






Interactive Media and Game Development

Tiles, Sprites and Concept Art


Tiles



- A tile is a small, square 2d image for a sprite-based game
 - Needed for commonly backgrounds
- Often repeated
 - Too hard to make every pixel different!
- RPGs make heavy use
 - Grass, trees, water, sand
- Similar to repeating textures in 3D game
- Start with a grass tile to warm up

Grass is Green


- Use a basic green square
- But looks unnatural
 - Like flat, shiny metal
- No illusion of movement




SIMPLY A GREEN
BOX WITH LIGHTER
GREEN DOTS.

Grass has Variation



- Can do a lot with simple enhancement of color shades


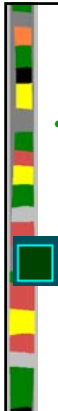

SIMPLY A GREEN
BOX WITH LIGHTER
GREEN DOTS.

Make Random




- Use the "spray" tool


 → 
3 GREEN SHADES RANDOMLY
"SPRAYED" AND A 16x16
CHUNK TAKEN FROM IT.

Make Look Random with Control

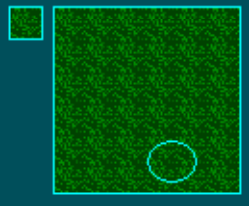

- Draw by hand for more control
 - 4 pixel line strokes

 →  → 
BUILDING UP "STRANDS" FROM
THE 3 SHADES OF GREEN TO GET
A "DIRECTION" FLOW.



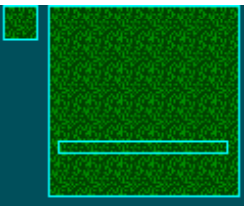

The "Grid" (1 of 3)

- Looks too much like tiles
- "Large" blank is problem, so remove

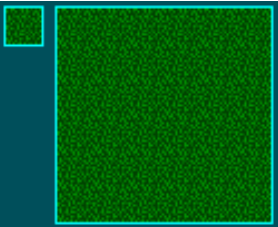

The "Grid" (2 of 3)

- Still, some "lines" are visible when repeated
- Break up with more color

The "Grid" (3 of 3)

- Much better!

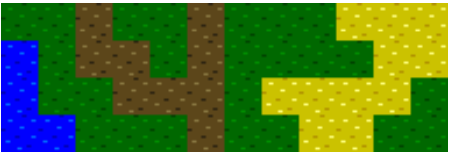




Don't Try This at Home

- Don't use same texture for all, else not much better than just colors





When the Rubber Hits the Road?


Outline

- Tiles (done)
- Sprites (next)
- Concept Art



Animation

- Animation → produces the illusion of movement
- Display a series of frames with small differences between them
- Done in rapid succession, eye blends to get motion
- Unit is Frames Per Second (fps). For video:
 - 24-30 fps: full-motion (Game Maker does 30)
 - 15 fps: full-motion approximation
 - 7 fps: choppy
 - 3 fps: very choppy
 - Less than 3 fps: slide show
 (2D Sprites can get away with about about $\frac{1}{2}$ the above)
- To do successfully, need to keenly observe, focus on differences in movement
 - Apply basic principles (next)



Key Frames





FIGURE 9.3
Key-frame Example

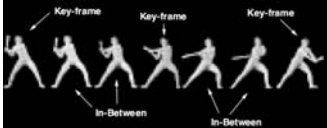
- Images at extremes in movement
 - Most noticeable to observer
 - Ex: for flight wings up and wings down
 - Ex: for walking, right leg forward, leg together
- The more the better?
 - Smoother, yes
 - But more time to develop (tradeoffs)
 - And more prone to errors, "bugs" that interfere with the animation




Based on Chapter 9, *Designing Arcade Computer Game Graphics*, by Ari Feldman

In-Between Frames

- Generated to get smooth motion between key-frames
 - Can be tedious and time consuming to make
 - Most software allows duplication




Based on Chapter 9, *Designing Arcade Computer Game Graphics*, by Ari Feldman



Frame Animation Guidelines

Object	Minimum # of Frames	Maximum #
4-legged animal running	4	16
Animal biting	2	5
Crawling	2	12
Explosions	5	16
Falling	3	5
Flying	2	12
Jumping	2	10
Kicking	2	6
Punching	2	6
Rotating/spinning	4	16
Raining	2	12
Swinging (an object)	2	8
Throwing (an object)	2	6
Vehicle flying	2	4
Vehicle moving	2	8
Walking	2	12

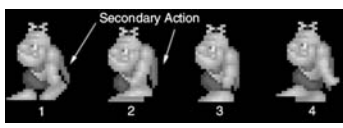
(See GameMaker tutorial shooter for examples of Enemy Planes, Explosions)




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Secondary Actions

- Animation part that does not lead movement, but follows it
 - Add extra dimension of reality
 - Ex: Hair moving in wind
 - Ex: Cape billowing backward




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Steps in Creating Animation Sequences (1 of 3)

- Conceptualize - have vision (in mind or on paper) of what animation will look like
- Decide on object behavior
 1. Animated once (no looping)
 2. Animated continuously (using cycles)
 - 2nd choice means must make last key frame blend with first
- Choose an image size - will contain and constrain object
 - Test and experiment briefly to have plenty of room
- Design key-frames - drawing the motion extremes
 - Use simple shapes to represent main actions
 - Ex: stick figures or basic shapes (circles, squares)



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Steps in Creating Animation Sequences (2 of 3)

- Estimate the in-betweens - think of how many you will need to complete the sequence smoothly
 - Be conservative. Easier to add additional transition frames than remove them
- Apply secondary enhancements - Embellish to look convincing and enticing

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Steps in Creating Animation Sequences (3 of 3)

- Test each movement
 - Can be done with 'copy' and 'undo' in tool
 - Others have animation rendering (ex- Game Maker)
 - Look for flaws (movement, discolored pixels ...)
- Repeat - Repeat for all animations

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Outline

- Tiles (done)
- Sprites (done)
- Concept Art (next)



Why Not Just Prototype?

- Even creating prototypes can be time consuming and expensive
- Getting it right on the first try is unlikely
- Revising instantiated work can be difficult

Thus the need for some **forethought!**

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What is a Better Way?

Make decisions on paper, where changes and variations can be made quickly and easily.



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Who Is Involved?

We can think of the process as a two-part system:



The BOSS supplies the constraints that the drawing needs to fill.



The ARTIST generates drawings based on the given constraints.

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The BOSS (1 of 3)

- Takes part in a higher-level design process with goals of its own

Attract web-goers

Sell more widgets


Win an Oscar




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The BOSS (2 of 3)

- Communicates constraints inherited from this higher-level process to the ARTIST



Happy Purple Dinosaur



We need a happy, purple dinosaur to sell more widgets!

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The BOSS (3 of 3)

- Evaluates the fitness of the ARTIST's solutions based on various heuristics

Market research says its good

Wife likes it

Magic 8-Ball says outlook not so good





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The ARTIST (1 of 4)

- Generates drawings based on the given constraints

We need a happy, purple dinosaur to sell more widgets!







Happy Purple Dinosaur

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The ARTIST (2 of 4)

- Has expert knowledge of drawing materials and techniques







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The ARTIST (3 of 4)

- Has aesthetic heuristics (acquired by studying style, design and master artwork)

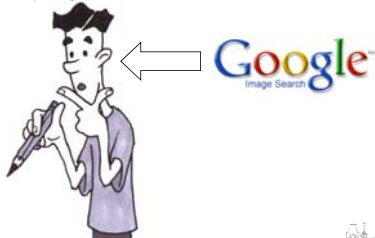




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The ARTIST (4 of 4)

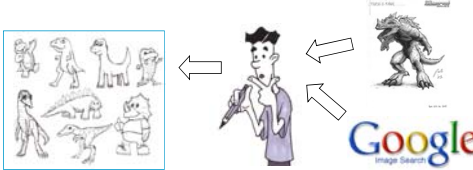
- May need to cache domain-specific knowledge (dinosaur anatomy, typical dress of a noblewoman in 13th century England, etc.)



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Beginning with Thumbnails (1 of 2)


- The exploration of possible solutions often begins with ARTIST generating rough drawings.
- These rough drawings - called "thumbnails" - are often little more than suggestive scribbles.
- Thumbnails can be generated very rapidly. This allows ARTIST to generate many points of search space at little cost.



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Beginning with Thumbnails (2 of 2)

I like the one with the sunglasses. Let's see where we can go with that!



Thumbnails enable ARTIST and BOSS to quickly get their bearings and identify fruitful starting-points for exploration.

These rough drawings can quickly expose problems with the given constraints.

It doesn't take highly detailed concepts to cull large portions of search space!


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Drawing the Concept (1 of 5)

There are many techniques for creating more detailed concepts (pencils, markers, watercolors, etc.)

In general, the drawing process is one of iterative refinement.

For example, when rendering a concept with markers, the ARTIST will begin by **roughly sketching** most of the detail with a light marker.




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Drawing the Concept (2 of 5)

Next, the ARTIST does some **line selection**.

In this stage, the ARTIST is choosing the best of the rough details for inclusion in the final concept.


The ARTIST may also be adding some lower-level details as well, now that the higher-level details are becoming more specific.



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Drawing the Concept (3 of 5)


Next, the ARTIST does some **region coloring** to separate the different elements of the drawing ...



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Drawing the Concept (4 of 5)

... and now a **shading pass** to reveal the 3D form of the concept ...




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Drawing the Concept (5 of 5)

... and finally a **detail pass**, picking out lines to reinforce and areas to highlight.

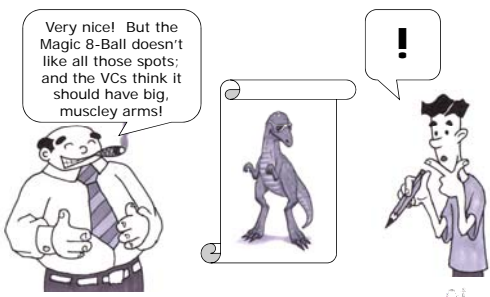
This concept is finished ... but wait!



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Back to the Drawing Board!

Very nice! But the Magic 8-Ball doesn't like all those spots; and the VCs think it should have big, muscley arms!



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Questions and Discussion



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