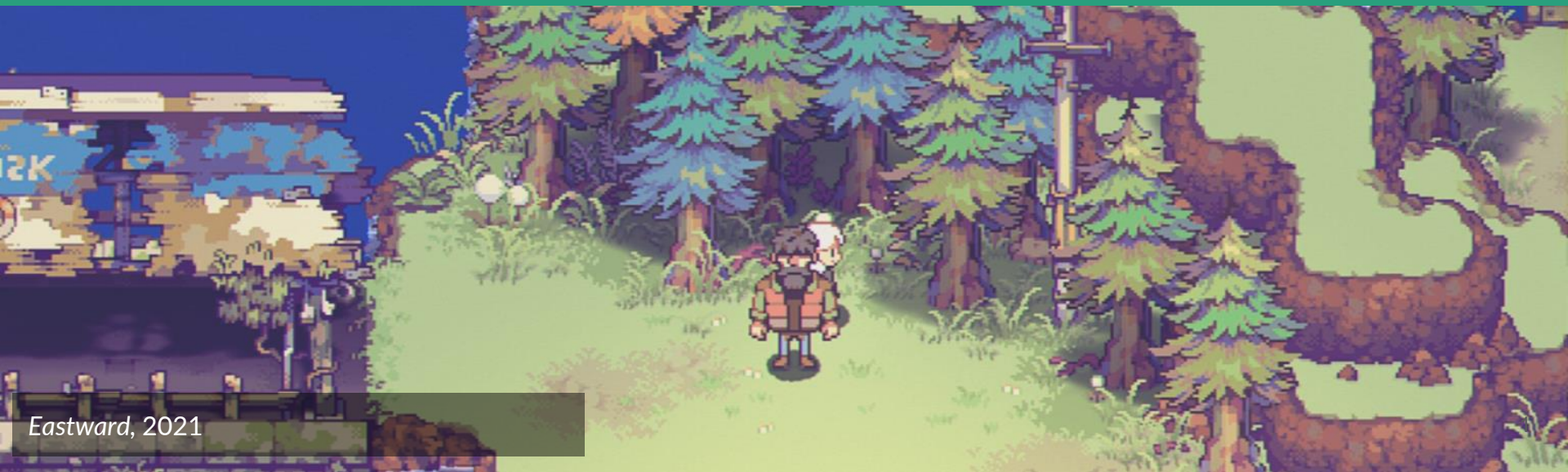


2

Pixel Art for

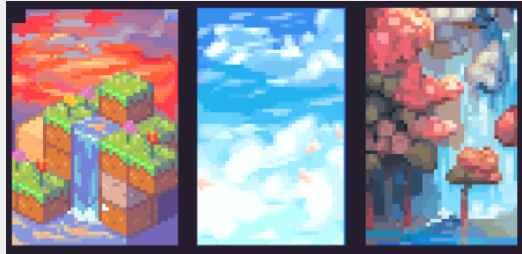
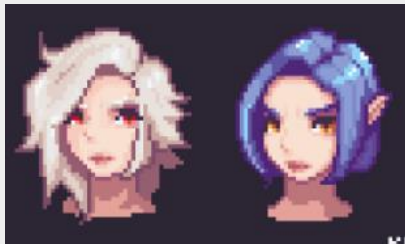
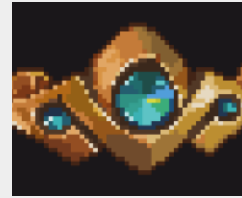
By Kira Fountain



Eastward, 2021

Me?

- Been doing pixel art for about 4 years, 1 year professionally for a Minecraft client + commissions
- Current undergrad student in Comp Sci & Comp Arts



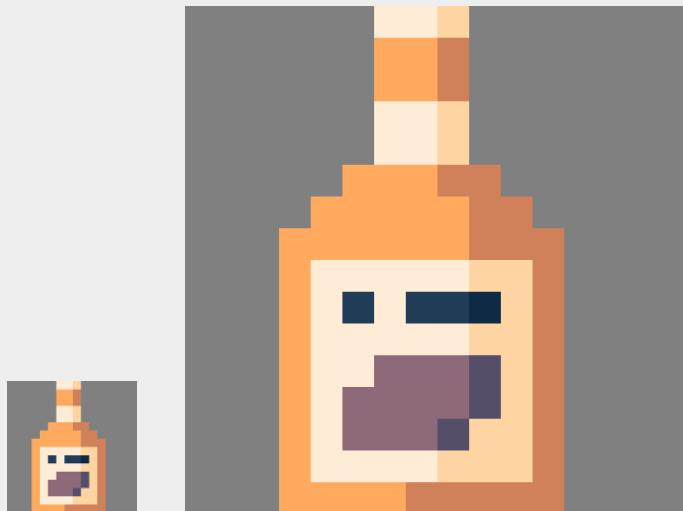
Session Agenda

0. Your work!

1. Exporting, file sizes, scaling
2. Common sprite sizes
3. Pixel perspectives
4. Managing your assets & spritesheets
5. Tilemaps
6. Importing sprite to game engine

YOUR WORK!

Your work - feedback



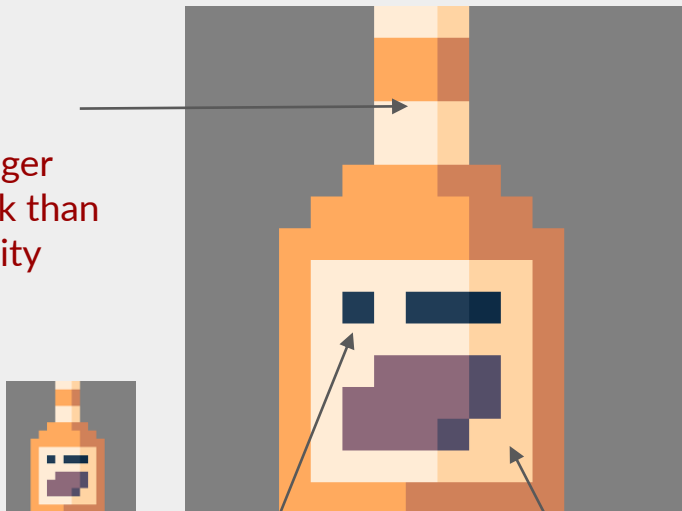
Ketchup bottle, 2023

SLS08 palette

- Good use of shading to convey roundness
- Very clean lines
- Careful placement of pixels as to avoid accidental faces
- Good symmetry, pixels were treated as important

Examine a reference

Longer
neck
than
reality



Text first, logo
below

Label does not
wrap around



Crucial highlight
that shows plastic
material, is missing

Your work - feedback



- Added darker tones in the corners
- Squashed the shape
- Added darker edges around middle logo
- AA'd text, used a less harsh tone
- Added crucial highlight
- Emphasized a bottle shape with shading

Your work - feedback



Coffee mug, 2023

SLS08 palette

- Nice job of taking advantage of the full range of the palette
- A careful job of applying concepts learned like anti-aliasing and clean lines (no jaggies)

Your work - feedback



- Touched up the perspective
- Cleaned up the transition, less AA
 - Too much AA can appear messy and muddled
 - Same for the orange
- Mug shape should be more even, so I made it more symmetrical
- Touched up handed (but still needs work lol, a tricky perspective)

Your work - feedback



- Nice outline
- Good effort trying some dithering
- Shape is good

Crockpot, 2023

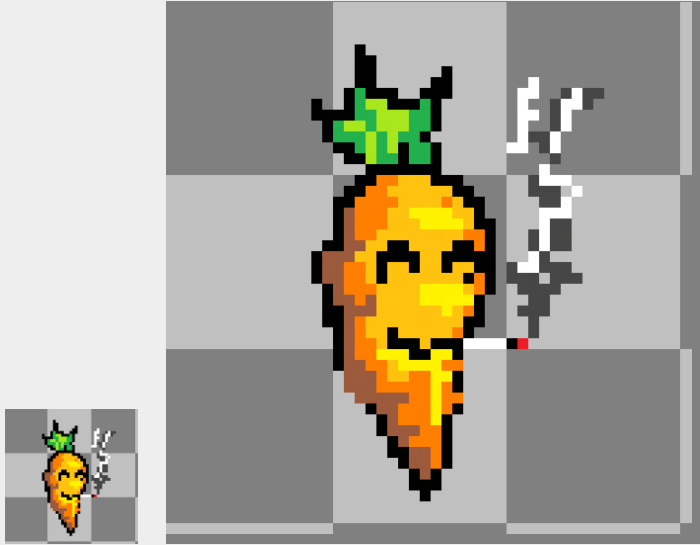
SLS08 palette

Your work - feedback



- Added shading in the outline as well
- Took away dithering
- Cleaned up outline
- Added shading/highlights

Your work - feedback



Smoking Carrot, 2023

Custom colours

- Colours are looking great!
- Good use of hue shifting
- Some indents for the shape of a carrot are good
- A creative idea

Your work - feedback



- Fixed the jaggies
- More exaggerated hue shifting, fixed colours a bit
- Defined facial features more
- Changed black outline to dark red
- Cleaned up smoke
- Added heavier anti AA since it's a bigger piece
- Transparencies?

Exporting & scaling

Sprite sizes & scaling

Pixel art should generally be done in a **power of 2**

$$2^4 = 16\text{px}$$

$$2^5 = 32\text{px}$$

$$2^6 = 64\text{px}$$

...

$$2^{10} = 1024\text{px}$$

Optimized textures, to
the power of 2

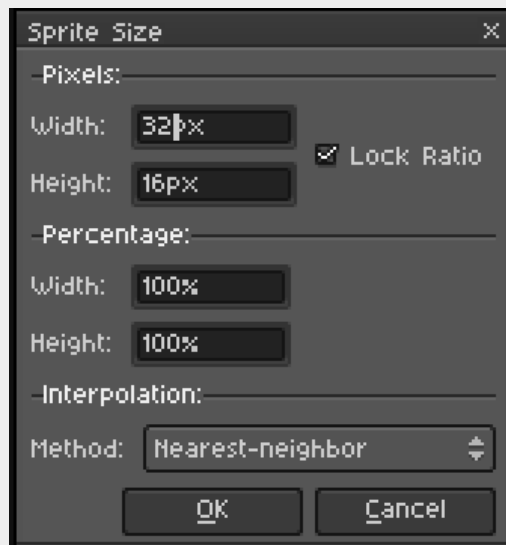


In red, the area the texture
should be occupying but
isn't, causing the engine to
have to scale up or down

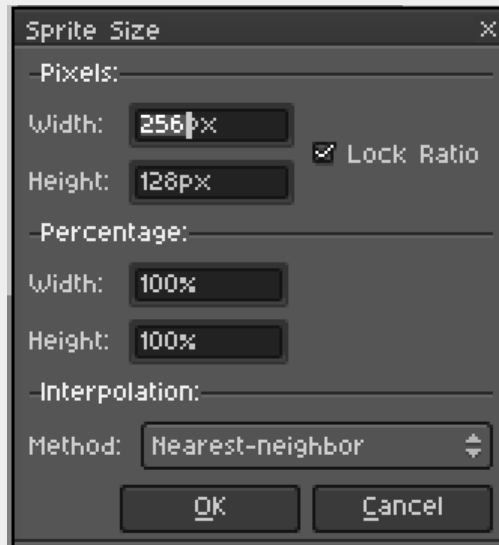
- Can cause blurriness, artifacts, sometimes corrupted in-game

Sprite sizes & scaling

- Makes it easier when you are trying to scale up or down later, no issues or losses



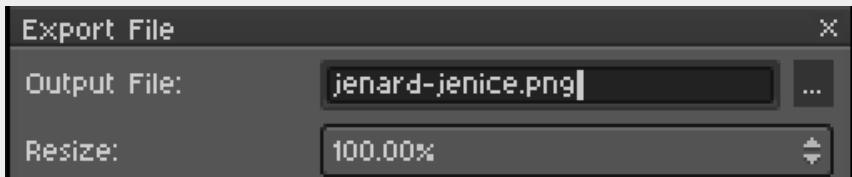
8x



Exporting for games - best practice

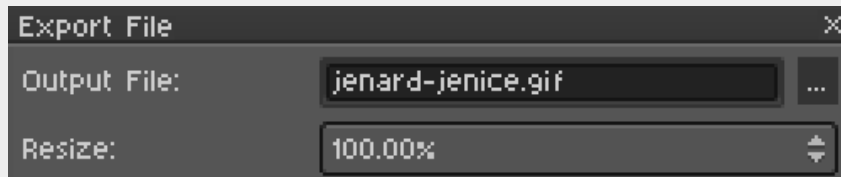
Static

- Always **PNG**
- Transparent background
- Power of 2
- Scale size, percentage a good number OR scale 100%



Animated

- Always **GIF** (unless frame sheet)
- Transparent background
- Frames aligned
- Power of 2
- Scale size, percentage a good number OR scale 100%



Sprite sizes

First – establish a screen size



1920x1080

The most common ratio for most screens if you want the full-screen effect

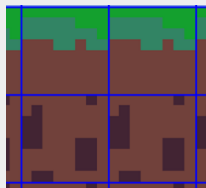
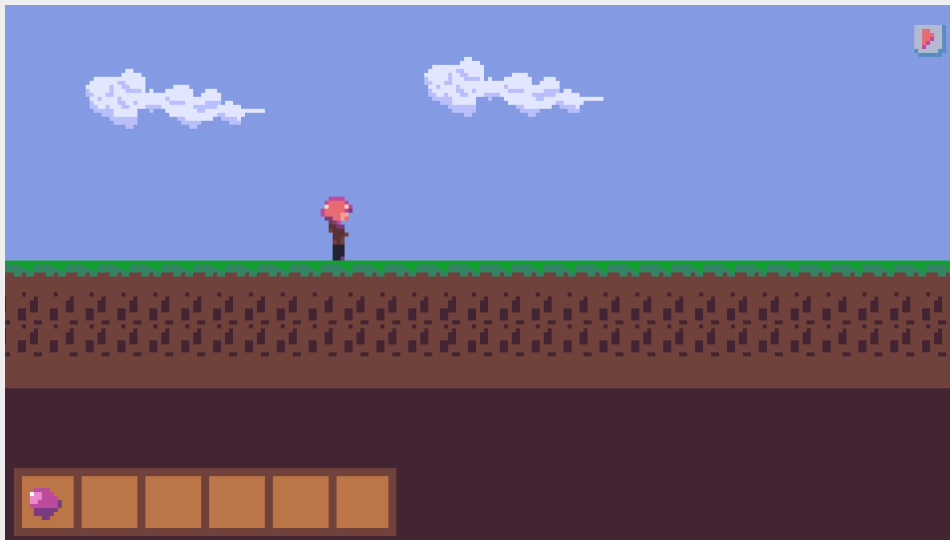
Choose a scale:

- 640 x 360px (3x smaller)
- 480 x 270px (4x smaller)
- 320 x 180px (6x smaller)
- 240 x 135px (8x smaller)

REMEMBER:

Your scale does not need to be a power of 2. It just needs to be the same ratio as your screen size, in this case: 16:9

Small: 240 x 135px



8x

240 x 135px

Character: 16x

Inventory Item: 16x

Tileset: 8x

Button: 8x

8 times smaller than screen size

OVERALL: Very small, could be what you are looking for but hard to work with. Too small for most projects.

Medium: 320 x 180px



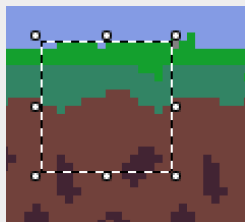
320 x 180px

Character: 32x

Inventory Item: 16x

Tileset: 16x

Button: 16x

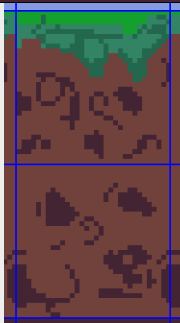


16x

6 times smaller than screen size

OVERALL: A small amount of pixels to work with, good for a retro style. Ideal balance for a game jam.

Large: 480 x 270px



32x

480 x 270px

Character: 64x or 32x

Inventory Item: 32x

Tileset: 32x

Button: 32x

4 times smaller than screen size

OVERALL: A flexible size that allows for lots of detail. The art will take a long time, especially animations.

Extra large: 640 x 360px



I didn't want to draw it myself for the sake of time but here's an example of this size.

640 x 360px

Character: ~32x

Tileset: N/A

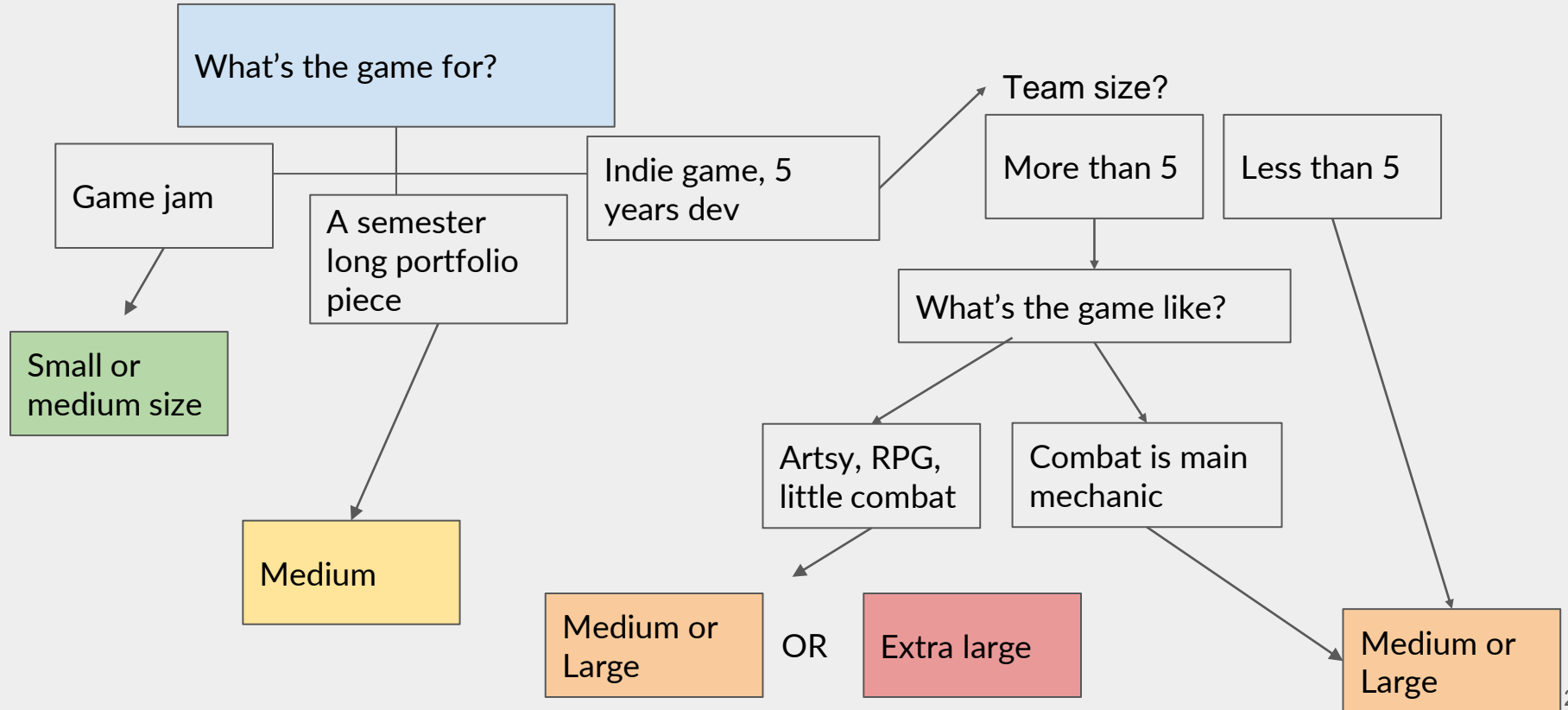
Health bar: 32x

Tree: ~128-256 px

3 times smaller than screen size

OVERALL: A very big size, while its beautiful, not recommended unless you have a big team – you won't ship any games like this on your own. Not the best for combat-centric games.

Which to choose?



Character sizes

The size of your character depends on:

- The scale of your screen size
- Physical attributes of the character
- If the game is combat heavy or no
- The style you want to convey

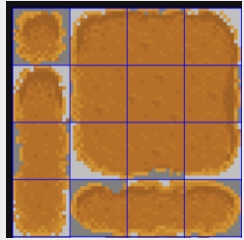
PRO: Lots of detail

CON: Will be very difficult to animate



More pixels = more time (more pain)

Stardew Valley - an accessible reference



16px



32px



16px

32px



256px



16px

32px



64px without
frame

144px

Undertale - an odd reference



29px

19px



30px

32px



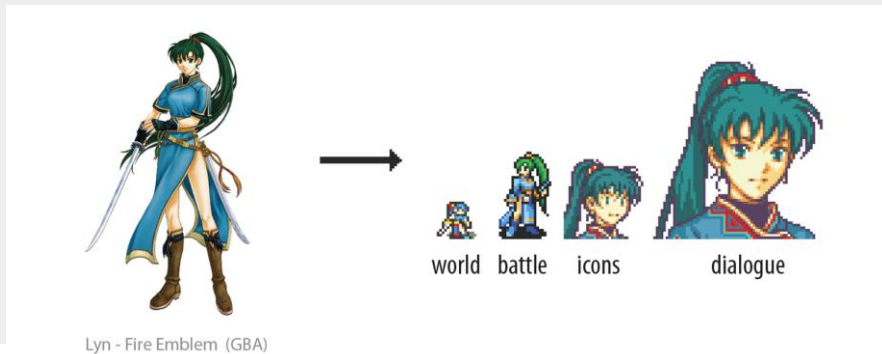
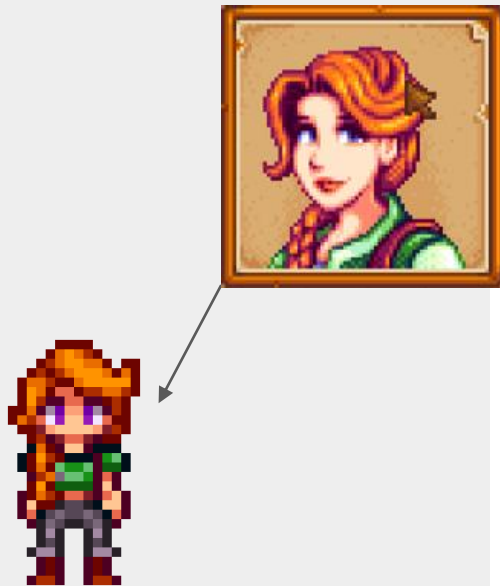
102px

72px

Sprite sizes are not in a power of two, not optimized, no rules really – not recommended but it works technically

Character sizes

You may also want to intentionally create sprites of varying sizes for use in different parts of the game



Pixel perspectives

Pixel art perspectives

- Various perspectives in 2D games
- Some are better for certain gameplay than others
- Pseudo 3D perspectives: they imply length, width and depth but are really just 2D
- **Perspective:** how the world looks, viewed by the human eye.
 - The closer something is, the bigger it looks
 - Very important in art and illustration
- **Orthographic:** flat views with no perspective (most used in pixel art games)

Orthographic views: Side view



- Very common, shows only one side of an object, building, person etc.
- Ideal for single direction games, corridor style
- Not as effective for open world, but good for combat
- Popular games that use this:



Shovel Knight, 2014

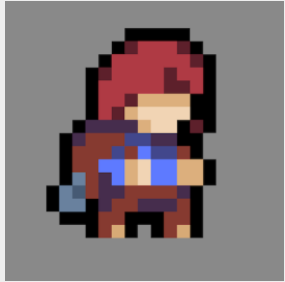
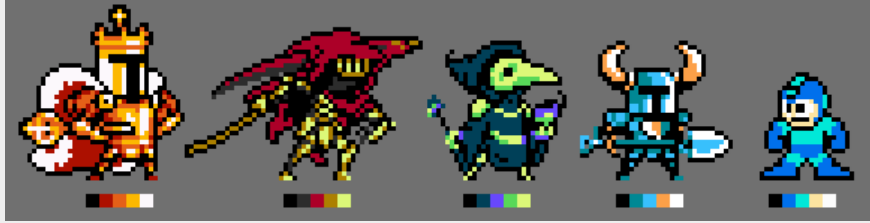
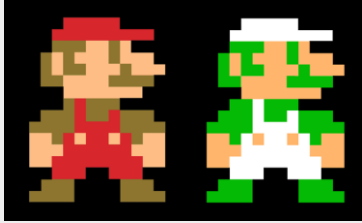


Celeste, 2018



Backbone, 2021

Orthographic views: Side view



Orthographic views: Top-down

- Very common, shows top and front
- Good for open world and exploration, can be awkward with combat if not done right
- Can be difficult to create accurately
- Allows for more detail and hidden secrets



Stardew Valley, 2016



Eastward, 2021



Hyperlight Drifter, 2016

Orthographic views: Top-down



Orthographic views: Top-down

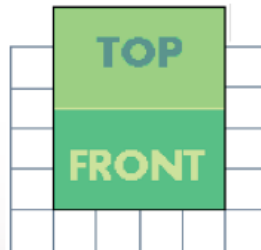
- Top down doesn't mean the same for every game, do what works best for you
- I prefer FRONT = TOP



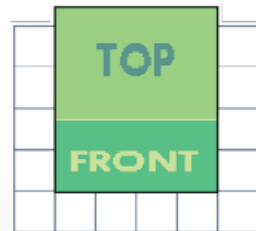
Front > Top
for Beat em' ups.



Front \approx Top
Common view.



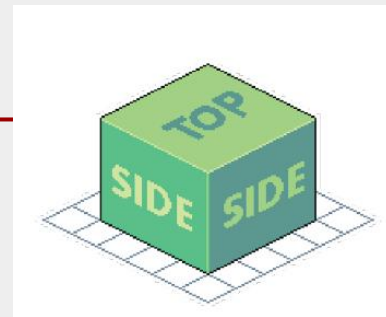
Front = Top
Easy for tile sets.



Top > Front
Good for altitude.

Paraline views: Isometric

- Not used in games typically because its unconventional for combat and difficult to code
- Good for exploration, shows all three dimensions (paraline)
- Tricky to get certain things looking right



Witchbrook, Coming soon

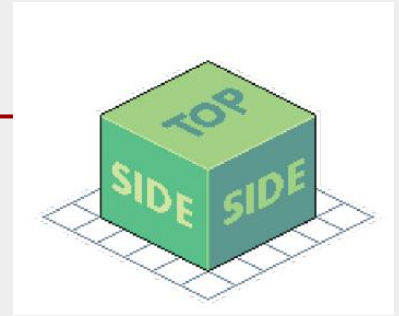


Final Fantasy Tactics Advance,
2003



Harry Potter 1, GBA, 2016

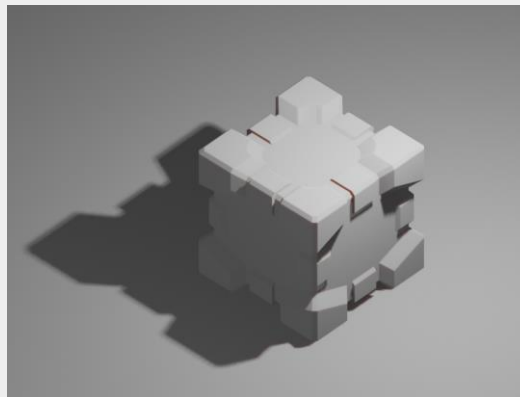
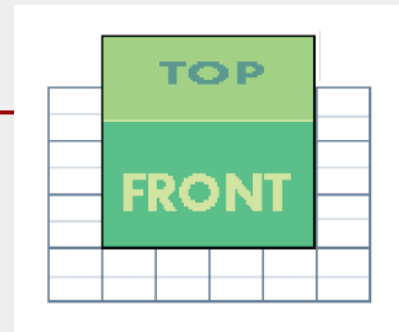
Paraline views: Isometric



Top down - How to draw?

1. Look at reference ALWAYS
 - Little real life references, but plenty of pixel art is done in this style
 - Stardew Valley is entirely done in top down, lots of reference for how things should look perspective wise
2. Create your own reference using a 3D modelling program like Blender to see how something should look

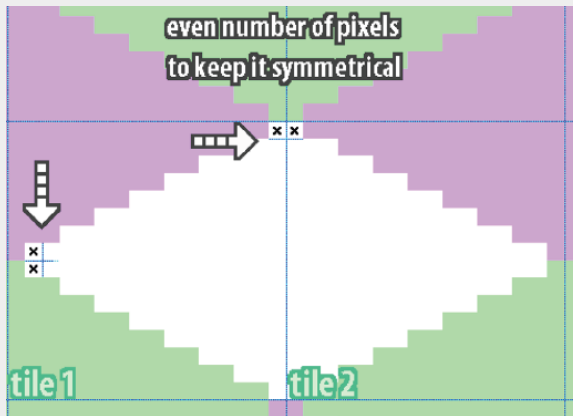
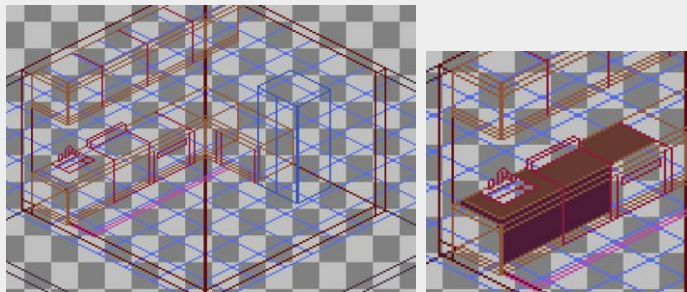
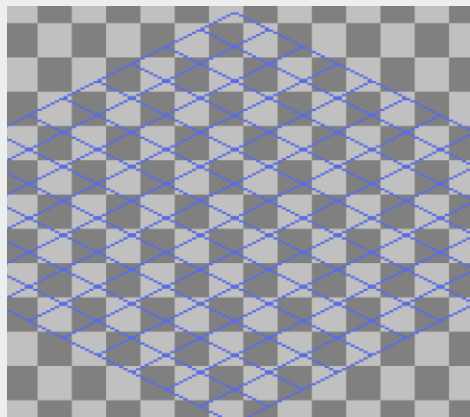
[Spriter's Resource](#)



CGD
cube :)

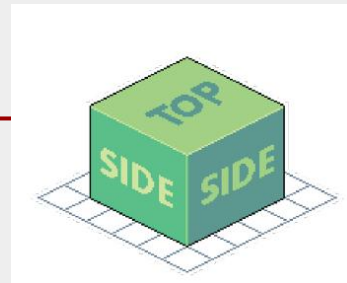
Isometric - How to draw?

1. Set up your pixel art editor with a diamond layer + low opacity



Create your own

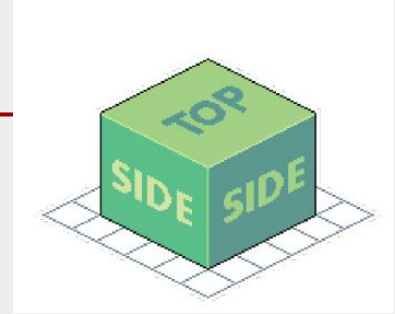
ALWAYS USE A GUIDE



Isometric - How to draw?

Need a reference?

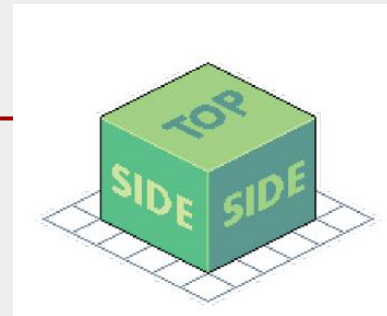
- For interiors: Open the Sims 4 (free), go into build mode, take a screenshot
- OR their promotions/other user-generated content is good



Not perfectly isometric
but a good visual
starting point

Orthographic views: Top view

- Used to be popular in the early 2010s but not so much today
- Favoured for stealth, strategy or combat when you need to see a “map view” of the area
 - Not great for a majority of games, especially RPGs
- Art consists of mainly tilesets, characters are simple - good for game jams



Monaco, 2013

(Not pixel art but still)



Hotline Miami, 2012



Endoparasitic, 2022

Other perspectives

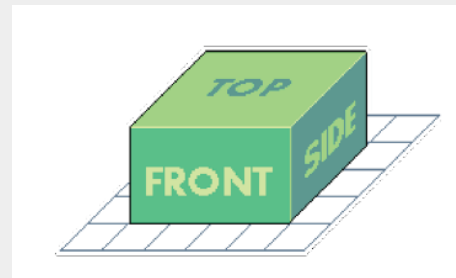
There are others of course but they are less used



45 degree dimetric view



Oblique



True perspective

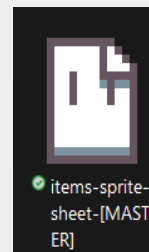
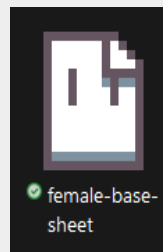
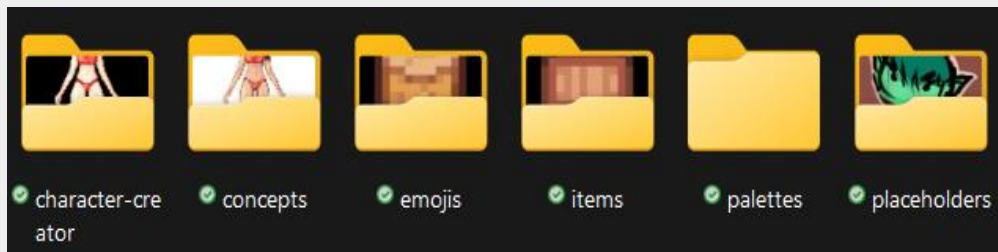
Managing your assets

Managing your assets

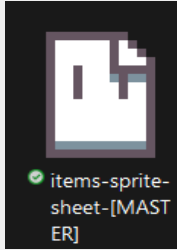
A game has a TON of art assets, and for pixel art especially its a lot of little pieces that could get lost in unorganization – so it's important to keep it together

1. Create one big folder for all your art for a specific project

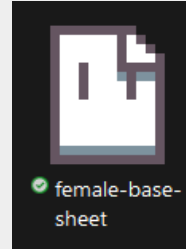
How I do it for a game project:



Managing your assets



Items Master sprite sheet



Female base sprite sheet

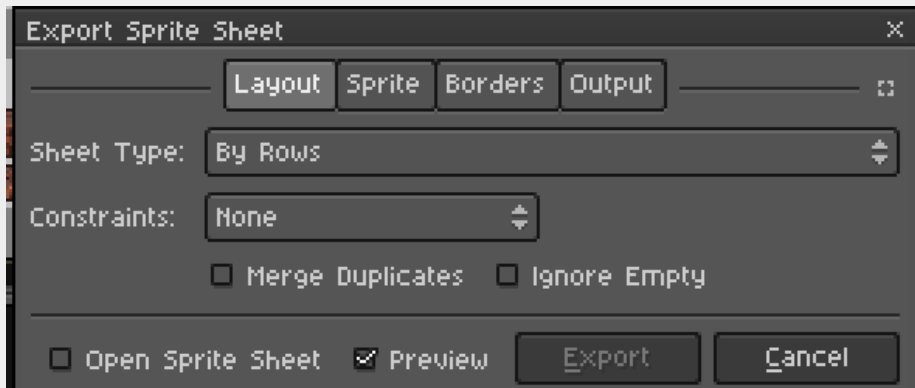


Managing your assets

2. ALWAYS use sprite sheets when working on a game, they are useful because:

- You can easily keep track of all the sprites that have been made
- If you're using a palette, you can easily pick up those colours
- Remember your style, compare to other assets for consistency
- Prevents mistakes or accidental deletions, losing files

and....



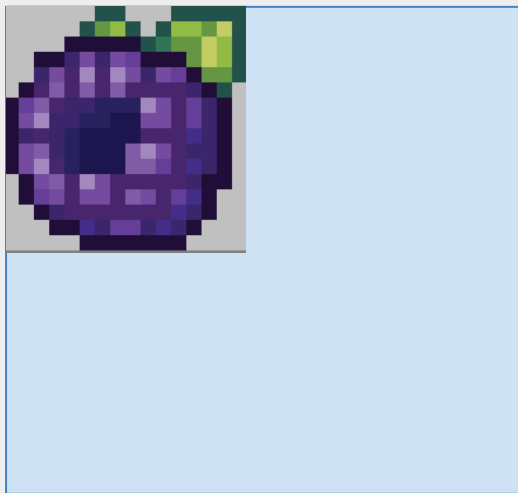
Aseprite has an “Export Sprite Sheet” function so you can export your hundreds of items at once!

What are sprite sheets exactly?

Sprite sheets are just a way to optimize memory usage in games and loading assets, and they are almost always used in pixel art games

This is why:

76 KB



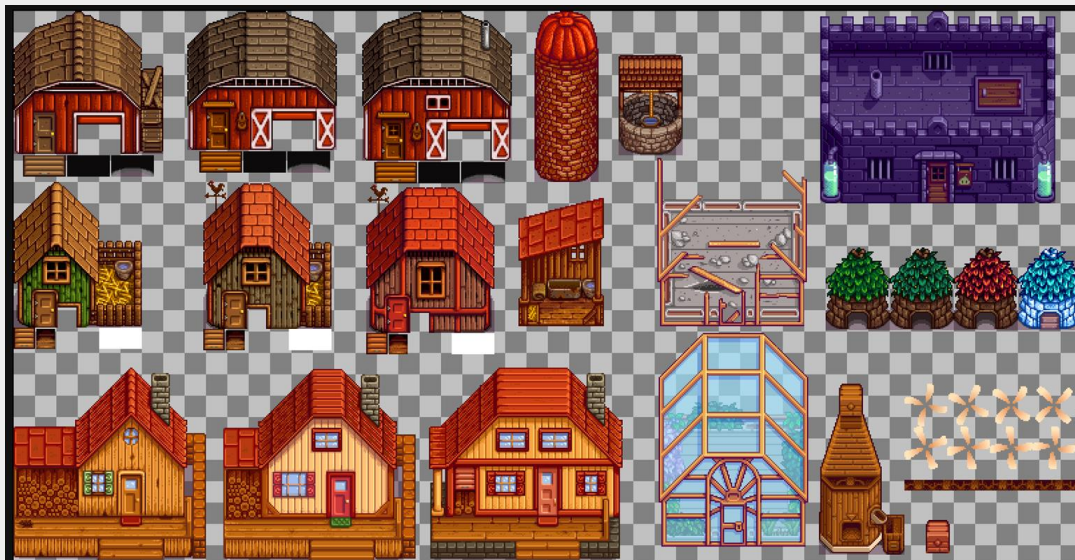
76 KB



How should I set up my sprite sheet?

Sprite sheets don't have to be a certain way, size or format – when you import it into the game engine, you can set the rules for what is a sprite

- This can be automatic or by hand, just try to leave as much space out as possible, so it's nice and compact



Tilesets/tilemaps

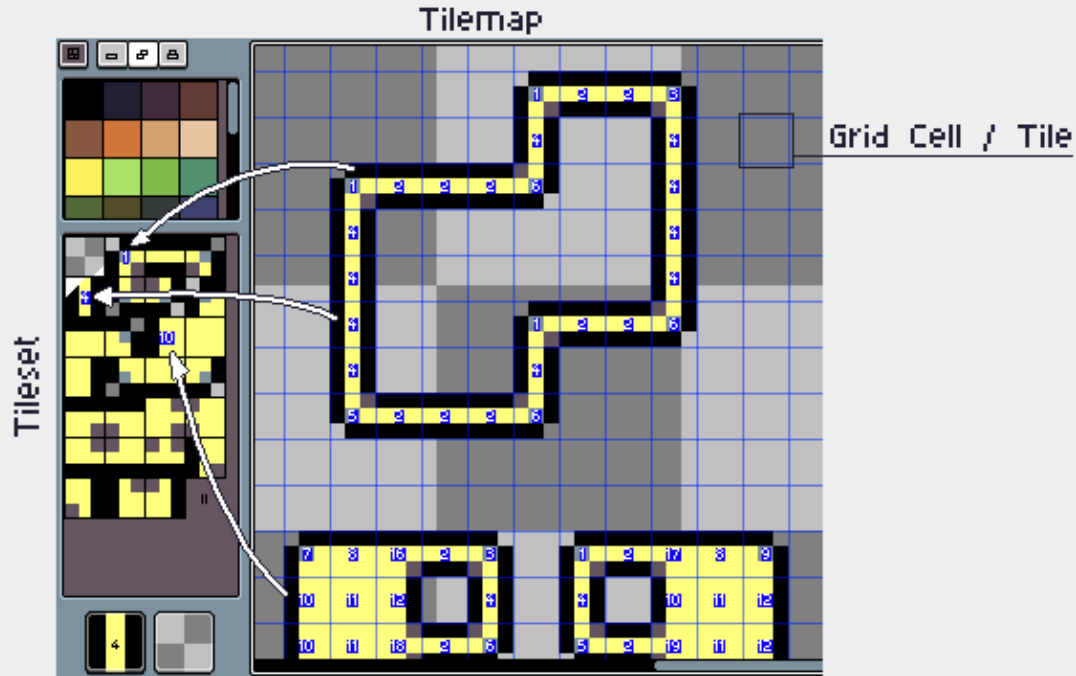
What?



Tilesets / tilemaps

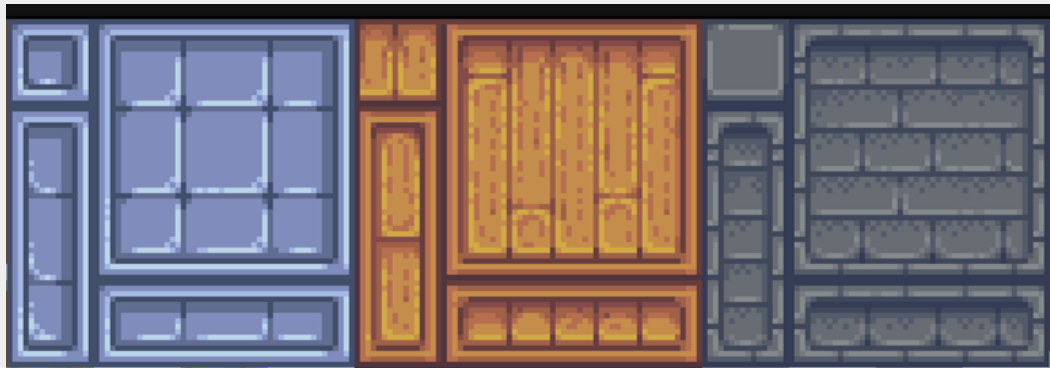
Tilesets: a collection of tiles, of the same size

Tilemap: a mapping or placement of tiles from a given tileset



How to make a tileset?

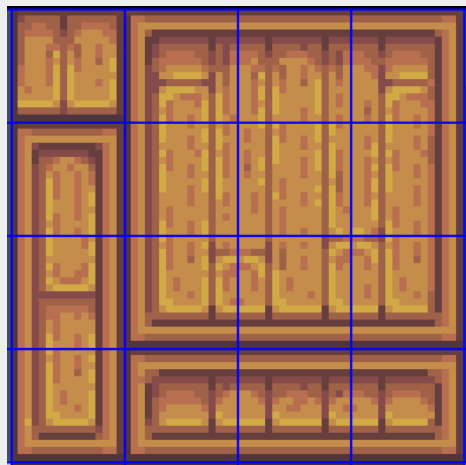
Once again we will turn to *Stardew Valley*:



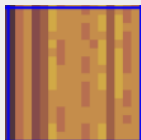
Here are three different tilesets, but they all comprise of basically the same thing

Each tile is 16x

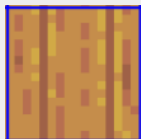
How to make a tilemap?



1: corner piece



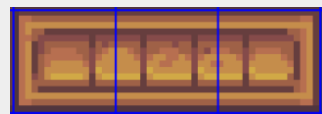
2: side piece



3: middle piece



5: vertical single tiles



4: horizontal single tiles



6: single tiles

Note: Here, Barone added variety by making all edge pieces and corner pieces different, totalling to 9 original tiles, but you don't have to do that. For a game jam, only make 3 original tiles then copy, paste and flip/rotate them.

TOTAL: 16 tiles in this tileset

Importing sprite to game engine

Importing sprite sheets to game engines

- Importing differs from engine to engine, but it's usually the same principle
- You can place tiles by hand, or set up auto-tiling in certain engines (like Godot
- I don't know if we'll have time to go over it in depth but here are some resources that helped me:



UNITY: <https://www.youtube.com/watch?v=aaEEujLtsr8>



GODOT: <https://www.youtube.com/watch?v=0713nIQxU7I>

Aseprite tour

Resources

1. *Pixel Logic* book by Michafrar
 - a. Last updated 9 months ago
 - b. English or French<https://michafrar.gumroad.com/l/pixel-logic>

1. Saint11 tutorials
<https://saint11.org/blog/pixel-art-tutorials/>

1. Pixel Art Discord (*Hit or miss*)
<https://discord.gg/pixelart>

1. Twitter #pixelart
 - a. A good way to follow other artists and study their work

NEW

5. Pixel Dailies
<https://discord.gg/6MY8Jrq2>
https://twitter.com/Pixel_Dailies

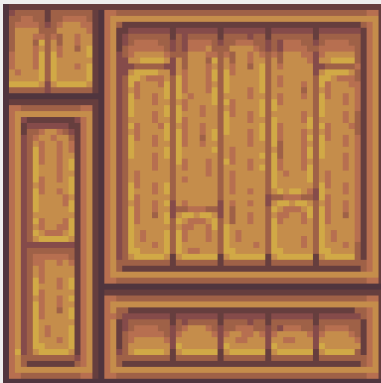
NEW

6. The Spriter's Resource
<https://www.sprisers-resource.com>

Try it yourself! Practice makes good art, no “talent” needed

Challenge #3

Tileset Base



Modify or make your own tileset based on this one from Stardew Valley. Bonus if you're able to use it in-engine!

Challenge #2

Create a top down furniture item!

💡 Ideas:

- Barrel
- Box
- Wooden chair
- Table
- Bookcase

I'll send a Google Form in the Discord for next time so you can anonymously submit your art and I'll critique it in next session!