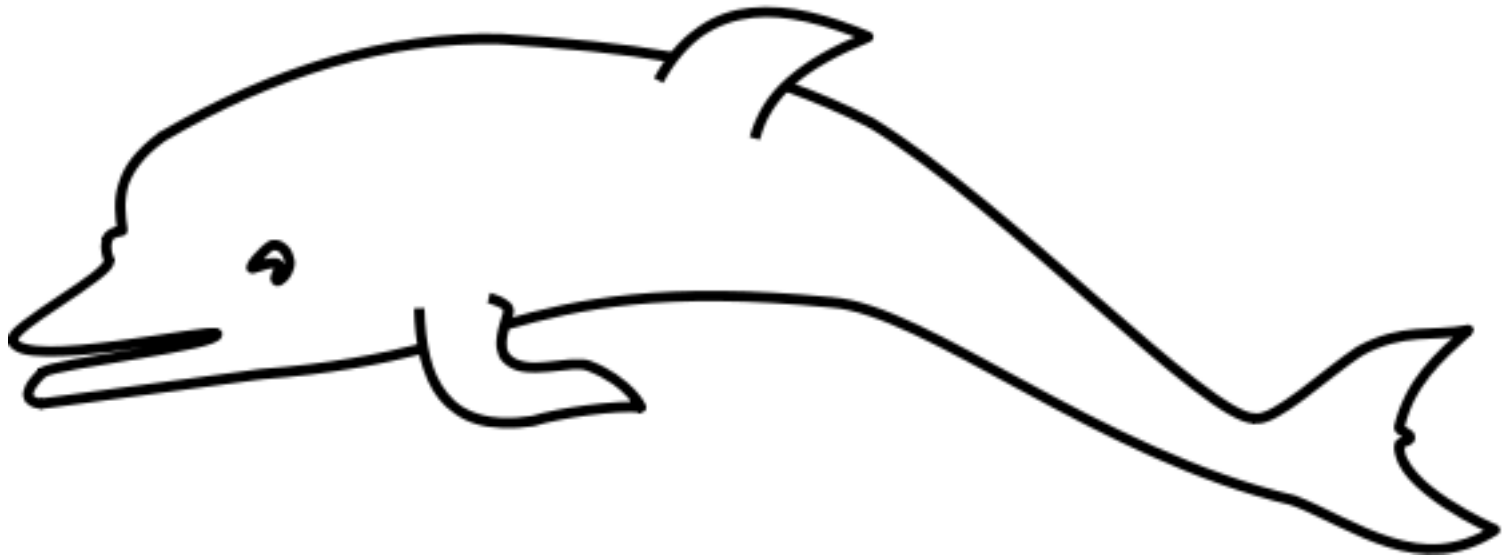
-   **Pippy Activity** 1 hour, 41 minutes ago 
-   **Physics Activity** 1 hour, 44 minutes ago 
-   **Labyrinth Activity** 1 hour, 47 minutes ago 
-   **Labyrinth Activity** 1 hour, 48 minutes ago 
-   **Terminal Activity** 1 week, 5 days ago 
-   **Record Activity** 1 week, 5 days ago 
-   **Log Activity** 2 weeks, 1 day ago 



Journal



Lets dive deeper

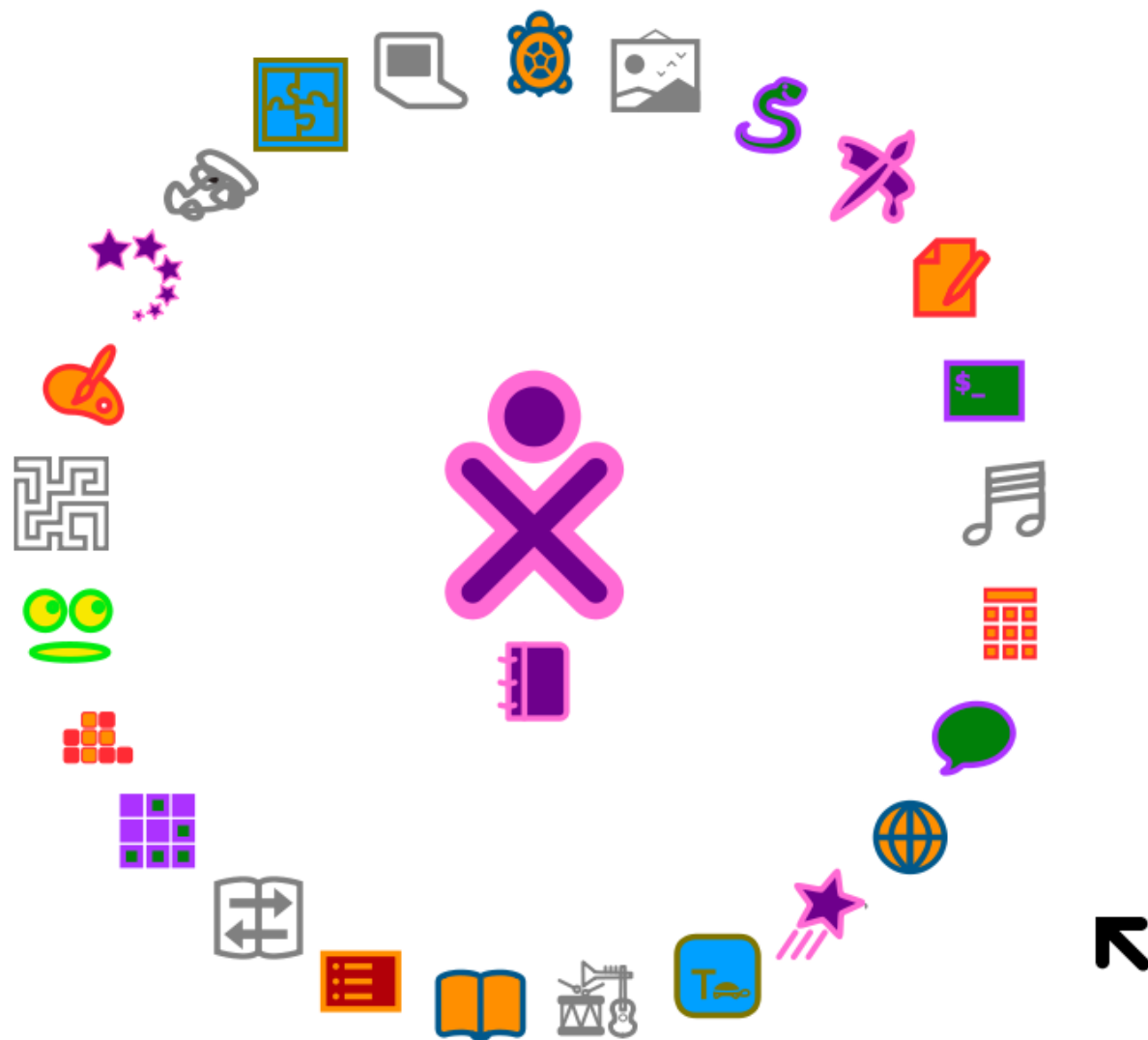


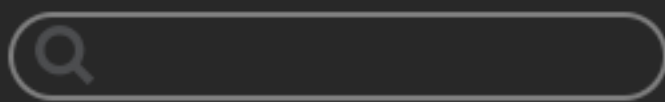
Core technologies



Main components

- Sugar
 - Control Panel
 - Frame
 - Journal
 - Desktop
- Sugar-toolkit
- Sugar-artwork
- Sugar-datastore





About Me



About my Computer



Date & Time



Frame



K



Language



Modem Configuration



Network



Software update

Control Panel


























Frame





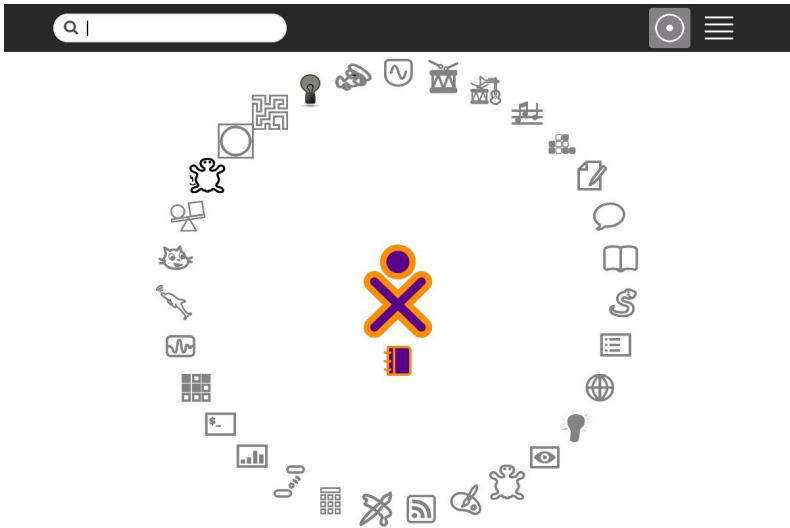
Anything

Anytime

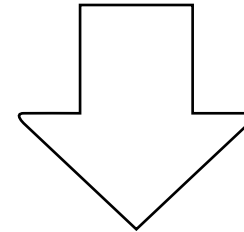
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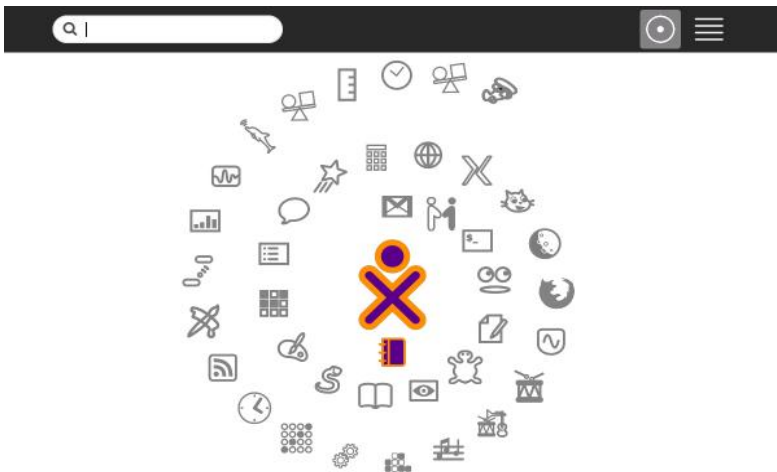
Journal



Easy to Change



```
def _calculate_position(self, radius, icon_size, index, count):
    width, height = self.box.get_allocation()
    angle = index * (2 * math.pi / count) - math.pi / 2
    x = radius * math.cos(angle) + (width - icon_size) / 2
    y = radius * math.sin(angle) + (height - icon_size -
                                   style.GRID_CELL_SIZE) / 2
    return x, y
```



```
def _calculate_position(self, radius, icon_size, index, count):
    width, height = self.box.get_allocation()
    angle = index * (math.pi / (6 + index / 12)) - math.pi / 2
    radius = ((radius - _MIN_RADIUS) * (index * 1.1) / count) +
              _MIN_RADIUS
    x = radius * math.cos(angle) + (width - icon_size) / 2
    y = radius * math.sin(angle) + (height - icon_size -
                                   style.GRID_CELL_SIZE) / 2
    return x, y
```

API Components

- sugar.bundle
- sugar.activity
- sugar.datastore
- sugar.graphics
- sugar.presence

START A PROJECT THAT WILL CHANGE KIDS' LIVES WORLDWIDE!



Developer resources

- Wiki:
 - wiki.sugarlabs.org
 - wiki.laptop.org
- IRC (on network irc.freenode.net):
 - [#sugar](#)
 - [#sugar-newbies](#)
 - [#olpc-devel](#)
- Mailing lists:
 - sugar-devel@lists.sugarlabs.org
 - devel@lists.laptop.org
 - grassroots@lists.laptop.org

Try sugar...

- Head to <http://wiki.sugarlabs.org/go/Downloads> to find out the many ways to install sugar.
- Looking to hack sugar-core: try the sugar-jhbuild setup
- Most Linux distributions have sugar-* packages

FLOSS Manuals

- Learning Sugar: flossmanuals.net/Sugar
- Making Sugar Activities: flossmanuals.net/ActivitiesGuideSugar

Get cracking today

- Install sugar
- Subscribe to mailing lists
- Start fixing tickets marked sugar-love ;-)

Danke!