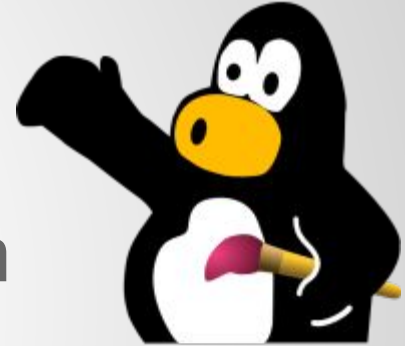


Tux Paint

Open Source Fun for the Elementary Classroom



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What is “Open Source Software”?

“Computer software with its source code made available and licensed with a license in which the copyright holder provides the rights to study, change and distribute the software to anyone for any purpose.” -wikipedia [“Open Source Software”](#)

Two kinds of “free”:

- *gratis* (zero cost)
- *libre* (freedom)

Like two kinds of “hot”:

- *caliente* (heat)
- *picante* (spicy)

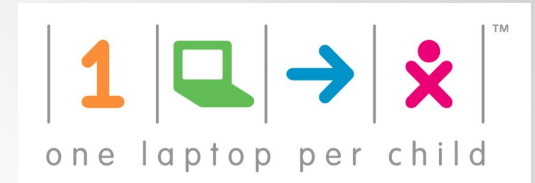
Examples of Open Source Software

- Linux [operating system] <http://www.linux.com/>
- GIMP & Inkscape [graphics editor] <http://www.gimp.org/>
- OpenOffice/LibreOffice [office] <http://www.openoffice.org/>
- Firefox [web browser] <http://www.mozilla.org/>
- MPlayer & VLC [video players] <http://mplayerhq.hu>
- Audacity [audio editor] <http://audacity.sourceforge.net/>
- MySQL [database] <http://www.mysql.com/>
- Countless networking, programming, business & scientific applications

Who uses Open Source?

- Governments
- Schools
- Individuals
- Businesses
 - IBM, Intel, Google, Apple, Oracle, E*Trade, Netflix, HP, Leapfrog, TiVo, Roku, etc.

Open Source in Education



- OLPC (One Laptop Per Child)
 - XO laptops (Sugar) & tablets (Android)
- Linux (as alternative to Windows or Mac on desktop)
- Linux (as server)
- Educational games & applications
- Productivity applications
- School management (wiki, content management (CMS), student information systems, etc.)
- Raspberry Pi

What is Tux Paint?

- Drawing/painting software designed for children (as young as 3 years old)
- Includes numerous “Magic” effects tools
- Includes hundreds of “stamp” images
- Text & sound cues help make it educational
e.g., “A duck”, visual text and spoken sound, then “*quack quack*” sound
- Translated (at least partially) into 85 languages
- Includes basic slide-show feature
- Saves in open, web standard “PNG” image format
- Separate configuration tool for parents/teachers

Why the Penguin?

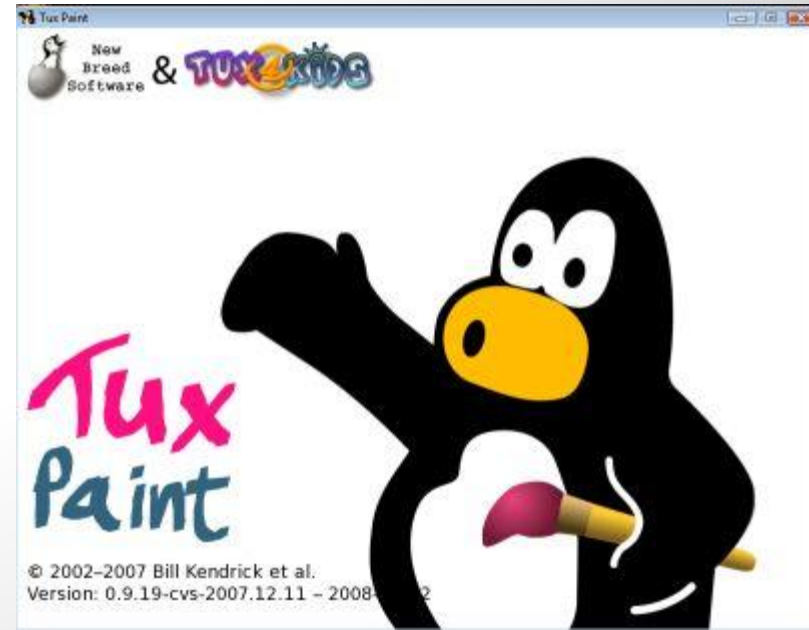


Tux is the official mascot of the Linux kernel, created during a logo competition in 1996. -wikipedia [“Tux”](#)

Sam Hart, creator of *Tux Typing* and founder of Tux4Kids, chose to use Tux in educational games.

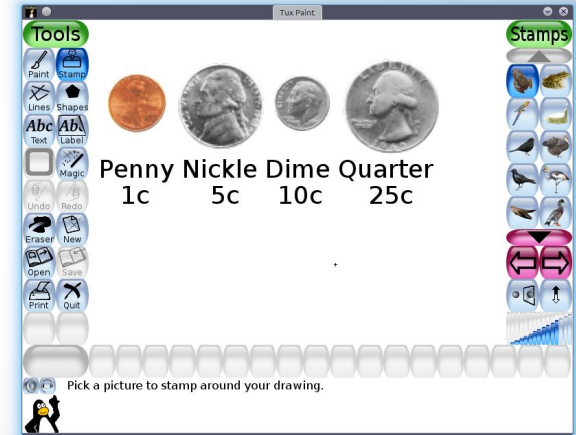
Tux Paint's penguin was originally from *Tux, of Math Command (TuxMath)* -- art originally by Sam Hart, code originally by Bill Kendrick.

The penguin is cute & friendly, so we assumed kids would like it!



Tux Paint Tour... overview

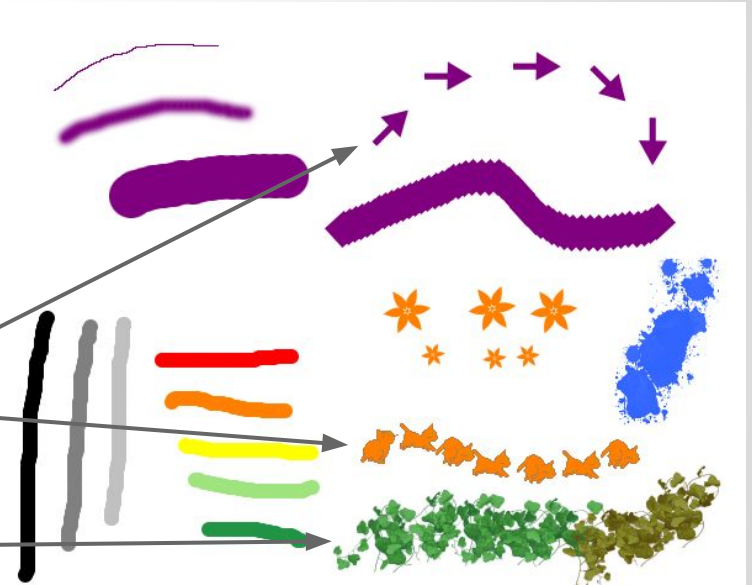
<p>Drawing</p> <ul style="list-style-type: none">● Paint● Lines● Shapes● Eraser <p>Text</p> <ul style="list-style-type: none">● Text● Label*● On-screen keyboard* <p>Special tools</p> <ul style="list-style-type: none">● Stamps● Magic	<p>Controls</p> <ul style="list-style-type: none">● Undo / Redo● New<ul style="list-style-type: none">○ Solid colors○ Coloring-book templates○ 2-layer templates○ Kid Pix support*● Open<ul style="list-style-type: none">○ Slides● Save● Print● Quit
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* Coming in the next release

Tux Paint Tour... Drawing

- Freehand paint tool
- Line-drawing tool
- Variety of paint brushes
 - Some animated
 - Some directional
 - Some with shaded detail
- Solid & outlined polygons & other shapes
- Various sizes of square & circular erasers



Tux Paint Tour... Over 50 magic tools*

Drawing	Effects-only	Drawn effects
<ul style="list-style-type: none">● Bricks● Calligraphy● Grass● Train tracks● Rainbows● Snow, rain● ...	<ul style="list-style-type: none">● Shift● Perspective● Waves● Zoom● ...	<p>(Can be painted, but often can also affect entire picture at once)</p> <ul style="list-style-type: none">● Tint● Blur, Smudge● Ripples● Negative● ...

* Nearly 70 tools will be included in the forthcoming version.

Note: As of 2007, Magic tools are loaded as “plug-ins”, which means programmers can add new tools relatively trivially! Since then, 40 more tools added by various contributors!

Tools - Painting with Light

Velcro Poster

Point out the labeled icon

Use hand motions

RASP (Repeat, Recite, Read, by All, by Some, and by one Person)

Redo and Undo (Lays a foundation for writing practices later on)



Tux Paint Tour... Magic tools example



Magic tools used:

- Bricks
- Blur
- Smudge
- Rails
- Emboss
- Negative
- Symmetric left/right
- Shift
- Snowflakes
- Fold
- Flowers

Other tools:

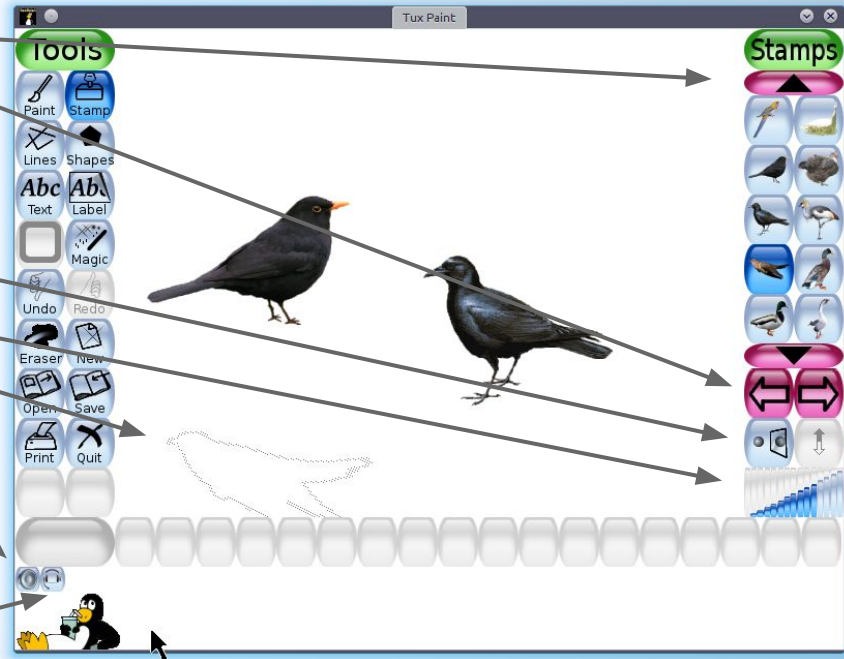
- Text
- Paint
- Eraser

Tux Paint Tour... Stamps

- Nearly 800 raster bitmap stamps (PNG)
 - Over 250 scalable vector stamps (SVG)
 - Sound effects
 - Textual descriptions (localizable)
 - Audible descriptions (localizable)
 - Hierarchy of categories
- animals
 - clothes
 - food
 - hobbies
 - household
 - medical
 - military
 - natural forces
 - people
 - plants
 - seasonal (holidays, etc.)
 - space (astronomy)
 - sports
 - symbols (money, letters, numbers, signs)
 - town
 - vehicles

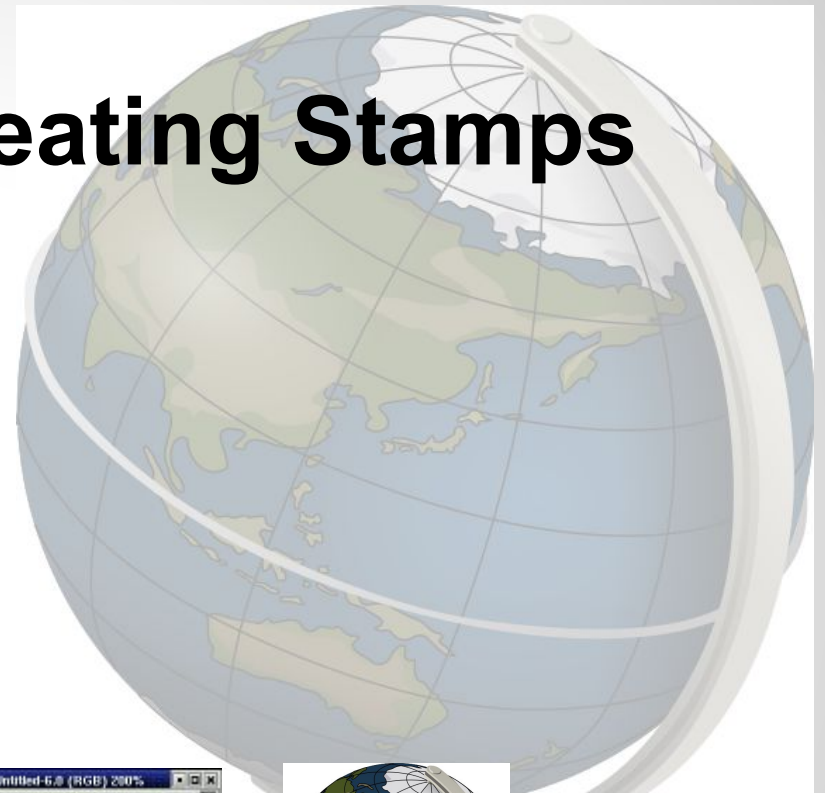
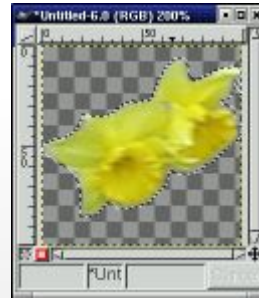
Tux Paint Tour... Using Stamps

- Up/down within category
- Left/right between categories
- Mirror / Flip
- Change size
- Click in image to place
- Click 'speaker' icon to hear sound effect again
- Click 'headset' icon to hear description again



Tux Paint Tour... Creating Stamps

- PNG bitmaps
 - Good for photorealistic objects
 - 24bpp color support (better than GIF)
 - Not lossy (unlike JPEG)
 - Alpha-blended transparency
- SVG vectors
 - Good for cartoons / line drawings
 - Also high-color & transparent
 - Scale better than reasonably-sized bitmaps
- TXT files (UTF-8 Unicode) with descriptions / translations
- WAV or OGG sound effect recordings
- WAV or OGG descriptive sounds (can be in different languages)
- TXT files for features/hints (Tint, default size, mirror/flip?, etc.)



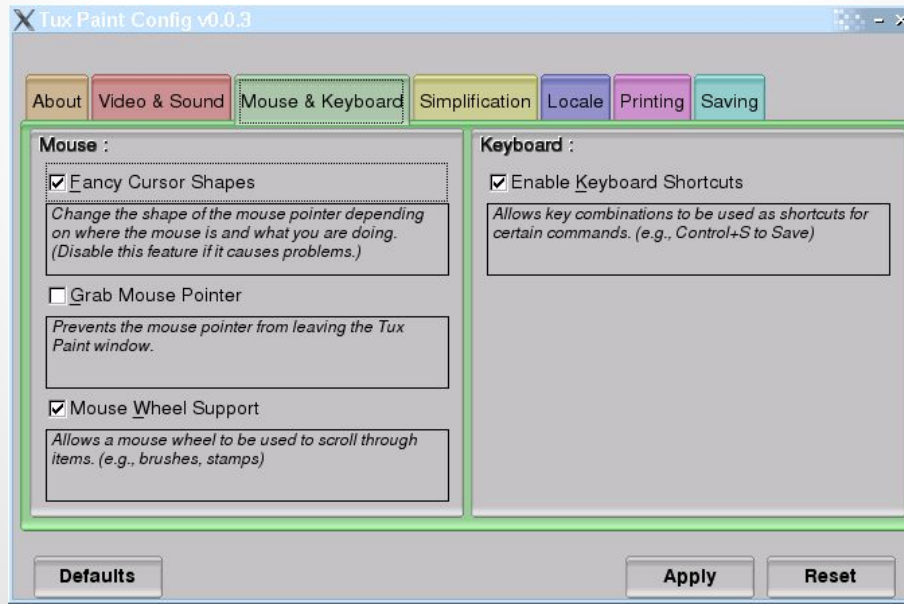
Tux Paint Tour... Other Controls

- *Multiple levels* of undo/redo
- One-click save (no filenames, browsing (yet))
 - Save over / save new -- can be set to a default action (no questions asked)
- Basic slideshows available via “Open” dialog
- Create new images from solid colors, black outline (“coloring book”), or one-or-two-layer templates
 - Supports PNG, JPG, SVG (vector), Kid Pix (next release)
- One-click print (or Alt/Option+click for dialog)
 - Can be disabled or limited (1 print every X minutes)
- Quit can be disabled (magic key combo to quit)



Tux Paint Config.

A user-friendly tool for setting Tux Paint's configuration (which itself is just a TXT file you can edit in Notepad!)



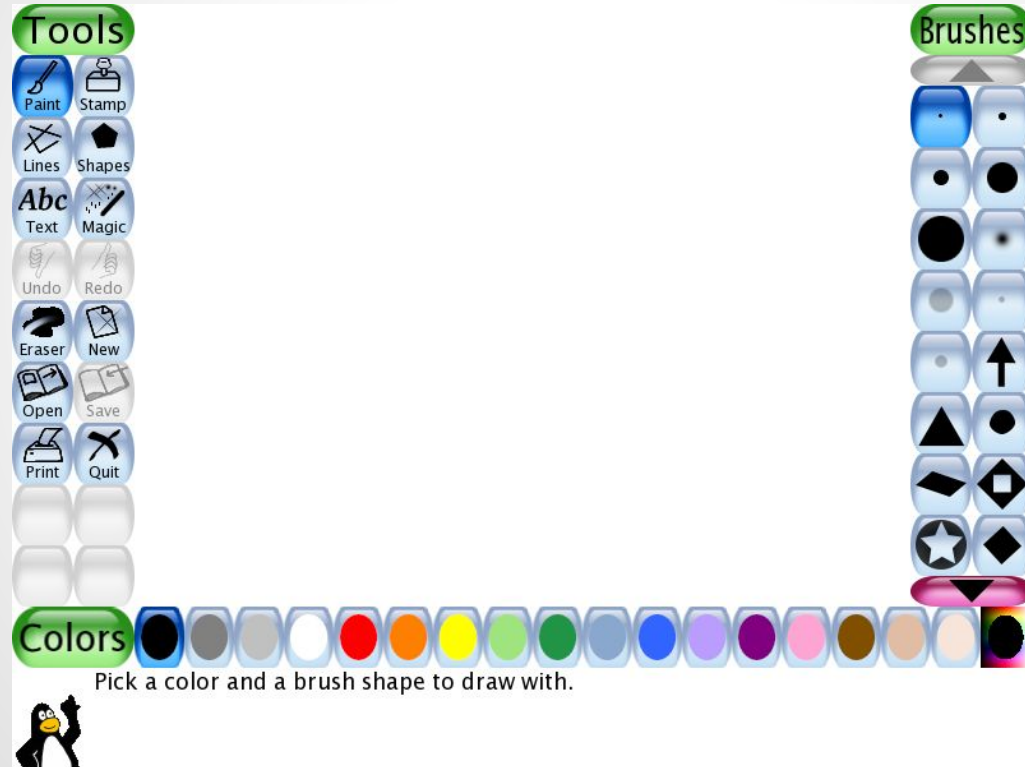
Creating Tux Paint

- Why
 - There was no “kid-friendly” drawing program for Linux, only *GIMP* (like PhotoShop, and was notoriously hard to use, even for adults)
 - I had done numerous games on Linux, including the initial *TuxMath* for Tux4Kids. (Did not expect to be actively working on it 11 years later!)
- How
 - Utilized Simple DirectMedia Layer (libSDL), which I had used to write a number of games for Linux. Had the advantage of being ported to Windows & Mac.
 - Written in C programming language.
 - All of the UI (user interface; buttons, pop-ups, etc.) was implemented within Tux Paint. (Note the “Simple” in SDL)

Decision-making in Tux Paint

- Initial design based on existing art software (especially stuff I used on Atari & Commodore computers in early 1980s)
- Simplicity inspired by UIs of PalmPilot PDA & TiVo DVR
- Avoided being “in your face” or annoying (not “for kidz”, “totally xtreme”, ‘ransom note’ fonts, etc.!))
- Meant as a tool for creativity first, education & amusement second
- Driven by user feedback & our own whims (I try to rein in features that might increase UI complexity)
- Features, bugs & roadmap tracked in SourceForge.net project <https://sourceforge.net/projects/tuxpaint/>

Tux Paint in the Classroom



Building Foundations

- Literacy (connecting icon to word)
- Writing (undo & redo)
- Number operations and 1-to-1 correspondence (stamps)
- Art and Design (colors)
- Digital Word and Image

Better than Commercial

- Free (price)

Kids can go home and install it legally

- No advertising

- Portable

Windows (Win8 all the way back to Win95), Mac OS X, Linux, iPad, others

- Extensible

- open platform -- adding new *content* is fully documented & supported
- open source code -- adding new *features* is documented & supported

This doesn't just apply to *Tux Paint!*

Activities

The image shows a drawing application interface. On the left is a **Tools** toolbar with icons for Paint, Stamp, Lines, Shapes, Text, Magic, Undo, Redo, Eraser, New, Open, Save, Print, and Quit. On the right is a **Brushes** toolbar with various brush shapes and sizes. At the bottom is a **Colors** palette with 24 color swatches. The central canvas is purple and contains a drawing of a figure-eight shape with a rainbow gradient, enclosed in a dashed rectangular border. Below the interface, the text "Pick a color and a brush shape to draw with." is displayed, accompanied by a small cartoon penguin icon.

ABC & 123 Books

The image shows a digital drawing application interface. At the top left, the text "ABC & 123 Books" is displayed. The main workspace contains the text "I see five fish." and a large blue outline of the number "5". Five colorful fish are scattered around the text: a clownfish, a blue tang, a blue tang, a blue tang, and a striped tang. The interface includes several toolbars: "Tools" on the left with icons for Paint, Stamp, Lines, Shapes, Text, Magic, Undo, Redo, Eraser, New, Open, Save, Print, and Quit; "Brushes" on the right with various brush shapes and sizes; and "Colors" at the bottom with a color palette. The word "Blue!" is written below the color palette, and a small cartoon penguin is in the bottom left corner.

Tools

- Paint
- Stamp
- Lines
- Shapes
- Text
- Magic
- Undo
- Redo
- Eraser
- New
- Open
- Save
- Print
- Quit

Brushes

I see five fish.

5

Colors

Blue!

Math Stories- Addition

Tools

Paint Stamp
Lines Shapes
Text Magic
Undo Redo
Eraser New
Open Save
Print Quit

Stamps

If I have five apples and three oranges, how much fruit do I have in all?

A mandarin orange.

Math Stories -Subtraction

Tools

- Paint
- Stamp
- Lines
- Shapes
- Text
- Magic
- Undo
- Redo
- Eraser
- New
- Open
- Save
- Print
- Quit

Brushes

Colors

If there are five birds by a pond and three fly away,
how many birds will be left by the pond?

Pick a color and a brush shape to draw with.



Symmetry (Kaleidoscope)

The image shows a digital drawing application interface. The central canvas displays a complex, symmetrical pattern of blue and purple lines on a black background, resembling a kaleidoscope or a stylized mandala. The pattern is mirrored across a vertical axis. The interface includes several toolbars and panels:

- Tools:** A vertical toolbar on the left containing icons for Paint, Stamp, Lines, Shapes, Text, Magic, Undo, Redo, Eraser, New, Open, Save, Print, and Quit.
- Magic:** A vertical toolbar on the right containing icons for Darken, Distortion, Drip, Edges, Emboss, Fill, Fisheye, Flip, Flower, Foam, Fold, Glass Tile, Grass, and Kaleidoscope.
- Colors:** A horizontal color palette at the bottom, featuring a variety of colored circles for selection.

Below the color palette, there is a text instruction: "Click and drag the mouse to draw with symmetric brushes (a kaleidoscope)." In the bottom-left corner, there is a small penguin icon.

Clock

Tools

Paint Stamp

Lines Shapes

Text Magic

Undo Redo

Eraser New

Open Save


Print Quit

Brushes

My favorite time of day is when school ends.

Colors

Pick a color and a brush shape to draw with.



Animal Shapes

Tools


- Paint
- Stamp
- Lines
- Shapes
- Text
- Magic
- Undo
- Redo
- Eraser
- New
- Open
- Save
- Print
- Quit

Brushes

Colors

Pick a color and a brush shape to draw with.

Triangle Dog



Names

The image shows a digital drawing application interface. On the left is a 'Tools' panel with icons for Paint, Stamp, Lines, Shapes, Text, Magic, Undo, Redo, Eraser, New, Open, Save, Print, and Quit. On the right is a 'Stamps' panel with various hand-drawn icons and navigation arrows. At the bottom is a 'Colors' palette with 24 color swatches. The main canvas displays the name 'Susie' in three different styles: a red sans-serif font, a large purple outlined font, and a blue bubbly font with a small blue heart above the 'i'. Below the purple 'Susie' are five hand-drawn black-and-white illustrations of hands in different poses. At the bottom left, there is a small penguin icon and the text 'The letter e.'

It is okay to be different...

The image shows a digital drawing application interface. At the top, the text "It is okay to be different..." is displayed. Below it, a central canvas area shows a cartoon character with brown skin, wearing black-rimmed glasses and a purple dress. The text "It is okay to wear glasses." is written in red below the character. The interface includes several toolbars: "Tools" on the left, "Magic" on the right, and "Colors" at the bottom. The "Tools" toolbar contains icons for Paint, Stamp, Lines, Shapes, Text, Magic, Undo, Redo, Eraser, New, Open, Save, Print, and Quit. The "Magic" toolbar contains icons for Bricks, Bricks, Calligraphy, Cartoon, Chalk, Color & White, Color Shift, Confetti, Darken, Distortion, Drip, Edges, Emboss, and Fill. The "Colors" toolbar contains a row of color swatches. A small penguin icon is visible in the bottom left corner.

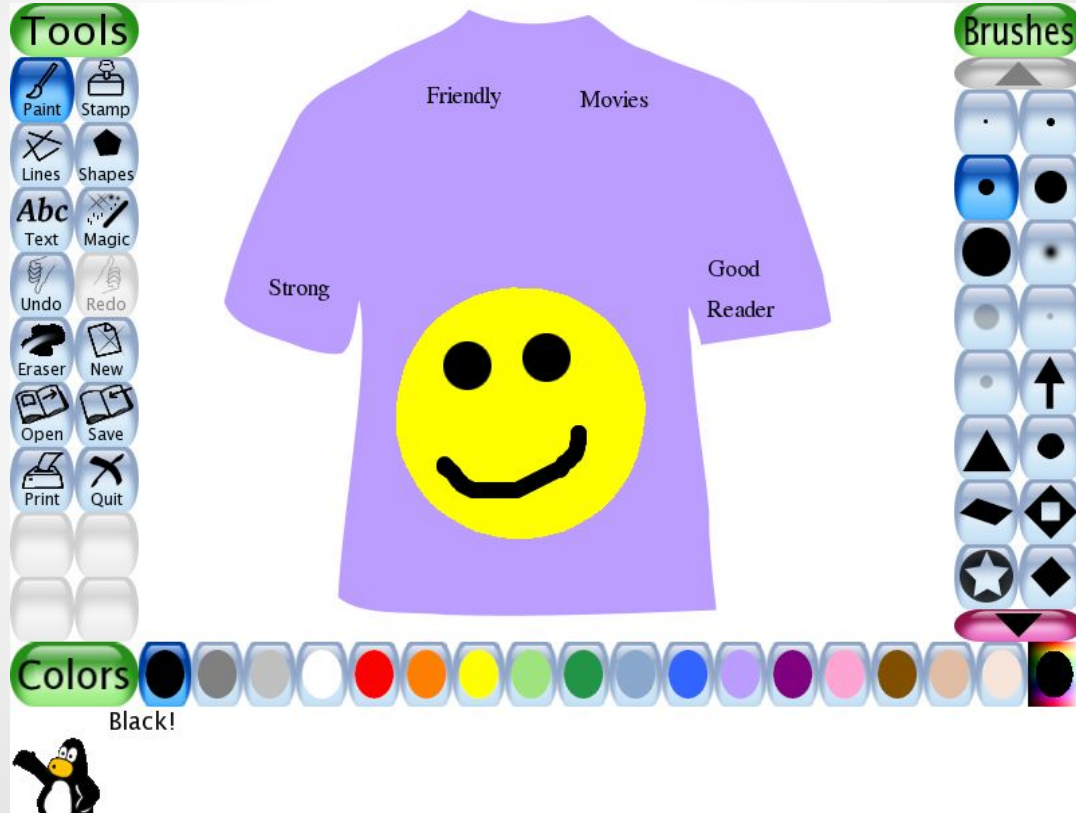
Tools

Magic

Colors

Click in the picture to fill that area with color.

Tribes T-Shirt Activity



Money

Tools

- Paint
- Stamp
- Lines
- Shapes
- Text
- Magic
- Undo
- Redo
- Eraser
- New
- Open
- Save
- Print
- Quit


Letters

- Aa
- Aa
- Aa
- Aa
- Aa
- Aa
- Aa
- AAA
- Aa
- AAA
- Aa

Colors

How much money do I have?

Choose a style of text. Click on your drawing and you can start typing.



Other Tux4Kids Fun!

TuxMath

<http://tux4kids.alioth.debian.org/tuxmath/>

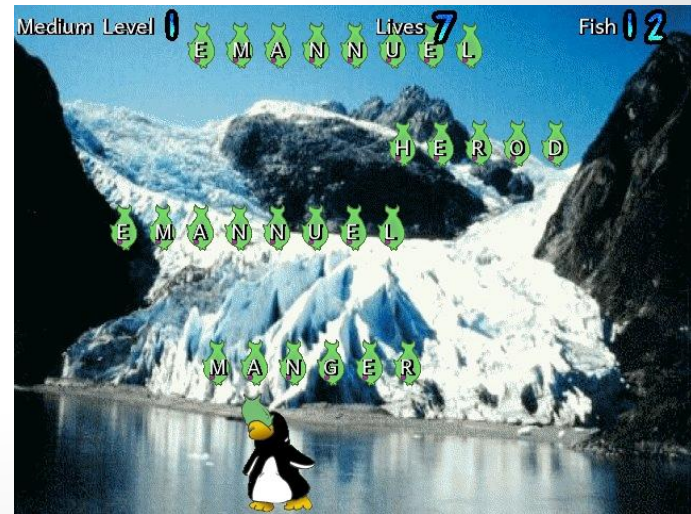
An arcade game that helps kids practice their math facts.



Tux Typing

<http://tux4kids.alioth.debian.org/tuxtype/>

An educational typing tutor for kids.



Older Kid Resources

- [GIMP](http://www.gimp.org/) (GNU Image Manipulation Program)
Open source alternative to PhotoShop for Linux, Windows, Mac OS X -- <http://www.gimp.org/>
- [Sumopaint.com](http://www.sumopaint.com/)
Closed-source painting software for desktop, browser, iPad -- <http://www.sumopaint.com/>
- [Queeky.com](http://queeky.com)
Closed-source painting software for desktop, browser -- <http://queeky.com>
- [Inkscape.org](http://inkscape.org)
Open Source alternative to Illustrator -- <http://inkscape.org>

Tips and Tricks

Restrict Stamps

Add custom Stamps

Limit Printing

Produce classroom books

Resources

Tux Paint <http://www.tuxpaint.org/>

Tux4Kids <http://tux4kids.alioth.debian.org/>

Ms. Susie's Elementary Website <http://mssusie.weebly.com>

Ms. Susie's Blog <http://rmssf.weebly.com/ms-susies-blog.html>

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