IMGD 1001:
2D Art

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Outline

- The Pipeline

- Concept Art

- 2D Art   (next)
  - Animation, Tiles

- 3D Art
  - Modeling, Texturing, Lighting

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 ½ the above)
- To do successfully, need to keenly observe, focus on differences in movement
  - Apply basic principles (next)

Key Frames

- 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)
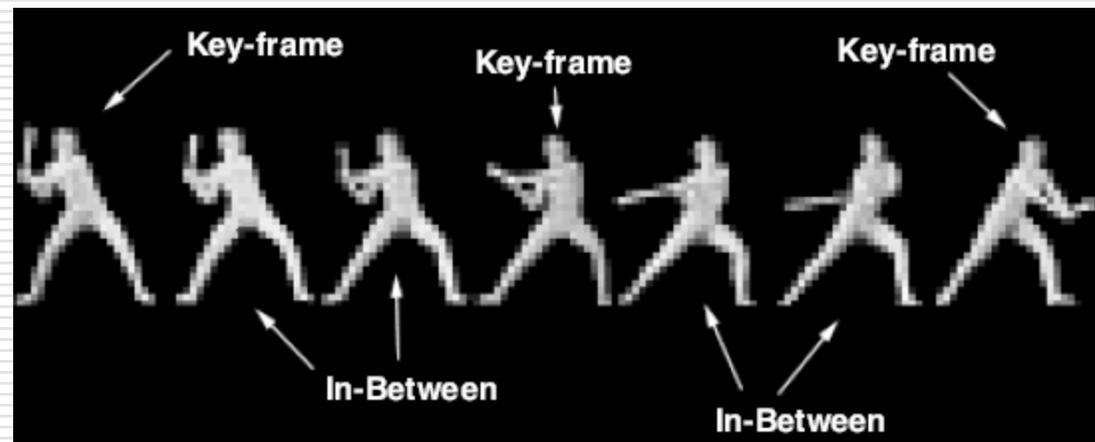 - And more prone to errors, "bugs" that interfere with the animation

FIGURE 9-3: Key-frame Example

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
Running	2	12
Swinging (an object)	2	8
Throwing (an object)	2	6
Vehicle flying	2	4
Vehicle moving	2	8
Walking	2	12

Faster motion needs fewer drawings. Slower motion needs more drawings.

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

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

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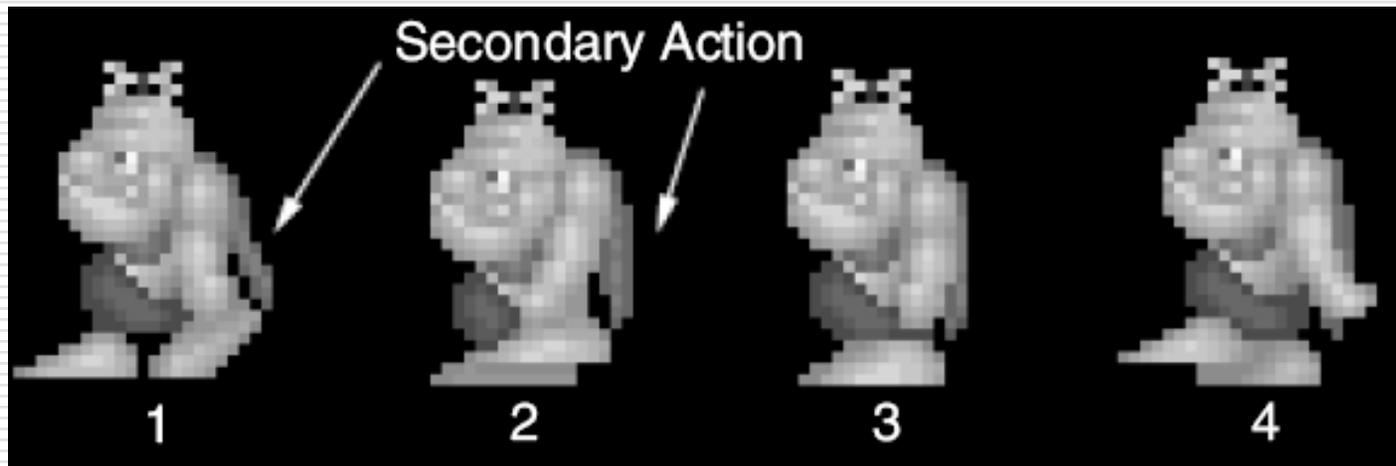
Based on Chapter 9, *Designing Arcade Computer Game Graphics*, by Ari Feldman

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)

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

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 to remove them

- ☐ Apply secondary enhancements
  - ■ Embellish to look convincing and enticing
  - ■ Exaggeration

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

Steps in Creating Animation Sequences (3 of 3)

WPI

- ☐ 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

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

Primitives

□ Used in many games

□ If you know these, you can apply primitive rules out of the box:
- Cylindrical primitive
- Rotational primitive
- Disintegration primitive
- Color flash primitive
- Scissors primitive
- Growing primitive
- Shrinking primitive
- Minor primitives (used less often)
- (See Chapter 9 of Feldman)

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

Tiles

- ☐ Needed for common backgrounds
  - ▪ Too hard to make every pixel different!
- ☐ Exploration games (especially outdoors) make heavy use of these
  - ▪ Grass, trees, water, sand
- ☐ Start with a grass tile to warm up

So You Want to Be a Pixel Artist?, by Tsugumo

Grass is Green

- Use a basic green square

- But this looks unnatural
  - Like flat, shiny metal

- No illusion of movement
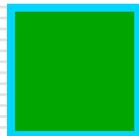
← Simply a Green Box

(Ex: `bkg_grass0`)   *So You Want to Be a Pixel Artist?*, by Tsugumo

Grass has Variation

- Can do a lot with simple enhancement of color shades

(Ex: `bkg_grass1`)   *So You Want to Be a Pixel Artist?*, by Tsugumo

Make Variation More Random

□ Can use the "spray" tool

(Ex: `bkg_grass2`)   *So You Want to Be a Pixel Artist?*, by Tsugumo

Make Look Random but with Control

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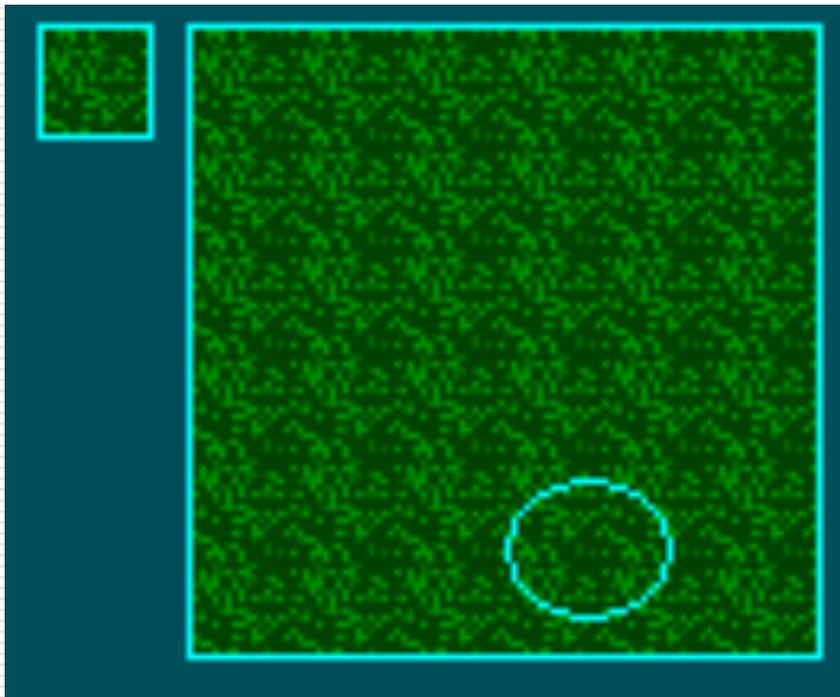 - ■ 4 pixel line strokes

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

(Ex: `bkg_grass3`)   *So You Want to Be a Pixel Artist?*, by Tsugumo
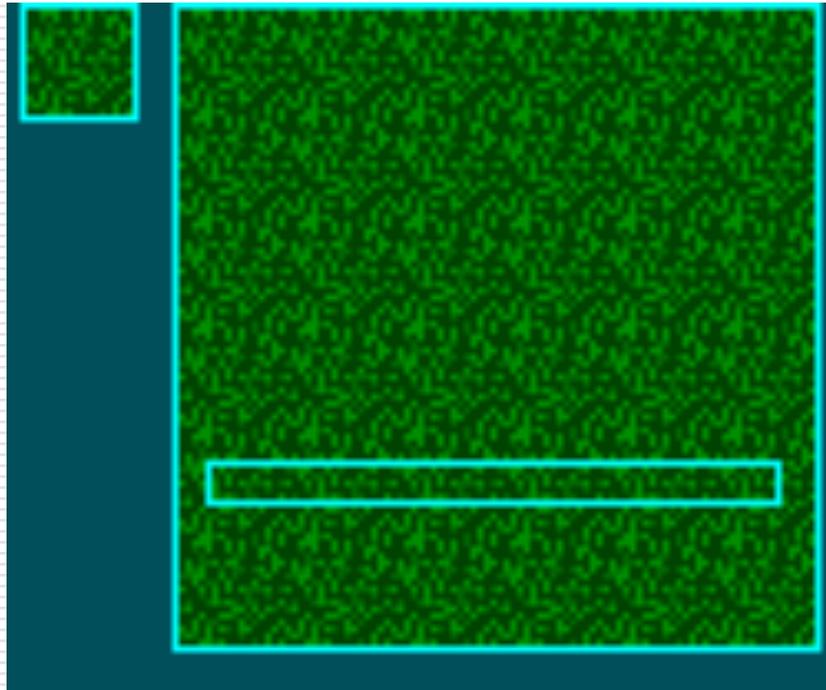
- ☐ Looks too much like tiles
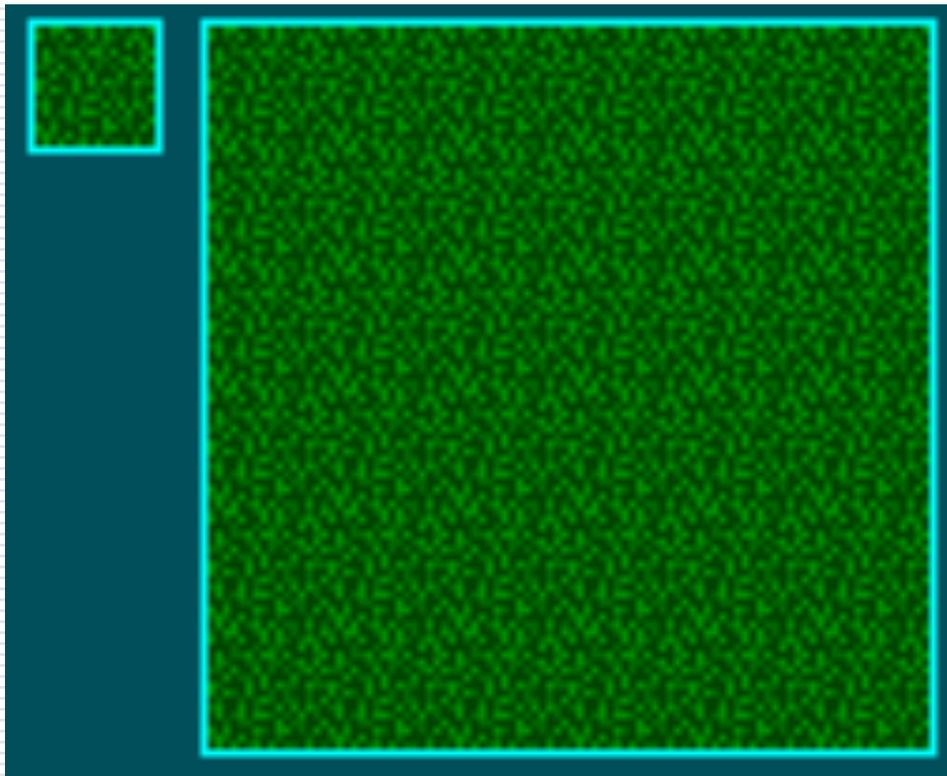- ☐ "Large" blank is problem, so remove

So You Want to Be a Pixel Artist?, by Tsugumo

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

So You Want to Be a Pixel Artist?, by Tsugumo

☐ Much better!

(Ex: `bkg_grass4`)

So You Want to Be a Pixel Artist?, by Tsugumo

Don't Try This at Home

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

OKAY, I HAVE MY GRASS TILE...

AND NOW IT'S A DIRT TILE!

AND WATER! HA HA HA!

AND DESERT! I'M A GENIUS!

So You Want to Be a Pixel Artist?, by Tsugumo

When the Rubber hits the Road?

☐ Beware of the seams where different types of tiles meet!

So You Want to Be a Pixel Artist?, by Tsugumo