A Doodle Illustration Technique for Non-Artists

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Table of Contents

Section 1

Overview

Vector vs. Raster Graphics

Vector Graphics

- Unlimited resolution
- Smaller file size
- Reduced set of tools

Raster Graphics

- Limited resolution
- More tools, brushes, and effects
- More intuitive

Hint

You can convert vector into raster graphics easily, but the other way is limited!

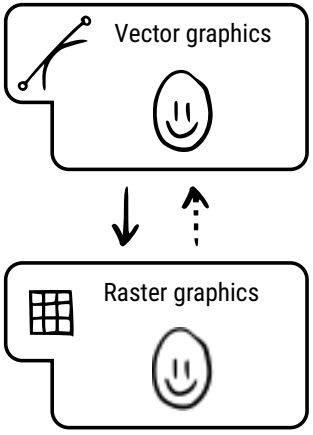


Figure: Vector vs. raster graphics

The Approach

Outline Base Color Lighting

Figure: The three main tasks

Section 2

Outlines

Sketching

- Search for references
- Try different variations and experiment with different shapes
- Finally select one of them as a reference for creating clean outlines

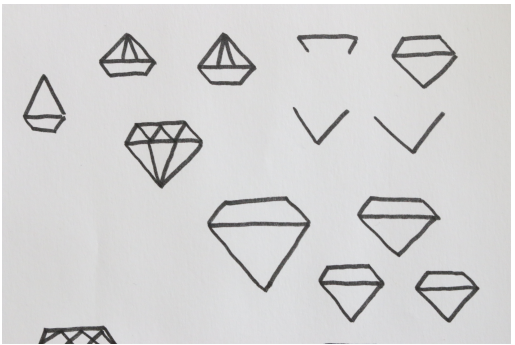


Figure: First attempts for sketching a gemstone

Analog/Digital Workflow

Pen & Paper

- Use a thick dark pen on light paper
- Digitize by taking a photo
  - High contrast
  - Reasonable lighting

(Pen) Tablet Benefits

- Undo
- Trace reference images
- Copy-paste allows for creating variations easily

Figure: A thick pen, paper and a smartphone camera are sufficient

Analog/Digital Workflow

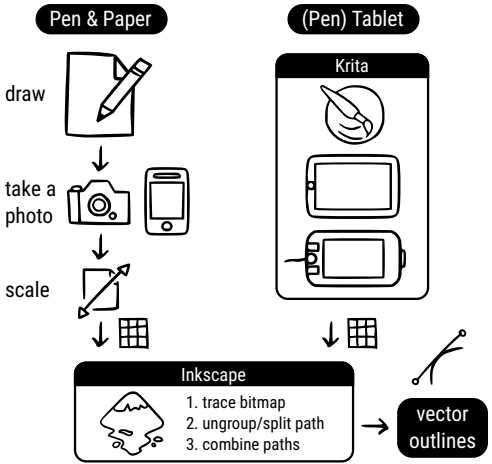


Figure: Overview of the analog/digital workflow

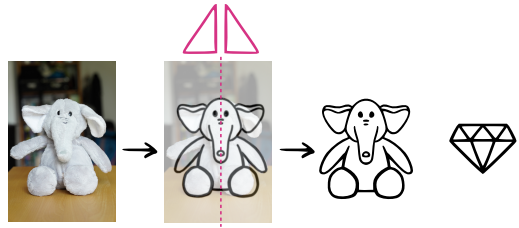


Figure: Tracing reference photos makes your life easier, as does the symmetry tool

Tip

Close shapes that will be filled with color!

Analog Workflow: Resize Photo

- Image > Scale Image to New Size. . .
- Otherwise there are many details in the resulting outline

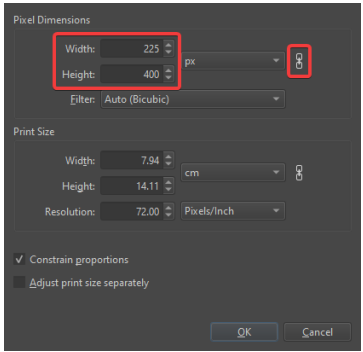


Figure: Reducing the image size

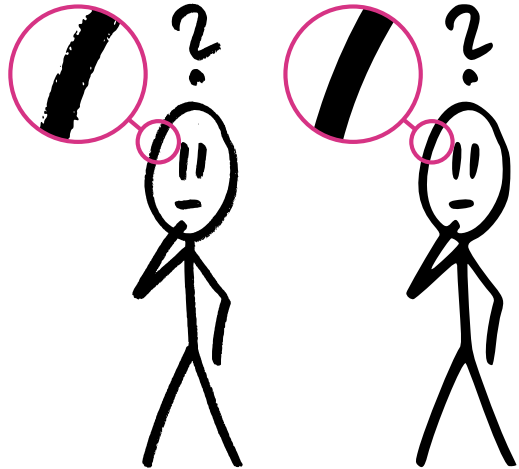


Figure: Outlines resulting from vectorizing a high-res and a low-res photo

Digital Workflow: New Document

- Low resolution for outlines (not for coloring)
- E.g., 1024 x 1024px for 5 x 5 small doodles/objects
- Optional: 8-bit grayscale color model saves disk space

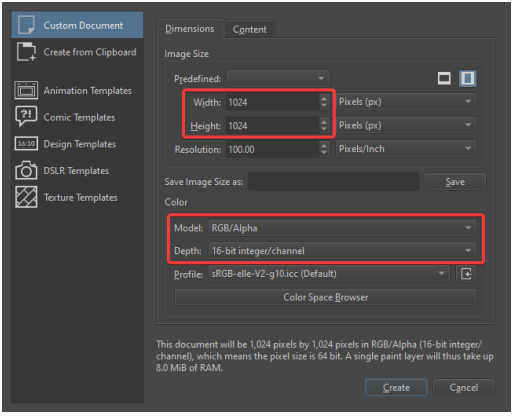


Figure: Krita's New File dialog

Digital Workflow: Brush Settings

- Preset: 5) Basic-5 Size
- Set Size to 10px
- Brush Editor
  - Deactivate Flow
  - Size > Pressure Curve
- Tool Settings: activate *Weighted* smoothing

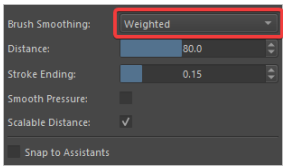


Figure: Brush Smoothing stabilizes strokes

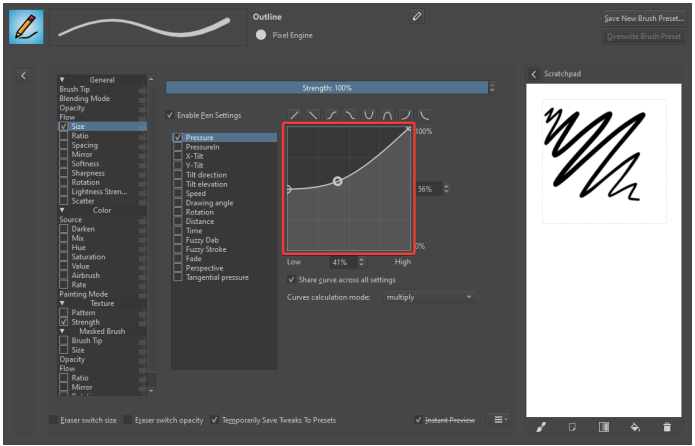


Figure: Adjust the minimum brush size

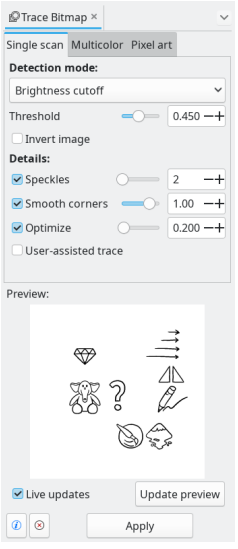
Vectorize Outlines

Outlines

1. Load outline image in Inkscape
2. Path > Trace Bitmap (default settings should be fine)
3. Click *Apply* and delete the original image
4. Path > Split Path (creates individual objects)
5. For each object
    1. Select all strokes of the object
    2. Path > Combine

You reached the first goal!

- Use the black-and-white outlines as-is, or
- Continue with coloring



Tips

Consistence

- Canvas size & brush (thickness)
- Projection
  - Flat (easiest, no depth information)
  - Isometric (more complicated)
  - Perspective (most complicated)
- Object size & proportions
- Amount of details
- One document for multiple/all objects

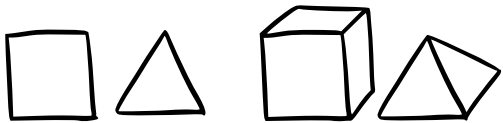


Figure: Shapes w/ and w/o depth information

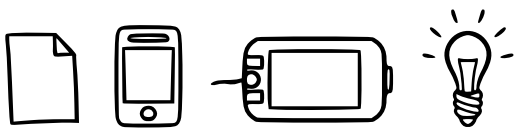


Figure: Draw multiple objects side by side

Krita: helper tools

- Horizontal/vertical symmetry
- `M`: mirror canvas
- Rulers, grid, reference images

Section 3

Color

Workflow

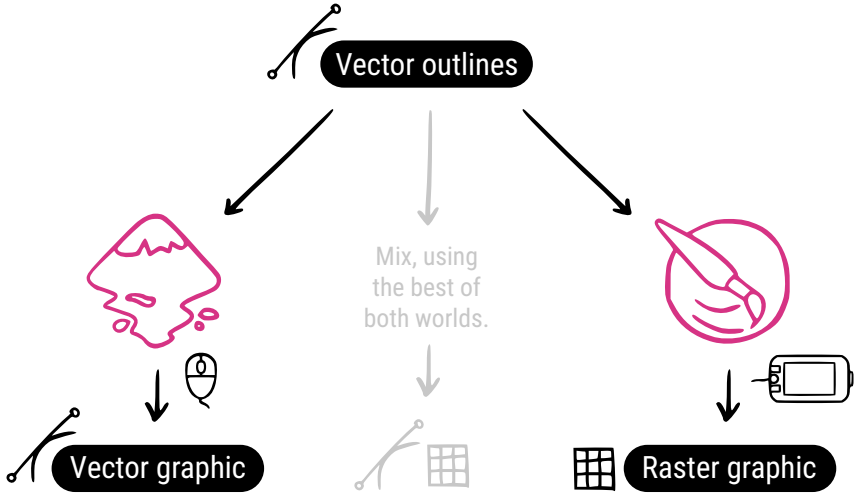


Figure: Both Inkscape and Krita can be used for coloring

Layers

1. Create two layers
   - Top: outlines (locked)
   - Bottom: base colors (unlocked)
2. Select the base colors layer

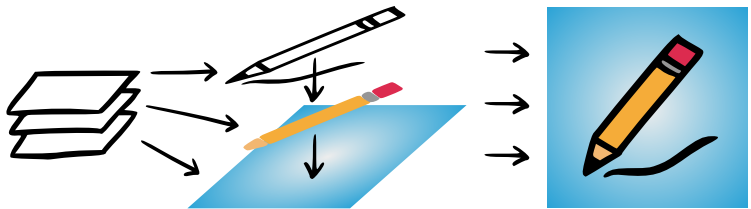


Figure: Layers stack sets of items on top of each other, e.g., outlines, base colors, and background

Layers

Inkscape

1. Layer > Layers and Objects...
2. Create two layers
3. Select all outline objects
4. RMB > Move to Layer...

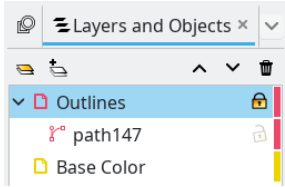


Figure: Inkscape layers stack

Krita

1. Settings > Dockers > Layers
2. Create base color layer

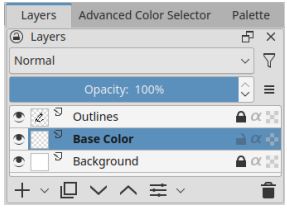


Figure: Krita layers stack

Fill Tool

Inkscape

- U: Fill bounded areas
- Tool settings
  - Grow/shrink
- Every path has a
  - Stroke color
  - Fill color
  - Object > Fill and Stroke...

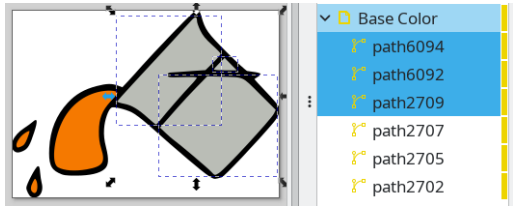


Figure: Combine paths with the same color (RMB > Select Same > Fill Color) for easier editing (Path > Combine)

Krita

- F: Fill continuous area/selection
- Tool settings
  - Grow
  - Reference

Color Palettes

- Fewer colors is “better”
- Prefer HSV color picker over RGB
  - **H**ue: position on color wheel
  - **S**aturation: intensity
  - **V**alue: brightness
- Resources
  - Color Hunt
  - Adobe Color

Consistency

- Use the same set of colors repeatedly
- Assign colors an intention

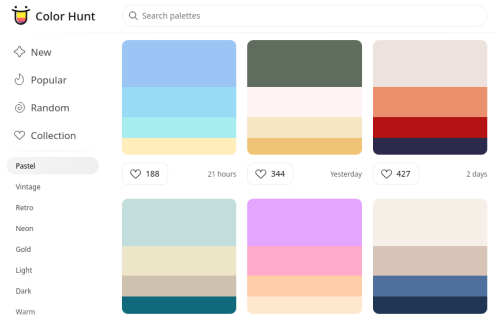


Figure: Color Hunt

Lighting

- Plain color looks very flat
- Shadows and highlights add depth to the drawing
- Personal impression
  - Shadows are most important
  - Highlights catch the eye
  - Both improve readability (e.g., separation)

Light

- From which direction does the light come from?
- Examples: from top, top-left, top-right, etc.
- Try to follow the light direction
- Does not need to be realistic

Paint Shadows and Highlights

Shadows

1. Create a new layer above base color
2. Paint with a dark, blue color (e.g., #5e6e87)
3. Set layer blend mode to *Multiply*
4. Reduce layer opacity as desired

Highlights

1. Create a new layer above shadows
2. Paint with a light, yellow color (e.g., #fcf5c3)
3. Set layer blend mode to *Screen*
4. Reduce layer opacity as desired

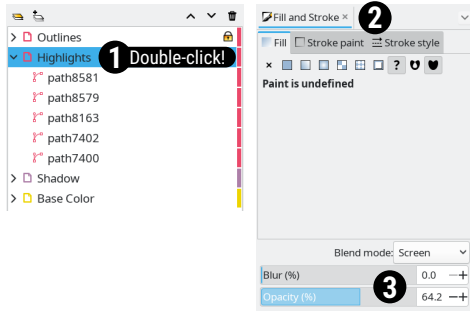


Figure: Setting the layer blend mode in Inkscape is hidden

Hints

Inkscape: Bezier Tool

- Use the Bezier tool for shadows and highlights
- Needs a bit of practice
- Can be used with a mouse easily

Krita: Alpha Lock

- Activate alpha lock for shadows and highlights layers
- Color is rendered only where the layer below is opaque
- Paint roughly without worrying about edges

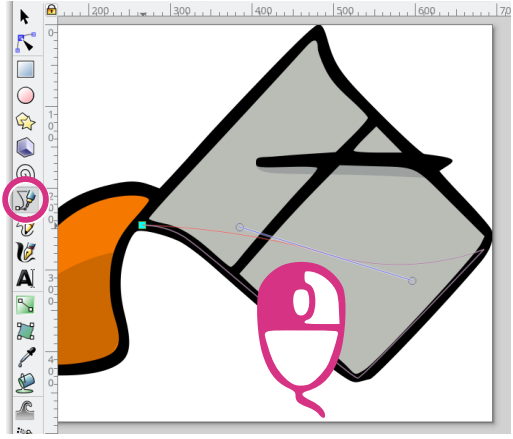


Figure: Draw shapes with the Bezier tool

Section 4

Tips & Tricks

Inkscape Export

Rasterize Vector Graphics

- File > Export
- Export the whole document or parts for a given resolution

Optimized SVG

- Inkscape SVG can contain sensitive data
- Optimized SVG (check the options!)
  - Strip metadata and Inkscape-specific data
  - File > Save a Copy... > Optimized SVG

PDF

- File > Save a Copy...
- For print, LaTeX documents, etc.

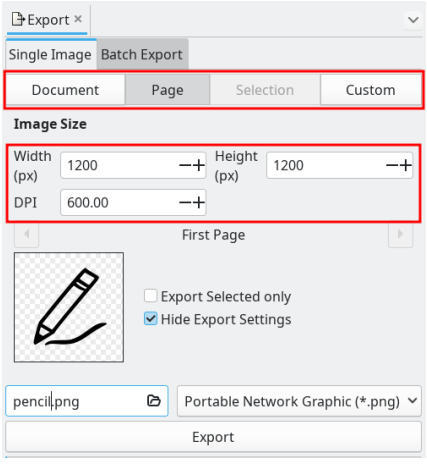


Figure: Inkscape PNG export

Automation Examples

Krita Export

```
krita in.kra --export --export-filename out.bmp
```

Vectorization

```
potrace -s -o in.bmp out.svg
```

Image Conversion

- `magick convert -density 300 in.svg out.png` (300 DPI)
- `magick convert in.jpg -resize x500 out.png` (height = 500, width is calculated automatically)

Next Steps

Explore Inkscape and Krita

- Add a colored background (e.g., on an extra layer below everything else)
- Add more details to the base color (e.g., scratches, dirt)
- Colorize outlines or selected strokes
- Experiment with gradients (e.g., for round objects)

Pro Tip: LaTeX Beamer slides

1. Write Markdown files and include your svg files: `![My image](image.svg)`
2. `pandoc --to beamer --slide-level=2 in.md -o out.pdf`
3. Have fun :-)

Hint: `rsvg-convert` must be installed for svg > pdf conversion