

SIMPLE SKINE



EXTRA SKINE



+ EXAMPLE +



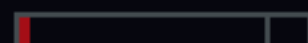
YOU CAN USE ONLY THE SIMPLE ONE  
IF YOU WANT



ALSO WORKS FINE ON OTHER SHAPES



# ATTACK ANIM TUTORIAL

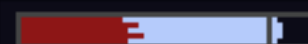


THIS SIMPLE ATTACK ANIM HAS 3 FRAMES FOR  
THE ATTACK AND 4 FRAMES TO RETURN TO IDLE

## IT'S ALL ABOUT TIMING



IDLE 1



2



3

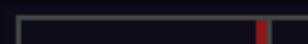


4

- IT'S IMPORTANT THAT THERE'S NO ANTICIPATION FRAME  
OR PLAYERS WILL FEEL INPUT LAG



5



6



7



8

- FRAME 8 IS A BOUNCE, SO IT GOES MORE TO THE LEFT  
THAN FRAME 1

## OTHER EXAMPLES



## SMOKE Effect

SMOKE AND OTHER PARTICLE SYSTEMS ARE COMPLICATED  
LUCIKLY INDIVIDUAL PARTICLES ARE SIMPLE

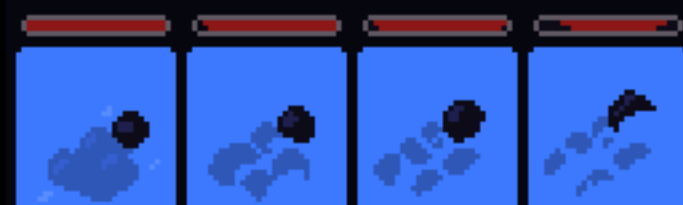
SO, THAT'S THE TRICK:

ANIMATE A SINGLE PARTICLE, GO BACK AND DO ANOTHER  
UNTIL THE SMOKE IS DONE

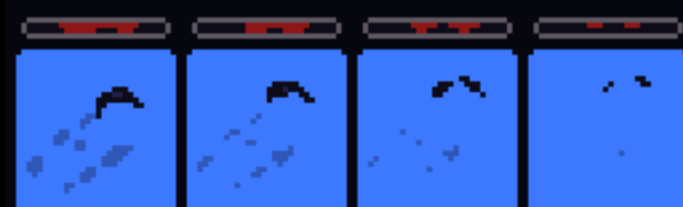


■ The first frame is a **contrast frame**  
it MAKES the next frame brighter

■ Since I WANT A tiny explosion,  
I resolve the blast in 2 frames



■ When ANIMATING COMPLEX SYSTEMS  
I ALWAYS try to FOCUS ON  
**one element** At A time



■ AVOID breaking the SHAPE too  
MUCH or it WILL look like **noise**

other examples



# **RUN CYCLE 1** **SIMPLE RUN**



8 FRAMES



16 FRAMES



A SIMPLE CYCLE CAN BE UNDERSTOOD IN 4 FRAMES THEN YOU REPEAT EVERYTHING WITH THE OTHER LEG.

YOU CAN MAKE THE ANIMATION MORE FLUID BY MAKING INBETWEENS



HIGHEST  
POSITION



WIDEST

## **JUMP**

BOTH LEGS IN THE AIR  
ARMS ALWAYS ALTERNATED W/ LEGS

## **FALL DOWN**

FALL JUST A LITTLE  
OPEN ARMS/LEGS A LITTLE



LOWEST  
POSITION



THINNEST

## **CONTACT**

HIT THE GROUND  
FORWARD LEG IS STRAIGHT

## **RECOVER**

GET READY FOR LEG/ARM TO CROSS  
FORWARD LEG MOVES BACK  
BACK LEG MOVES FORWARD

## PIXEL ART FUNDAMENTALS 1

THIS ARE SOME RULES I TEND TO FOLLOW WHEN MAKING PIXEL ART.  
I FOCUS IN INCREASING THE READABILITY AND REDUCING NOISE



- AS A GENERAL RULE I AVOID CREATING MANY PIXEL CLUSTERS
- DIAGONAL PIXELS DON'T CONNECT VERY WELL
- ORPHAN PIXELS ARE PIXELS THAT AREN'T IN A CHUNK
- TOO MANY ORPHAN PIXELS CAN RUIN AN IMAGE; THEY ADD TOO MUCH NOISE



### WHEN ANIMATING



- KEEP TRACK OF CLUSTERS
- I AVOID BREAKING CLUSTERS



- ORPHAN PIXELS ARE USEFUL TO ADD STRONG DETAILS
- I AVOID DITHER WHEN I CAN
- DITHER CAN BE USEFUL TO ADD TEXTURE
- REPEATING A PATTERN MAKES IT EASIER TO READ
- REGULAR SHAPES ARE EASY TO RECOGNIZE AND LOOK CLEAN

# TOP DOWN RUN CYCLE



- WHEN DRAWING TOP DOWN SPRITES THINK OF THE HEAD, BODY AND FEET AS 3 SHAPES ON TOP OF EACH OTHER



- A MINIMAL RUN DOWN ANIM CAN BE MADE WITH ONLY 4 FRAMES
- THE SECOND HALF IS THE FIRST HALF FLIPPED EXCEPT FOR THE HAIR AND OTHER ASYMMETRIES



- I LIKE TO EXAGGERATE ARMS MOVEMENT TO MAKE IT MORE EXPRESSIVE



- ALTERNATIVELY, YOU CAN USE THE PLATFORMER RUN CYCLE WITH SOME CHANGES
- THE BACK LEG IS MOSTLY HIDDEN

# ELECTRICITY TUTORIAL

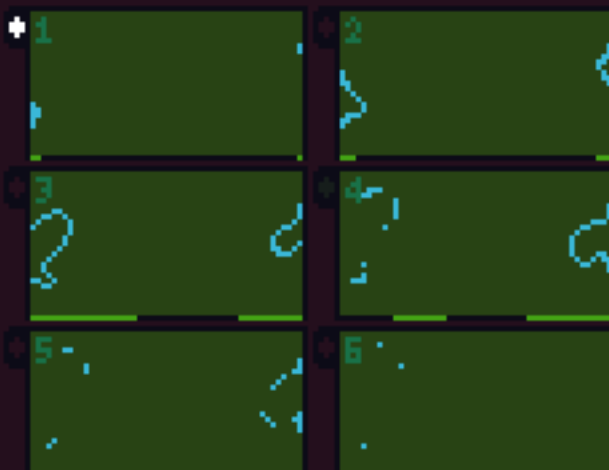


CONTRAST  
FRAME

2

- ELECTRIC ANIMATIONS MUST BE FAST
- I ALSO TRY ANIMATING IN ALTERNATED FRAMES  
ADDING BLANK FRAMES
- I LIKE TO MIX ARCS, BOLTS AND SMOKE

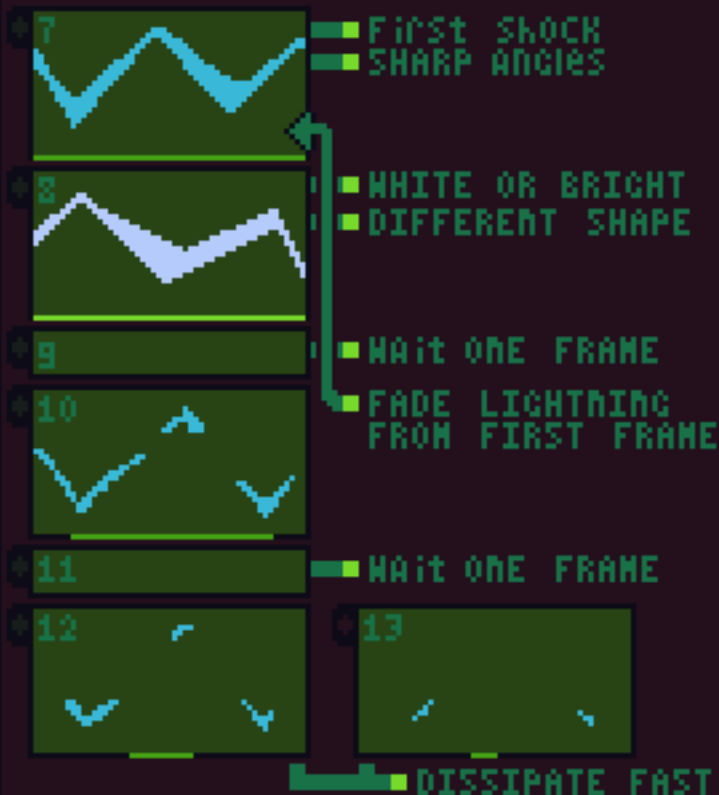
## ARC ANIMATION



- THE ARC MOVES AND DISSIPATES
- AVOID TOO MANY PARTICLES
- SOMETIMES I ADD BLANK  
FRAMES TO MAKE IT FLICKER



## BOLT ANIMATION



## TUTORIAL GLITCH EFFECT

WHEN MAKING GLITCHES I MAKE A BUNCH OF DIFFERENT EFFECTS THEN COMBINE THEM. HERE'S SOME IDEAS FOR EFFECTS:

### HORIZONTAL DISPLACEMENT



MOVE SOME HORIZONTAL STRIPS SOME PIXELS LEFT OR RIGHT, BUT CAREFUL NOT TO OVERDO IT



### CORRUPTION



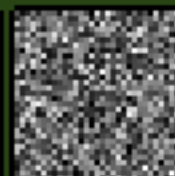
MAKE SQUARE SELECTIONS AND MOVE THEM AROUND, ADD RANDOM NUMBERS, BLACK SHAPES, GLYPHS.



### BAD V-SYNC AND FLICKER



VERTICALLY OFFSET THE IMAGE AND ADD RANDOM BLACK AND WHITE BARS ALSO ADD BLACK, WHITE AND NOISE FRAMES



### SCANLINES AND COLOR BLEED



SELECT SCANLINES AND MESS AROUND, LIKE MOVING 1PX OR CHANGING COLORS

HUDGE COLORS TO RIGHT



POPE

MAKING GLITCHES IS NOT AN EXACT THING, I ALSO TRY TO IMPROVISE, MIX STYLES, INVERT COLORS. WELL, WE WANT TO SIMULATE CORRUPTED DATA SO DON'T EVER FORGET TO ADD .%.. ....



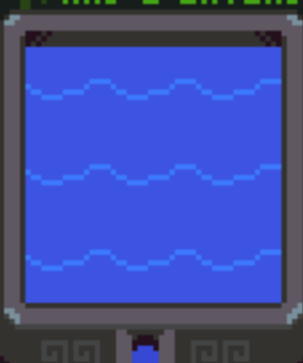
# LEVEL DESIGN PROGRESSION

FOR ME, MAKING LEVELS IS ALL ABOUT TEACHING  
LIKE SCHOOL: TEACH THE THEORY, THEN TEST THE STUDENT



# ANIMATING WATER

HAS 2 LAYERS



## TOP LAYER

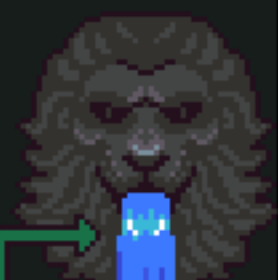
- I TRY TO IMAGINE CIRCLES CHANGING SIZE
- AVOID BIG CHANGES NEVER MOVE STUFF MORE THAN 1 PIXEL



## BOTTOM LAYER

- I JUST OFFSET IT TO THE RIGHT IN A CONSTANT SPEED

SHAKE IT



I LIKE TO ADD SMALL BRIGHT AREAS TO CORNERS AND WAVES I ALSO TRY TO MOVE THEM SLIGHTLY

WATERFALLS CAN BE MADE WITH MULTIPLE FALLING PARTICLES THAT MOVE LIKE THIS:

FOAM CAN BE ANIMATED AS A PARTICLE SYSTEM (LIKE SMOKE)

ANIMATE SMALL WAVES INDIVIDUALLY USING ONLY ONE PIXEL CHUNK FOR EACH RIPPLE (AVOID BREAKING IT IN MULTIPLE PARTS)

WAVES MOVE IN THIS PATTERN

- BUBBLES HAVE RANDOM HORIZONTAL MOVEMENT
- BUBBLES CAN FADE OR RISE TO THE TOP

- THINGS UNDERWATER ARE ALSO DISPLACED IN A SINE WAVE MOTION

# FIRE TUTORIAL

FOR ME, DRAWING FIRE IS ABOUT FLOW. I TRY TO DRAW EACH PARTICLE OR WAVE AT A TIME AND FOCUS ON THE MOVEMENT. I ALSO HAVE A SMOKE TUTORIAL (CHECK PATREON.COM/SAINT11)

## ONE WAVE

- EACH FIRE WAVE STARTS BRIGHTER AND ON THE BOTTOM
- USE WAVY SHAPES

MAKE IT LOOP?

## MULTIPLE WAVES

- START NEW WAVES EVERY 2 OR 3 FRAMES
- WHEN REACH THE LAST FRAME, CONTINUE AS IF THE FIRST FRAME WERE THE NEXT ONE

## SIMPLE FLAME

- I DIVIDE THE FLAME IN BASE AND PARTICLES
- THE BASE CHANGE THE SHAPE BUT KEEPS VOLUME
- PARTICLES DETACH FROM THE BASE

- A CHEAP TECHNIQUE I USE IS TO TRY REDRAWING THE SAME SHAPE BUT FAILING JUST A LITTLE, LOOKS LIKE THIS

DON'T BE AFRAID TO TRY DIFFERENT SHAPES AND COLORS

## SPARKS

EMBER FLICKS AND MOVES SLIGHTLY

## SMALL MOVES

- THE FLAME SPEED IS HIGHER IN THE MIDDLE
- AVOID BREAKING IT TOO EARLY/TOO MUCH. THIS DRAWING HAS ONLY ONE SHAPE
- USE WAVY SHAPES

■ THE WAVE TOP FADES IN A POINTY SHAPE

■ THE BRIGHT COLORS COME FROM BOTTOM



# VEGETATION PART 1

SHAPE

LIGHT

DETAIL

WARM  
LIGHT

ALMOST HALF  
OF THE  
GRADIENT IS  
LIGHT GREEN  
  
CREATE  
RESTING  
AREAS FOR  
THE EYES

COLD  
SHADOW

DETAILED  
BORDERS  
  
CLEAR  
INTERNAL  
AREAS

I TRY TO MAKE  
A SILHOUETTE  
THAT IS  
RECOGNIZABLE  
AS A TREE,  
EVEN WITHOUT  
THE COLORS

THE LIGHT MUST  
SHOW THAT THE  
TREE HAS VOLUME  
  
KEEP THE COLOR  
COUNT AS LOW AS  
POSSIBLE

AVOID

KEEP A LEAF PATTERN  
FOR CONSISTENCY

LEAVES FALL  
IN A SINE WAVE  
AND SPIN

HANGING VINES ARE ALWAYS AWESOME

REPEATING PATTERNS  
IS A GOOD WAY TO  
AVOID NOISE

I TRY TO DETAIL WITHOUT  
ADDING TOO MUCH NOISE  
I AVOID ORPHAN PIXELS  
THINK IN LAYERS OF FOLIAGE

# SKULLS AND BONES

← ROTATED SKULLS ARE HARD  
SHOW THE ZYGOMATIC AND MAXILLA

FRONT



WHEN DRAWING LOW RES  
SKULLS SOMETIMES I  
CAN'T FIT ALL DETAILS  
SO I PRIORITIZE  
IN THIS ORDER:

EYES  
MAXILLA  
ZYGOMATIC BONE  
TEETH  
NASAL BONE  
MANDIBLE  
TEMPORAL FOSSA



SIDE



EXAMPLES

1 PX-FLIES  
ARE COOL

TINIEST SKULLS

EVEN  
WIDTH

ODD  
WIDTH



DIAGONAL BONES  
USE LESS PIXELS

RIBBON SHAPES  
ARE GOOD FOR  
SIMPLE BONES

I USE NOISY AND  
IRREGULAR SHAPES  
WHEN MAKING  
BONE PILES

UNDEAD JOINTS  
DELAY MOVEMENT  
LIKE THIS



MAKE SKULL  
SILHOUETTES

patreon.com/saint11

## CHARACTER DESIGN 1

DRAWING A CHARACTER IS LIKE TELLING A STORY.  
CHARACTERS TELL THEIR STORY BY THEIR LOOKS, THE SILHOUETTE  
IS THE PROLOGUE, THE FIRST THING THE VIEWER WILL NOTICE

### SOME THOUGHTS AND EXAMPLES

#### FIRST SKETCH



- SHAPES MAY CHANGE WHEN ADDING DETAILS
- DON'T WORRY, JUST FOCUS ON TELLING A STORY

HAS A SWORD — HUMANOID SHAPE  
IS STRONG — HAS ARMOR

#### FIRST SKETCH



- WE MAMMALS DON'T LIKE SNAKES AND SPIDERS, SNAKE-LIKE SHAPES, LONG LIMBS, POINTED EDGES CONVEY DANGER
- WE ALSO DON'T LIKE COMPLICATED AND SHARP SHAPES, THEY ALSO CONVEY DANGER
- I THINK MAMMALS WORRY TOO MUCH
- YOU CAN SKETCH THE MAIN USING SILHOUETTES IT'S EASIER AND YOU MAKE SURE THE ACTION IS EASY TO READ

#### FIRST SKETCH



- I TRY TO ADD STRONG ELEMENTS TO THE SILHOUETTE, SOMETHING THAT WILL MAKE IT EASY TO RECOGNIZE THEM.

FLAT HEAD  
TANK TREADS

MY DRAWING PROCESS IS:

SILHOUETTE SKETCH → ADD DETAILS → ANIMATE

## ANIMATION PLANNING

WHEN I NEED TO MAKE COMPLEX ANIMATIONS I USUALLY HAVE TO PLAN AHEAD AND SKETCH EVERYTHING. HERE'S A BREAKDOWN OF MY PROCESS

### STILL FRAME



- I NEED TO KNOW WHAT I AM ANIMATING
- USUALLY THE FIRST FRAME OF THE IDLE ANIMATION

### ROUGH SKETCHES

- MAKE A BASIC PLAN OF THE ANIMATION
- TRY TO GET THE TIMING RIGHT, BUT DON'T WORRY TOO MUCH



### KEYFRAMES

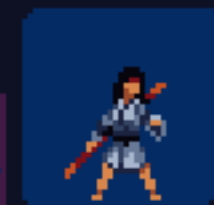
- THEN I DECIDE WHAT ARE THE IMPORTANT FRAMES AND FINISH THEM
- KEYFRAMES ARE USUALLY FRAMES THAT DEFINE AN ANIMATION, IMPORTANT POSES TO DESCRIBE AN ACTION



### IN-BETWEENS

- FILL THE GAPS?
- COPYING PASTING HELPS A LOT
- ADJUST TIMING

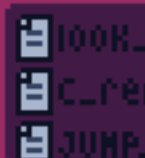
### ADDED EXTRA SPIN FRAMES



### OTHER TIPS



◆ SOMETIMES I USE DIFFERENT COLORS TO REPRESENT DIFFERENT DEPTHS IN MY ROUGHS



■ I OFTEN USE MULTIPLE FILES WITH INDIVIDUAL ANIMATIONS, AND ONE TO COMBINE THEM ALL



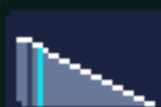
SOME IN-BETWEENS MIGHT LOOK WEIRD, DON'T WORRY ABOUT THAT



## < 1 PIXEL MOVEMENT

WAIT, YOU CAN MOVE THINGS LESS THAN 1 PIXEL? NO, YOU CAN'T  
BUT YOU CAN FAKE SOME VERY SUBTLE MOVEMENTS  
HERE'S A COLLECTION OF TRICKS I USE:

- MOVE PART OF IT FIRST
- TOO MANY STEPS CAUSE OBJECT TO LOOK BENT



- CREATE AN EXTRA PIXEL THEN SLIDE IT THROUGH THE LINE



- MOVE THE INTERIOR AFTER OR BEFORE THE SILHOUETTE
- USE DARK COLOR NEAR BORDERS

- YOU CAN USE LINE BREAKING POINTS TO CONVEY MOVEMENT

COMBINE

- FADE COLORS FOR AN ILLUSION OF <1 PIXEL MOVEMENT

- NEW LINES APPEAR LIKE THIS:  OR THIS: 

- CAREFUL: TOO MANY COLORS MAKES EVERYTHING LOOK BLURRY



- MOSTLY MOVE LIGHT, AVOID MOVING SHAPES

- NOTE THAT THE SILHOUETTE BARELY CHANGES

- YOU CAN SLIDE LINE BREAKING POINTS FOR A VERY SUBTLE MOVEMENT



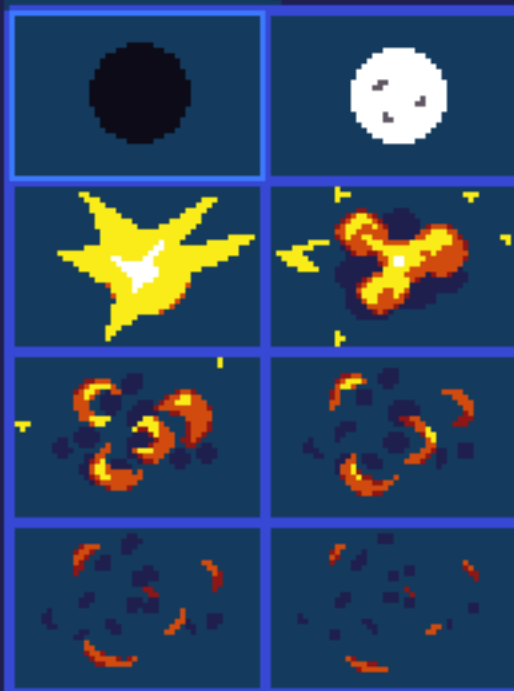
OTHER EXAMPLES

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## EXPLOSIONS PART 1

I THINK OF EXPLOSIONS IN LAYERS AND I ANIMATE  
THEM INDIVIDUALLY

FLASH BLAST FIRE SMOKE



### 1 CONTRAST FLASH

- THIS WILL MAKE OTHER FRAMES FEEL BRIGHTER

### 2 WHITE FLASH

- SOMETIMES I ADD SOME SHRAPNEL OR LIGHT LINES

### 3 SHARP BLAST

- USE SHARP ANGLES
- AVOID NOISE

### 4+ FADE

- FIRE FADES QUICKLY
- SMOKE FADES SLOWLY

THIS EXPLOSION STYLE NEEDS AT LEAST 4 FRAMES, BUT MORE FRAMES WILL MAKE A SMOOTHER ANIMATION



- BE AWARE OF SURROUNDINGS
- YOU CAN ADD FLYING BITS AFTER THE EXPLOSION IS DONE

ADD MULTIPLE EXPLOSIONS FOR AN EXTENDED EFFECT

# MACHINES AND WEIRD TECH REFERENCE SHEET



## PARALLAX AND DEPTH

PARALLAX IS THE ILLUSION THAT AN OBJECT IS CHANGING ITS POSITION DEPENDING ON THE ANGLE YOU LOOK AT IT.  
GET THE LOVE EXAMPLE IN THE PATREON POST? (IT'S FREE)

### RENDER PSEUDO-CODE

```
▶ RENDER_X = (X - CAMERA_X) * SCROLL_FACTOR + OFFSET_X  
▶ RENDER_Y = (Y - CAMERA_Y) * SCROLL_FACTOR + OFFSET_Y  
▶ DRAW_AT(RENDER_X, RENDER_Y)
```

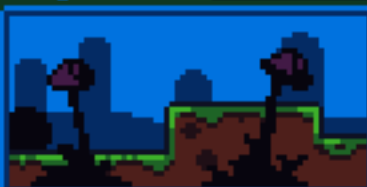


CAMERA MOVEMENT SPEED IS 2 PIXELS PER FRAME  
BUT EACH LAYER MOVES AT A DIFFERENT SPEED.  
THE SCROLL FACTOR ADJUSTS THAT DIFFERENCE

IF I CAN, I LIKE TO ADD A  
FOREGROUND LAYER TO MY GAMES  
IT USUALLY HAS A SCROLL FACTOR  
GREATER THAN ONE AND ADDS A  
LOT OF DEPTH TO THE SCENE

UI AND OTHER ELEMENTS THAT  
ARE UNAFFECTED BY CAMERA  
IDEALLY SHOULD HAVE THE  
SCROLL FACTOR OF ZERO AND ARE  
PLACED ON THE SCREEN USING  
THE OFFSET VARIABLE

WITH RARE EXCEPTIONS  
SCROLL FACTOR IS ALWAYS BIGGER THAN ZERO



	CLOSE	FAR
SATURATION	HIGH	LOW
CONTRAST	HIGH	LOW
LIGHT	BRIGHT	DARK
HUE	HOT	COLD
DETAILS	MANY	FEW
*THERE ARE EXCEPTIONS		

■ OBJECTS CLOSER TO THE CAMERA  
MOVE FASTER AND ARE USUALLY  
BRIGHTER

■ OBJECTS FAR AWAY ARE USUALLY  
DARKER, LESS SATURATED AND CAN  
FADE TO THE SKY COLOR

GET SOME „LOVE“ CODE EXAMPLES AT THE PATREON POST!

## OUTLINES

- TINT THE SPRITE BLACK OR OTHER COLOR (IF A FILL SHADER IS AVAILABLE)
- RENDER IT 4 TIMES: UP, DOWN, LEFT, AND RIGHT
- THEN JUST RENDER IT AS USUAL

## RENDER PSEUDO-CODE

```
▶ DRAW_TINTED( SPRITE, X+1, Y, C_BLACK)
▶ DRAW_TINTED( SPRITE, X-1, Y, C_BLACK)
▶ DRAW_TINTED( SPRITE, X, Y+1, C_BLACK)
▶ DRAW_TINTED( SPRITE, X, Y-1, C_BLACK)
▶ DRAW( SPRITE, X, Y)
```

## BLINKING SPRITE

- USE GAME TIMER MODULO (REMAINDER AFTER A DIVISION) TO KNOW WHEN TO DRAW THE SPRITE

## RENDER PSEUDO-CODE

```
▶ IF (GAME_TIMER%4 < 2)
  ↳ DRAW( SPRITE, X, Y)
▶ ELSE
  ↳ // DON'T DRAW
```

GET THE REMAINDER OF THE GAME\_TIMER/4 DIVISION, IF IT'S LESS THAN 2, THEN DRAW THE SPRITE

- APPEARS FOR 2 FRAMES
- DISAPPEAR FOR 2 FRAMES

## UNDERWATER / GHOSTLY

- COOL TRICK USING DRAW QUADS TO SLICE AN IMAGE AND DRAW IT WHILE ALSO OFFSETTING IT
- REMEMBER, SLICING A PIXEL ART IMAGE IS VERY USEFUL FOR MANY EFFECTS

## RENDER PSEUDO-CODE

```
▶ SLICE = SPRITE_HEIGHT/10
▶ FOR (I=0; I<10; I++)
  ↳ MY_QUAD = NEW_QUAD(0, I*SLICE, SPRITE_WIDTH, SLICE)
  ↳ DISPLACE_X = INT(SIN(GAME_TIMER + I))
  ↳ DRAW_QUAD( SPRITE, X+DISPLACE_X, Y+I*SLICE, MY_QUAD)
```

## ANIMATION EASING

EASING IS ALL ABOUT ACCELERATION

MAKING A TRAIL IS GOOD  
FOR FAST MOVEMENT

### NO EASING



START  
POS

END  
POS

- IN REAL LIFE NOTHING MOVES LINEARLY
- LINEAR MOVEMENT LOOKS DULL AND UNINTERESTING

### SLOW IN/OUT



- I LOVE MAKING THE MOVEMENT ACCELERATE AND/OR DECELERATE DURING MOTION  
THIS MAKES EVERYTHING MORE DYNAMIC AND FLUID
- I LIKE TO DISTORT THE MIDDLE FRAME

### BACK IN/OUT



- ALSO CALLED ANTICIPATION AND OVERSHOOT
- SPECIALLY USEFUL FOR ATTACKS AND OTHER FAST OR STRONG MOVEMENTS
- SOMETIMES I EVEN SKIP THE MIDDLE FRAME TO MAKE THE MOVEMENT STRONGER

THE DISTANCE BETWEEN  
DRAWINGS GIVES US THE  
FEELING OF ACCELERATION



YOU CAN ALSO DO A LOT  
OF THIS VIA CODE? SO  
GET THE LOVE EXAMPLE  
FOR AN  
EASING FUNCTIONS  
CHEAT SHEET



# PIXEL ART PIPELINE



## IMAGE SIZE

- THIS IMAGE IS 48X48 PIXELS
- WHEN NOT SURE GO WITH SMALLER SIZES

## BACKGROUND

- DRAW FROM BACK TO FRONT



## SKETCH

- DON'T WORRY ABOUT DETAILS
- FOCUS ON SHAPE AND GENERAL IDEA





## PIXEL ART PIPELINE

AVOID TOO  
MUCH CONTRAST



### IMAGE SIZE

- THIS IMAGE IS 48X48 PIXELS
- WHEN NOT SURE GO WITH SMALLER SIZES

### BACKGROUND

- DRAW FROM BACK TO FRONT



### SKETCH

- DON'T WORRY ABOUT DETAILS
- FOCUS ON SHAPE AND GENERAL IDEA



## PIXEL ART PIPELINE



### IMAGE SIZE

- THIS IMAGE IS 48X48 PIXELS
- WHEN NOT SURE GO WITH SMALLER SIZES

### BACKGROUND

- DRAW FROM BACK TO FRONT



### SKETCH

- DON'T WORRY ABOUT DETAILS
- FOCUS ON SHAPE AND GENERAL IDEA



FIXED THE POSE



### SILHOUETTE

- CHARACTER MUST BE RECOGNIZABLE FROM THE SILHOUETTE

- DON'T WORRY TOO MUCH ABOUT DETAILS

### COLOR BLOCKS

- FOCUS ON THE BIG COLOR MASSES

- SOME DETAILS ARE GOOD BUT DON'T WASTE TOO MUCH TIME

### OUTLINE

- I LIKE TO OUTLINE THE OUTSIDE OF IMPORTANT OBJECTS

- I ALSO ADD OUTLINE TO THINGS IN FRONT OF THE OBJECT



EVER IF IT'S JUST A PART OF THE SAME OBJECT



## SILHOUETTE

- CHARACTER MUST BE RECOGNIZABLE FROM THE SILHOUETTE

- DON'T WORRY TOO MUCH ABOUT DETAILS

## COLOR BLOCKS

- FOCUS ON THE BIG COLOR MASSES

- SOME DETAILS ARE GOOD BUT DON'T WASTE TOO MUCH TIME

## OUTLINE

- I LIKE TO OUTLINE THE OUTSIDE OF IMPORTANT OBJECTS

- I ALSO ADD OUTLINE TO THINGS IN FRONT OF THE OBJECT



EVER IF IT'S JUST A PART OF THE SAME OBJECT



SOME SILHOUETTE  
FIXES



### SILHOUETTE

- CHARACTER MUST BE RECOGNIZABLE FROM THE SILHOUETTE

- DON'T WORRY TOO MUCH ABOUT DETAILS

### COLOR BLOCKS

- FOCUS ON THE BIG COLOR MASSES

- SOME DETAILS ARE GOOD BUT DON'T WASTE TOO MUCH TIME

### OUTLINE

- I LIKE TO OUTLINE THE OUTSIDE OF IMPORTANT OBJECTS

- I ALSO ADD OUTLINE TO THINGS IN FRONT OF THE OBJECT



EVER IF IT'S  
JUST A PART  
OF THE SAME  
OBJECT

KEEP IMPROVING  
THE POSE



## LIGHT

- ADD COLOR BY COLOR
- AVOID NOISE OR TOO MUCH DETAIL



- I PREFER USING BIG PIXEL CLUSTERS

## DETAILS

- KEEP ADDING COLORS
- FINALLY ADD DETAILS TO THINGS IN FOCUS
- ADD FEWER DETAILS TO FAR THINGS

## EXTRA FIXES

- CLEAN UP NOISE AND ORPHAN PIXELS

- ADD SMALL HIGHLIGHTS



- CHECK THINGS LIKE:
  - PROPORTION
  - LIGHT DIRECTION
  - HARD TO READ AREAS



## LIGHT

- ADD COLOR BY COLOR
- AVOID NOISE OR TOO MUCH DETAIL



- I PREFER USING BIG PIXEL CLUSTERS

## DETAILS

- KEEP ADDING COLORS
- FINALLY ADD DETAILS TO THINGS IN FOCUS
- ADD FEWER DETAILS TO FAR THINGS

## EXTRA FIXES

- CLEAN UP NOISE AND ORPHAN PIXELS

- ADD SMALL HIGHLIGHTS



- CHECK THINGS LIKE:
  - PROPORTION
  - LIGHT DIRECTION
  - HARD TO READ AREAS



SMALL HIGHLIGHTS

FINAL DETAILS IN  
THE BACKGROUND

KEEP FIXING THE SILHOUETTE



## LIGHT

- ADD COLOR BY COLOR
- AVOID NOISE OR TOO MUCH DETAIL



- I PREFER USING BIG PIXEL CLUSTERS

## DETAILS

- KEEP ADDING COLORS
- FINALLY ADD DETAILS TO THINGS IN FOCUS
- ADD FEWER DETAILS TO FAR THINGS

## EXTRA FIXES

- CLEAN UP NOISE AND ORPHAN PIXELS
- ADD SMALL HIGHLIGHTS 
- CHECK THINGS LIKE:
  - PROPORTION
  - LIGHT DIRECTION
  - HARD TO READ AREAS



## RUINS

### DETAILS



#### CLAW/BITE MARKS

- REPEAT PATTERN
- THICKER IN THE MIDDLE



#### CRACKS

- DO NOT EXAGGERATE
- TREE-LIKE PATTERN



#### GLITCHES

- I HAVE ANOTHER TUTORIAL ON THAT CHECK IT OUT!



#### BUMPS

- SMALL IRREGULAR SHAPES
- A LITTLE NOISY



#### MISSING PARTS

- ADD BG AND INSIDE OBJECT

WHY IS THIS OBJECT  
RUIED?  
RUINS SHOULD  
ALWAYS TELL A STORY

IF THE DAMAGE  
IS RECENT  
OBJECTS WILL OFTEN  
HAVE SIGNALS  
LIKE FIRE OR SMOKE

COBWEBS  
DON'T MAKE  
THEM TOO BRIGHT

BREAK  
SIMMETRY

UNEVEN SURFACES

REPEAT OBJECTS  
TO SHOW DIFFERENT  
LEVELS OF DESTRUCTION

OLD RUINS  
MIGHT HAVE PLANTS  
GROWING ON IT  
LOW CONTRAST  
AND ROUNDED EDGES

HANGING CABLES  
WIRES  
VINES  
ETC...

## SPACESHIP PROPULSION



- BRIGHT FRAME, LIKE A SMALL EXPLOSION.
- LIGHTEN THE SHIP ON THIS FRAME



- STRETCHED FLAME
- TALL AND THIN SHAPE



- START SHIFTING MASS BACK TO THE PROPULSOR
- A LITTLE PIECE OF THE FLAME GETS THROWN BACK



- FLAME STARTS TO GET WIDER AND SHORTER
- FLAME GETS DARKER



- FLAME GETS EVEN DARKER AND SMALLER

### OTHER EXAMPLES

YOU MAY ALSO MAKE THE PROPULSION WITH PARTICLES, LIKE THIS:



#### CAREFUL:

IF THE SHIP MOVES TOO MUCH CONSIDER MAKING THE PARTICLES PROCEDURALLY

NAVY'S FIRE-LINE PATTERNS ALSO WORK

CHECK MY FIRE TUTORIAL



SPARKS CAN ALSO WORK IF THERE'S ATMOSPHERE  
CHECK MY EXPLOSION AND SMOKE TUTORIAL



## DARK MAGIC EFFECTS

### COLORS

HERE ARE SOME COLORS THAT I LIKE TO USE ON DARK EFFECTS



COLD ←-----→ WARM

LOTS OF COMPLEMENTARY COLORS, HIGH CONTRAST AND PURPLE

### SMOKE

MAKE IT MORE FLUID-LIKE THAN USUAL, WITH MORE CONNECTIONS  
FADES IN SPIRALS AND SLOWLY



### LIGHT FROM BELOW

THIS ANGLE FEELS UNNATURAL AND WEIRD AND THAT'S EXACTLY WHAT WE WANT



### LIGHTNING AND SYMBOLS

ALWAYS GREAT FOR MYSTIC STUFF



IT'S ALL ABOUT CONVEYING FEELINGS

- UNNATURAL
- CHAOTIC
- MYSTICAL
- GHOSTLY
- MORBID

■ I USE THE BLACK CIRCLE TO CREATE CONTRAST

■ UNNATURAL COLORS FOR LIGHTNING GIVES AN EERIE FEEL

■ USE SHARP SHAPES WHEN POSSIBLE

■ USE OVERLAPPING ANIMATIONS FOR A CHAOTIC FEEL

■ ADD FACES OR SKULLS

## PORTRAITS



1 START WITH A ROUGH LINE SKETCH.  
IN SMALL RESOLUTIONS I LIKE TO USE COLORED LINES.

2 FILL AREAS WITH BASE COLORS.  
FILL ONLY BIG AREAS, AVOID DETAILS.

3 BLOCK OUT LIGHTS.  
ALSO START FIXING DETAILS,  
CHECK FOR PROPORTION ERRORS  
AND FIX LINES:

4 ADD HIGHLIGHTS, DETAILS  
AND ANTI ALIAS.  
I LIKE TO ADD A BLACK BORDER  
FOR CONTRAST TOO.

HERE'S SOME OF MY FAVORITE  
PROPORTIONS?

REMEMBER THAT EVERY FACE  
IS DIFFERENT

LEARN BASIC  
PROPORTIONS,  
SO YOU CAN  
DISTORT THEM



MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

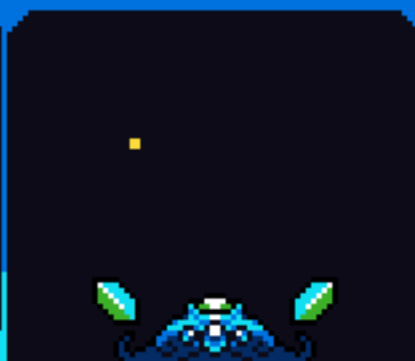
## LIGHT MAGIC EFFECTS

### COLORS

HERE ARE SOME COLORS  
THAT I LIKE TO USE  
ON LIGHT/HOLY EFFECTS



COLD ←-----→ WARM  
ANALOGOUS COLORS  
BRIGHT AND SATURATED



### SPARKS

■ SMALL SPARKS THAT FALL  
SLOWLY OR EVEN GO UP  
■ TOO MANY SPARKS WILL CAUSE  
NOISE



### LIGHT FROM ABOVE

CONVEYS GODLY AND  
HEAVENLY THINGS



### PARTICLE TRAILS

ARE GREAT FOR CONVEYING  
ORDER AND INTELLIGENT DESIGN  
START FAST THEN SLOW DOWN



IT'S ALL ABOUT  
CONVEYING FEELINGS

- ORDER
- INTELLIGENCE
- CLEANLINESS
- CALM
- GOOD

■ RAIN AND OTHER  
WATER THEMED FX  
WORK WELL

■ AVOID TOO MANY  
EXPLOSIONS

■ USE ROUNDED OR  
SQUARE SHAPES WHEN  
POSSIBLE; AVOID  
SPIKES/POINTY  
SHAPES

■ AVOID SMOKE

■ THINGS NEED TO  
HAPPEN SEQUENTIALLY  
EXAMPLE:

RAIN>EXPLOSION>SYMBOL

## WINGS/FLYING

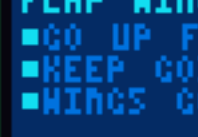


- THE MOVEMENT OF THE WING USUALLY ALTERNATES WITH THE BODY MOVEMENT
- GOING UP IS MUCH FASTER THAN GOING DOWN



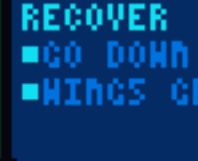
### FALLING DOWN

- FALLING: ONE PIXEL PER FRAME
- WINGS RISE WHILE FIGHTING GRAVITY



### FLAP WINGS

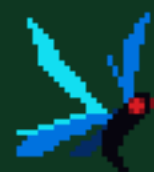
- GO UP FAST: 3 PIXELS
- KEEP GOING UP: SLOWER: 1 PIXEL
- WINGS GO DOWN AND ALMOST TOUCH THE OTHER



### RECOVER

- GO DOWN 1 PIXEL THEN STABILIZE/STOP
- WINGS GETTING BACK TO OPEN POSITION

### OTHER EXAMPLES



- SUBPIXEL IS USEFUL FOR HOVER ANIMATION
- VERTICAL MOVEMENT IS WHAT MAKES IT REALISTIC

- FAST WINGS HAVE FEWER FRAMES
- DRAW MULTIPLE WINGS FOR MOTION BLUR

WINGS ARE LIKE ARMS



- ASSYMETRICAL START
- START VERY WIDE
- WITH EACH FRAME THE DROP GETS TALLER AND THINNER
- THE THICKER THE FLUID THE LONGER IT HANGS ON THE BASE
- MAY EVEN BOUNCE IN SOME CASES



SLIMY BUBBLES ARE HEAVY SO THEY MOVE SLOWER



- START WIDE
- MOVE SLOW
- SMOOTH SHAPES
- TALL AND THIN
- OPEN HOLES
- CREATE PARTICLES
- ANIMATE THEM INDIVIDUALLY



- HIGHLIGHT
- BASE COLOR
- REFLECTION
- SHADOW

■ THICK SLIMES CAN CREATE BRIDGES AND HOLES

■ SLIME DRIPS IN LAYERS

■ HARD (SMALL)

■ SPECULAR HIGHLIGHT

■ SLIME WILL RESIST BREAKING INTO PARTICLES

■ AVOID SHARP CORNERS

## ROCK FORMATIONS

### SEDIMENTARY



- MADE OF LAYERED MATERIAL
- SOFTEST TYPE, CRUMBLES A LOT
- BIG SOFT HIGHLIGHTS

#### CAREFUL!

- AVOID ORPHAN PIXELS AND ADDING TOO MUCH NOISE
- DON'T USE TOO MANY COLORS OR DETAILS



### METAMORPHIC



- MADE FROM IGNEOUS OR SEDIMENTARY
- STRONGER HIGHLIGHTS
- STRONG, BREAKS IN LARGER CHUNKS
- LARGE CLEAN AREAS

- ▼START WITH THE SILHOUETTE
- ▼ADD BASE SHADOWS
- ▼ADD MORE LAYERS WITH A SOFTER SHADOW
- ▼ADD HIGHLIGHT AREAS
- ▼ADD BACK LIGHT AND REDUCE NOISE
- ▼CRUMBLING PARTS

### IGNEOUS




- MADE FROM LAVA, MELTED ROCK
- HAS ROUNDED SHAPES
- GAS BUBBLES CAN CAUSE HOLES AND VERY POINTY SHAPES
- CAN BE VERY POROUS, SO VERY SOFT HIGHLIGHTS






## VEGETATION PART 2

### THINK IN LAYERS

 HIGHLIGHTS

 BASE

 SHADOW

 DIRT

■ AVOID TOO MANY  
COLORS

■ AVOID ORPHAN  
PIXELS

■ AVOID NOISE

■ DIFFERENT DEPTHS  
AND PATTERNS  
BREAK MONOTONY

■ BIG EMPTY AREAS  
GIVE FOCUS TO  
OTHER AREAS

■ DON'T OVERDO THE  
DETAILS

THINK IN  
3 DIMENSIONS

HANGING VINES  
WORK HERE TOO

DETAIL IN  
FRONT OF  
PLAYER

COLLISION  
LIMIT

GROUND  
LEAF

HIGHLIGHT  
BASE  
SHADOW

■ EACH DETAIL MUST BE  
CONSCIOUS, DON'T THROW  
RANDOM DOTS AROUND

■ BORDERS HAVE MORE  
DETAIL AND CONTRAST

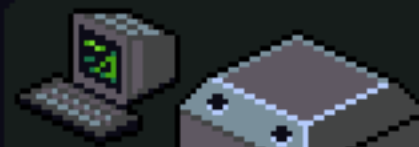
■ WOOD HAS A TEXTURE  
WITH MANY ALMOST  
PARALLEL GROOVES,  
LIKE THIS:

SULKS USE THE SHADOW COLOR  
AND DON'T APPEAR IN LOW  
CONTRAST AREAS

## LINE FUNDAMENTALS

### REGULAR STRAIGHT LINES

ALL STEPS HAVE THE SAME  
NUMBER OF PIXELS  
USE REGULAR LINES WHEN POSSIBLE



### 2PX IRREGULAR STRAIGHT LINES

- NON-IDEAL, BUT USEFUL
- REPEAT A PATTERN WITH ADJACENT NUMBERS

LINE: 2PX, 2PX, 3PX, 2PX, 2PX, 3PX

### CURVES

- EACH STEP SHOULD BE SMALLER THAN THE PREVIOUS UNTIL YOU REACH THE "CORNER"
- THEN YOU GO BACKWARDS, INCREASING THE STEP SIZE

### BAD CORNERS

- LINE STEPS SHOULD ALWAYS CONNECT DIAGONALLY
- CORNERS LIKE THIS CREATE A THICKER POINT IN THE LINE

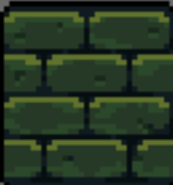
### UNINTENTIONAL SQUARES

- PIXELS HAVE THIS TENDENCY TO FORM BIG SQUARES WHEN ADJACENT TO OTHERS
- TO AVOID THAT, TRY TO PLACE COLORS IN A BRICK-LIKE PATTERN

← ALWAYS LOOK FOR IMAGINARY SQUARES



## CITY BACKGROUNDS

- START WITH THE BASIC BRICK SHAPES SOMETHING LIKE THIS: 
- CHOOSE A LIGHT SOURCE AND MAKE THE HIGHLIGHTS
- ADD EROSION POINTS AND SMALL CRACKS
- DON'T FORGET ABOUT THE LIGHT DIRECTION
- MAKE THE BRICK DIVISION DEEPER IN SOME POINTS
- REDUCE CONTRAST ADDING A LIGHTER SHADE/LIGHT ON THE DETAILS

SKY

LOW

SATURATION

LOW

CONTRAST

- BLOCK OUT YOUR IDEA
- CHOOSE LIGHT

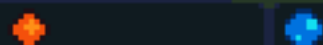
- 2 COLORS FOR THE SKY
- 3 COLORS FOR THE FAR BG
- LOW COLOR COUNT FOR FG

- SOURCE AND GET THE SHAPES RIGHT
- BLOCK OUT STRUCTURAL DETAILS AND OBJECTS
- ADD OBJECT DETAILS AND TEXTURES
- ADD VEGETATION AND ANY ENVIRONMENTAL STUFF LIKE MUD, RAIN, SNOW...

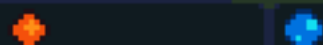


## MOTION BLUR

### NO BLUR



### W/ BLUR



### IMPORTANCE OF MOTION BLUR

AS YOU CAN SEE ON THE LEFT, MOTION BLUR IS GREAT FOR MAKING MOVEMENT MORE FLUID AND NATURAL, EVEN SLOW MOVEMENT CAN BENEFIT FROM IT

THERE ARE MANY WAYS YOU CAN MAKE A MOTION BLUR



### COLORS

- LIGHTER COLORS "BLEED" OVER DARKER COLORS

- DARKER COLORS ARE USED FOR FADING



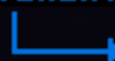
### COMPLEMENTARY FLASHING

- IF YOUR ANIMATION IS VERY FAST YOU CAN FLASH COLORS TO MIX THEM
- THIS GIVES A VERY DYNAMIC FEELING

- THE MOTION BLUR SMEARS THE IMAGE, LIKE IT'S TRYING TO CONNECT IT TO THE PREVIOUS FRAME

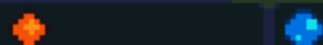


MOTION BLUR IS ALSO A CHEAP WAY TO CONVEY COMPLICATED MOVEMENT

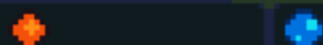


## MOTION BLUR

### NO BLUR



### W/ BLUR



### IMPORTANCE OF MOTION BLUR

AS YOU CAN SEE ON THE LEFT, MOTION BLUR IS GREAT FOR MAKING MOVEMENT MORE FLUID AND NATURAL, EVEN SLOW MOVEMENT CAN BENEFIT FROM IT

### THERE ARE MANY WAYS YOU CAN MAKE A MOTION BLUR



### COLORS

- LIGHTER COLORS "BLEED" OVER DARKER COLORS

- DARKER COLORS ARE USED FOR FADING



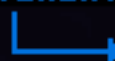
### COMPLEMENTARY FLASHING

- IF YOUR ANIMATION IS VERY FAST YOU CAN FLASH COLORS TO MIX THEM
- THIS GIVES A VERY DYNAMIC FEELING

- THE MOTION BLUR SMEARS THE IMAGE, LIKE IT'S TRYING TO CONNECT IT TO THE PREVIOUS FRAME



MOTION BLUR IS ALSO A CHEAP WAY TO CONVEY COMPLICATED MOVEMENT



# SQUASH AND STRETCH



## MASS... MASS NEVER CHANGES

WHEN CHANGING THE WIDTH OF AN OBJECT, ALWAYS CHANGE THE HEIGHT TOO, THIS WAY THE MASS IS CONSTANT.

THIS IS THE MOST IMPORTANT RULE OF SQUASH AND STRETCH



LIKE MOTION BLUR, SQUASH IS VERY USEFUL TO CONVEY MOVEMENT

STRETCHING IS A GOOD AND CHEAP WAY OF SMOOTHING FAST ANIMATIONS

## ANTICIPATION



ACTION

PREPARATION

THE PREPARATION SQUASHES THE OBJECT IN THE OPPOSITE DIRECTION OF THE ACTION

THE OBJECT MATERIAL IS IMPORTANT, STIFF OBJECTS DO NOT DEFORM AS MUCH

MIX WITH MOTION BLUR FOR AN EXTREME EFFECT

ADD SQUASH AND STRETCH TWEENS TO YOUR GAME CODE FOR MORE DYNAMISM



PREPARE



JUMP



BRAKE



PREPARE



RECOVER



## METALS

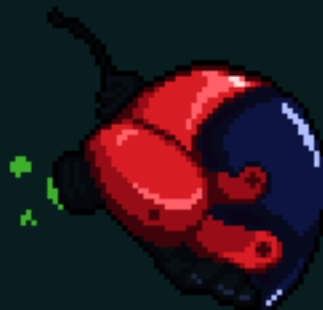
- GENERAL SHAPE
- ADD BASE LIGHT
- ADD BASE SHADOW
- BACKLIGHT AND SPECULAR
- REFLECTION/INTERFERENCE

LIGHT  
USUALLY COLDER  
LESS SATURATED

DARK  
USUALLY WARMER  
MORE SATURATED

### METAL COLOR RAMP

PLASTIC  
(FOR REFERENCE)



■ METAL IS VERY REFLECTIVE SO EXPECT A STRONG BACK LIGHT

■ SCRATCHES AND BRUISES TELL A STORY ABOUT THAT OBJECT

■ METALS CAN BE MORE OR LESS GLOSSY, DEPENDING ON THEIR USE AND CONSERVATION, USE ACCORDINGLY

■ REFLECTIONS DO NOT WORK LIKE THIS, BUT IF IT LOOKS COOL WHO CARES

■ METAL IS STIFF, IT DOESN'T STRETCH, BUT YOU CAN MOVE ITS PARTS INDIVIDUALLY

■ LIGHT/REFLECTION FROM METAL SHOULD ALSO BE ANIMATED DEPENDING ON THE ANGLE

■ FOR EASY REFLECTIONS DO MULTIPLE LINES OF LIGHT/SHADOW



## BULLETS

### COLOR RAMP



THE CORE IS WARMER AND BRIGHTER  
THE BORDERS ARE COOLER AND DARKER

### BULLET DAMAGE

■ DANGEROUS BULLETS SHOULD DRAW  
MORE ATTENTION TO THEMSELVES

■ BLINKING IS A GOOD AND CHEAP  
WAY TO DO IT



### SPEED

■ FAST BULLETS DO NOT NEED AS MANY  
DETAILS OR ANIMATIONS

■ FAST BULLETS ARE USUALLY ELONGATED  
IN THE DIRECTION OF MOVEMENT



CONSIDER MAKING  
BULLETS BIGGER SO  
PLAYERS CAN SEE THEM

### FEEDBACK



MUZZLE FLASH AND  
IMPACT SHRAPNEL ARE  
BOTH VERY IMPORTANT  
THEY COMMUNICATE THE  
PLAYER WHERE THE  
BULLET STARTS AND ENDS



ESPECIALLY IF THE BULLET  
IS NOT VISIBLE?

### BE CREATIVE WITH THE BULLET SHAPE





## CHARACTER IDLE

I REALLY LIKE TO MAKE VERY BOUNCY CHARACTER IDLES  
HERE'S A FEW THINGS I KEEP IN MIND  
AND SOME SOMEWHAT EXAGGERATED EXAMPLES

### 2 FRAMES



THE BASIC IDEA FOR MY BOUNCY IDLE IS:  
1 ■ MOVE DOWN ONE PIXEL, OPEN ARMS, BEND KNEES  
2 ■ MOVE UP ONE PIXEL, ARMS MOVE DOWN  
CHARACTER DOESN'T CHANGE MASS

### 3 FRAMES



THAT MIDDLE FRAME ADDS A LOT TO THE IDLE:  
■ MAKES THE "FALL DOWN" SLOWER  
■ MAKES THE KNEE BEND TRANSITION BETTER  
■ MAKES THE HEAD TRANSITION SMOOTHER BY  
DELAYING THE FACE MOVEMENT

### 6 FRAMES



■ WITH MORE FRAMES I LIKE TO ADD SECONDARY  
ANIMATIONS, LIKE THE HAIR LAGGING BEHIND  
THE HEAD  
■ HERE I LIKE TO ADD LOTS OF <1 PIXEL MOVEMENT  
(CHECK MY OTHER TUTORIAL ON THAT)



A GOOD TRICK IS TO MOVE  
THE CONTENTS OF THE  
FACE/BODY/ETC AFTER THE  
SILHOUETTE HAS MOVED

REMEMBER THAT THE IDLE POSE  
IS GREAT FOR SHOWING THE  
CHARACTER'S PERSONALITY  
USE IT TO SHOW SPECIAL  
ANIMATIONS SUCH AS:



■ VERTICAL MOVEMENT ALONE  
IS BORING  
■ I ALWAYS TRY TO HAVE  
THE HORIZONTAL MOVEMENT  
COMPENSATE THE VERTICAL



■ SOMETIMES THE ANIMATION  
HAS <1 PIXEL MOVEMENTS



■ BLINK  
■ YAWN  
■ LOOK AROUND  
■ SCRATCH

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## MAKING TILES

### 1. MAKE A MASTER TILE

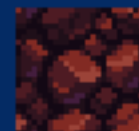
I START BY MAKING A "FULL" TILE THAT WRAPS ON ALL 4 EDGES



- DRAW A ROUGH TILE
- OFFSET IT BY 50%
- REMOVK THE CENTER OF THE TILE
- OFFSET IT AGAIN



### 2. MAKE THE MAIN EDGE TILES ■■■■



TOP



MID



BOT

### 3. MAKE THE OTHER TILES

THIS PART DEPENDS ON THE ENGINE AND SYSTEM YOUR GAME IS USING

HERE'S A GUIDE ON THE SHAPES I USUALLY MAKE:

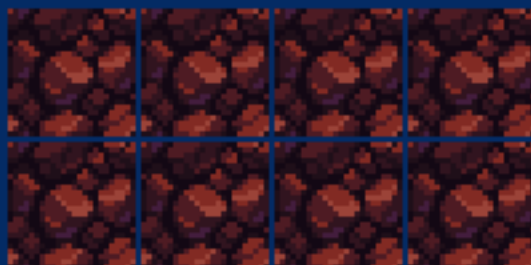


HORIZONTAL AND VERTICAL TUBES



### 4. ADD SOME VARIATION

ESPECIALLY FOR THE MIDDLE AND TOP TILE



CHANGE ONLY THE CENTER OF THE TILE

## BLOOD AND GUTS



- DON'T OVERDO THE BLOOD DROPS OR IT WILL LOOK TOO MESSY
- I ONLY USE ORPHAN PIXELS WHEN DRAWING IN VERY LOW RESOLUTION
- TRY TO USE ROUND SHAPES WHEN POSSIBLE



- FOR BIG BLOOD SPLASHES I LIKE TO START WITH A VERY POINTY SHAPE
- THEN I SPREAD IT WHILE STILL CONNECTING PARTICLES TO EACH OTHER FOR AS LONG AS I CAN



- START THE JET WITH SHARP EDGES; THEN THE AIR RESISTANCE SHOULD BEND IT
- I LIKE TO ADD GRAVITY; MAKING THE PARTICLES FALL BEFORE FADING
- I ALWAYS AVOID ORPHAN PIXELS UNLESS IT'S THE LAST FRAME OF A PARTICLE

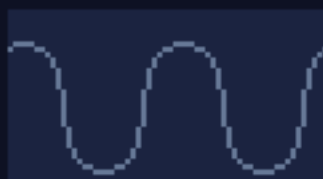


- USE HUE VARIATIONS SO THE WHOLE THING WON'T LOOK BORING
- GUTS ARE MOSTLY LIKE A BUNCH OF TUBES AND WATER BALLONS
- ADD SMALL SHINY SPOTS TO SHOW THAT IT'S WET AND SLIMY



MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## FABRIC/FLAGS



- FABRIC IN THE WIND MOVES IN A SINE WAVE-LIKE PATTERN
- I IMAGINE THAT THE MOVEMENT IS OFFSETTING IN THE DIRECTION OF THE WIND



- I LIKE TO DRAW A LINE AS A GUIDE
- LIGHT AND SHADOW SHOULD MOVE AWAY FROM THE WIND SOURCE



- AVOID ADDING TOO MANY FOLDS OR IT CAN GET TOO NOISY
- DARK AREAS HAVE LESS DETAIL
- MOVE THE CLOTH, BUT RESPECT THE ANATOMY BELOW IT?

- DETAILS CAN BE OFFSET BY FOLDS
- MOST FABRIC HAVE ONLY SOFT SHADOWS AND NO HIGHLIGHTS
- FABRIC FOLDS IN PARALLEL IN PLACES OF GREATER TENSION
- FABRIC FOLDS PERPENDICULARLY IN PLACES OF LESS TENSION



- FOLDS USUALLY RADIATE FROM A POINT WHERE THE FABRIC IS COMPRESSED
- REMEMBER THAT FOLDS PROJECT SHADOWS ON THE FABRIC ITSELF



## ENVIRONMENTAL HAZARDS

THIS IS MORE LIKE A REFERENCE SHEET THAN A TUTORIAL PER SE.  
MY MAIN THINGS TO LOOK FOR IN A GAME HAZARD ARE:

- A TELL (BEFORE THE ACTION)
- RHYTHM
- DANGEROUS APPEARANCE
- IMPACT

■ EVEN WHEN HIDDEN  
A TRAP NEEDS TO BE  
DETECTABLE

■ I ALWAYS AVOID  
ROTATING PIXEL ART  
■ WHEN POSSIBLE,  
USE MOTION BLUR TO  
FAKE IT

■ RHYTHM AND  
PREVISIBILITY ARE  
IMPORTANT SO THE  
PLAYER KNOWS HOW  
TO AVOID TRAPS

■ RED OR LIGHT GREEN  
ARE GREAT FOR  
DANGER ZONES

■ EVEN STATIC  
OBJECTS CAN HAVE  
SOME ANIMATION,  
THIS MAKES IT  
EASIER TO DETECT  
THEM

■ SOME OBJECTS CAN  
AFFECT THE GAME  
LIGHTING

■ THINK OF THE GAME  
AUDIO WHEN DRAWING?

■ ADD A TELL BEFORE  
THE ACTION

■ A GOOD IMPACT  
WILL SHOW THE  
PLAYER HOW  
DANGEROUS THE  
TRAP IS

■ SHARP SHAPES AND  
SPASMIC MOVEMENT  
CONVEY DANGER

■ FLASHING LIGHTS  
ARE ALWAYS GOOD  
TO SIGNAL DANGEROUS  
THINGS

## CLOUDS

- START BY THINKING IN GROUPS OF SPHERES WITH A FLAT BASE
- MAKE THE LIGHT ON THOSE SPHERES
- AVOID USING TOO MANY PIXEL CLUSTERS
- FLAT COLOR FOR THE BASE
- HUE SHIFT THE SHADOWS
- KEEP LOW CONTRAST

■ SINCE THE SUN IS BEHIND THE CLOUDS IT MAKES A BRIGHT OUTLINE

■ THE SHADOW IS USUALLY BELOW THE CLOUD IN THE FLAT AREA



THERE ARE MANY TYPES OF CLOUDS WITH DIFFERENT RULES, ALWAYS LOOK FOR REFERENCE IMAGES!

- FAR AWAY CLOUDS ARE FADED
- CLOSER CLOUDS HAVE STRONG CONTRAST
- I LIKE TO START FROM THE BACKGROUND AND MOVE FORWARD



# SHADING

## HUE SHIFTING

- WHEN SHADING AN OBJECT IT'S INTERESTING TO CHANGE NOT ONLY THE BRIGHTNESS OF THE COLOR BUT ALSO THE HUE
- MOVE THE HUE TOWARDS THE DARKER OR LIGHTER AREAS OF THE COLOR WHEEL



## BAND COMPRESSION



- TRY TO COMPRESS COLOR BANDS SO IT'S HARDER TO SEE THE STEPS

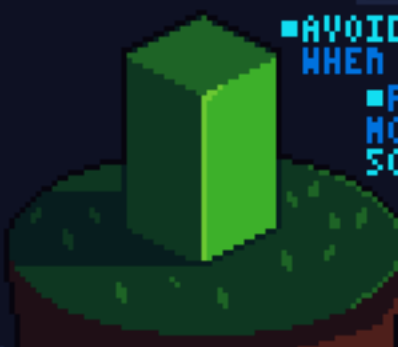


## LIGHTER HUES



DARKER HUES

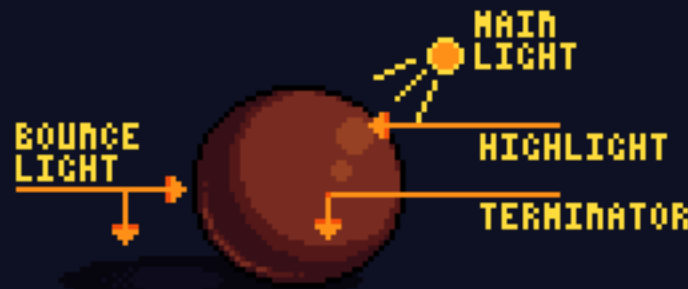
FACES



- AVOID GRADIENTS WHEN POSSIBLE
- FACES ARE MOSTLY ONE SOLID COLOR

SOLID  
FACES

## COMMON CONCEPTS



## OTHER WAYS

- THIS IS JUST THE WAY I LIKE TO THINK WHEN SHADING SPRITES
- THERE ARE MANY OTHER WAYS AND STYLES, LIKE:



NO SHADE



DITHERED



BACKLIT

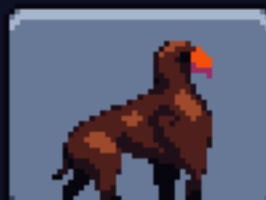


PROJECTED  
SHADOW  
HARD EDGE

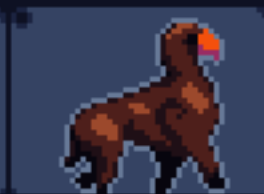
SELF CAST  
SHADOW  
SOFT EDGE

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

# QUADRUPED WALK/TROT



- A GOOD WAY TO SIMULATE A QUADRUPED WALK CYCLE IS TO IMAGINE 2 BIPEDS WALKING WITH A SMALL TIME OFFSET
- I LIKE TO MAKE THE HEAD FOLLOW THE FRONT BIPED WITH A DELAY



■ EVERY 2 FRAMES A LEG TOUCHES THE GROUND IN THIS TROT EXAMPLE (WALKING HAS A LOWER OFFSET)

■ EACH LEG FOLLOWS A PATTERN: ▶CONTACT ▶DRAG ▶RISE ▶FORWARD



FRONT LEG CONTACT ORDER	
4	2
3	1

- NOTE THAT THIS CAN BE MIRRORED
- RUN USES A DIFFERENT ORDER

DIFFERENT ANIMALS HAVE DIFFERENT ANATOMY; HERE'S A GENERIC QUADRUPED WALK CYCLE/ANATOMY STUDY →

## BACK LEG

- THIGHT MOVES REGULARLY
- KNEE JOINT RISES THE FEET
- THE PAW LAGS BEHIND



## FRONT LEG

- SHOULDER MOVES REGULARLY
- ELBOW MOVES FAST ON CONTACT AND RELEASE
- PAW SNAPS ON RELEASE



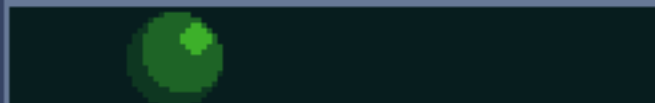


## OUTLINES

OUTLINES TAKES A LOT OF SPACE, SO IT'S A GOOD IDEA TO AVOID THEM IF POSSIBLE WHEN WORKING IN VERY LOW-RES

### SEPARATING SHAPES

- USE OUTLINES TO SEPARATE SHAPES



- THE OUTSIDE BORDER SEPARATES THE SPHERES FROM THE BG
- THE INTERNAL BORDER SEPARATES THE SPHERES FROM EACH OTHER
- INTERNAL BORDER CAN BE LIGHTER



### SELECTIVE OUTLINING

- YOU CAN USE A DARK COLOR INSTEAD OF BLACK FOR A SOFTER OUTLINE
- REMOVE THE OUTLINE IN LIGHTER AREAS FOR AN EVEN BETTER EFFECT



- USE THE OUTLINE TO REINFORCE THE SHADING



### PIXEL-PERFECT



- I START WITH A DIRTY LINE
- CLEAN UP UNWANTED CORNERS
- FIX 2PX LINES



- CHANGE IRREGULAR PATTERNS

### REINFORCE SHAPES

- PIXELS ARE SQUARE AND VERY SHARP, USE THIS TO CREATE POINTY EDGES
- WHILE UNWANTED CORNERS ARE PROBLEMATIC, THEY CAN BE USEFUL TO ADD MORE DETAIL TO LOW-RES IMAGES



SHARP EDGES:



## WALK CYCLE

12 FRAMES

- FLUID ANIMATION
- 6 FRAMES FOR EACH LEG



6 FRAMES

- USEFUL IN LOW RESOLUTION
- 3 FRAMES FOR EACH LEG

EQUIVALENT FRAMES



1 2 3 4 5 6 7...12

↑ ↑ ↑ ↑

IMPORTANT FRAMES

- |   |                 |  |
|---|-----------------|--|
| 1 | CONTACT         | ▶THE FIRST FRAME WHERE THE FRONT LEG TOUCHES THE GROUND            |
| 2 | DOWN            | ▶THE IMPACT CAUSES THE TORSO AND HEAD TO GO DOWN                   |
| 3 | DOWN+           | ▶THE LOWEST FRAME IN THE ANIMATION<br>▶WIDEST POSITION OF THE ARMS |
| 4 | PREPARE PASSING | ▶GET READY FOR MOVING UP<br>▶I ADDED A HEAD DELAY IN THIS ONE      |
| 5 | PASSING         | ▶MOVING UP<br>▶LOTS OF POTENTIAL FOR VARIATION HERE                |
| 6 | UP              | ▶HIGHEST POINT IN THE ANIMATION                                    |

- ▶ARMS ALWAYS MOVE WITH THE OPPOSITE LEG
- ▶LEG ON GROUND ALWAYS MOVES TOWARDS THE BACK

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

# SPACE/STARS

## COMMON STAR SHAPES



## LESS COMMON SHAPES



FOR BG STARS  
I LIKE TO USE  
2 OR 3 COLOR  
VARIATIONS

## TWINKLING STARS

- SMALL COLOR CHANGES
- LOW FRAME COUNT
- NOT ALL STARS SHOULD ANIMATE
- STARS SHOULD BE OUT OF SYNC

SPORADIC BRIGHT  
POINTS GIVE THE  
IMAGE RHYTHM

FADE CLOUDS  
TO STARS

DRAW 2 CIRCLES  
TO MAKE THE  
PLANET SHADOW

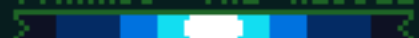
BACKLIGHT

SPIRALS WORK  
GREAT IN SPACE

AVOID CONTRAST  
IN BACKGROUND  
PLANETS

## BIG STARS

■ HUE SHIFT AND  
INCREASE SATURATION  
TOWARDS THE MIDDLE

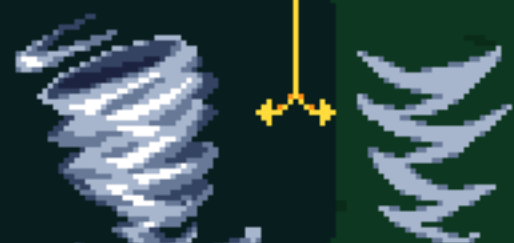


■ CLOUDS HAVE LOTS  
OF SPIRALS THAT  
LOOK LIKE TENTACLES

AVOID 100% BLACK BACKGROUND  
MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## WIND

### ZIGZAG SHAPES



- FAST ANIMATION
- MIX MOVING AND RANDOM PATTERNS
- A LOT OF SPINNING DISKS ON TOP OF EACH OTHER
- DUST IS EMITTED FROM THE BOTTOM AND FADES
- ROTATE ALWAYS IN THE SAME DIRECTION



- USE TWO COLORS TO CREATE DEPTH
- USE LOTS OF SPINNING MOTION
- USE A RING SHAPE AS A GUIDE FOR LOOPS

WE CAN'T SEE THE AIR MOVING,  
SO USE DUST, FOLIAGE AND  
OTHER PARTICLES



- WHEN THE WIND HITS THE FLOOR IT CAN CREATE DUST "WAVES"
- IT CAN ALSO LOOK LIKE A SHELL



## 1-BIT

### DITHERING



- IS THE ONLY WAY TO CONVEY SOFT SHADOWS
- CAREFUL NOT TO OVERDO IT OR IT WILL LOOK MESSY
- THERE ARE MANY WAYS TO MAKE THESE PATTERNS

- AVOID TOO MUCH DETAIL
- USE LINES TO DEFINE THE BIG SHAPES
- USE FEW SOLID SHADOW BLOCKS



- WATCH OUT FOR SINGLE PIXELS, ESPECIALLY ON LINES

SINCE 1-BIT IS SO MUCH FASTER TO WORK WITH, I LIKE TO COMPENSATE THE LACK OF COLORS WITH VERY FLUID ANIMATIONS



- OUTLINES CAN BE WHITE OR BLACK
- IN SOME CASES USE DOUBLE LINES FOR EXTRA CONTRAST



### ICONS

■ THE LACK OF ANTI-ALIAS FAVORS LINES AND REGULAR ANGLES

■ TRY TO DEFINE WHAT IS THE SINGLE MOST IMPORTANT AND RECOGNIZABLE FEATURE OF THAT OBJECT OR IDEA AND FOCUS ON THAT

■ IF IT'S NOT WORKING SCRATCH IT AND TRY SOMETHING ELSE

■ IT'S AN ITERATIVE PROCESS

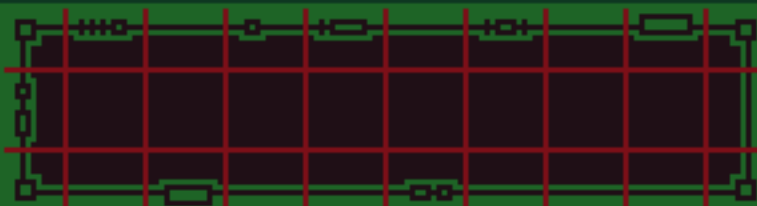


## USER INTERFACE 9-SLICE

- 9-SLICE IS A TECHNIQUE FOR MAKING RECTANGULAR SHAPES, OR BOXES AS I LIKE TO CALL THEM
- THE SIDES SHOULD BE TILABLE TO THE EDGES AND TO THEMSELVES
  - AVOID TOO MUCH DETAIL IN THE MIDDLE AND EDGES
  - CORNERS CAN HAVE MORE DETAILS

### TILING OR STRETCHING

- TO EXTEND A BOX YOU CAN TILE THE EDGES OR EVEN STRETCH THEM
- STRETCHING ONLY WORKS WITH BOXES WITH VERY LOW DETAIL



### VARIATION

- YOU CAN RANDOMIZE (OR CODE) THE EDGE AND THE MIDDLE TILE
- ANIMATING THE BOX CAN ALSO BE A GOOD IDEA

- YOU CAN ADD HEADERS, FOOTERS, ETC

### OTHER USES

- BOXES CAN BE USED AS HEALTH BARS, SLIDERS, DIVIDERS AND OTHER THINGS
- CONSIDER USING 3-SLICES FOR VERTICAL/HORIZONTAL SHAPES

## DARKNESS



- BLEND DARK AREAS WITH THE BACKGROUND TO LET THE VIEWER COMPLETE THOSE AREAS WITH THEIR IMAGINATION

USE THE SHADOWS TO SHOW THAT YOUR OBJECT HAS DEPTH

- START BY MAKING THE GENERAL SHAPE
- MAKE THE LIGHT/SHADOW
- CREATE STRONG LIGHT POINTS
- ADD A STRONG RIM/BACK LIGHT

SHADOWS AND SILHOUETTES CAN BE SCARIER THAN THE REAL THING →



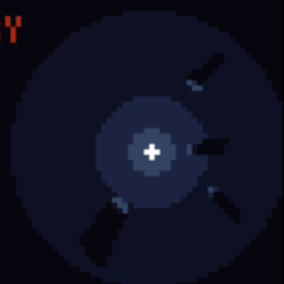
- WHEN DRAWING DARK IMAGES FOCUS ON THE IMPORTANT DETAILS

- EACH PIXEL CLUSTER MUST HAVE A REASON TO BE THERE

- AVOID TOO MUCH DETAIL

- DRAW 2 IMAGINARY LINES FROM THE LIGHT SOURCE TO THE EDGES OF AN OBJECT TO FIND THE SHADOW

- KEEP THE LIGHT DIRECTION ALWAYS CONSISTENT

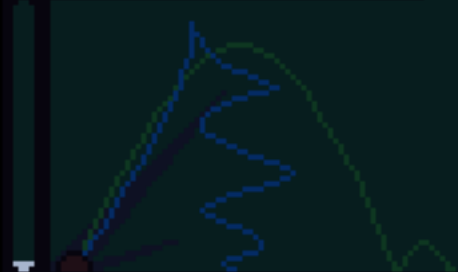


- WHEN DRAWING THINGS IN A DARK BACKGROUND I LIKE TO USE ONLY ONE COLOR TO KEEP A LOW CONTRAST



## BREAKING OBJECTS

### MIND DIFFERENT MATERIALS



### USE OF OVERLAPPING ACTIONS

- FLASH
- SMOKE/DUST
- VASE PARTICLES
- FLOWER PARTICLES



- ANIMATING OBJECTS BREAKING IS NOT HARD, BUT VERY TIME-CONSUMING
- ANIMATE EACH PARTICLE INDIVIDUALLY, ONE BY ONE
- THINK OF YOURSELF AS A PHYSICS ENGINE AND SIMULATE EACH PART

### PROGRESSION

THIS IS HOW I LIKE TO  
SEQUENCE THIS TYPE OF  
ANIMATIONS

#### ■ IMPACT

- MOST OF THE OBJECT IS STILL INTACT

#### ■ EXPLOSION

- JUST LIKE A REGULAR EXPLOSION
- SMOKE, FLASHES AND OTHER EFFECTS

#### ■ SIMULATE PIECES

- USE AT LEAST ONE ORIGINAL SHAPE FOR THE EYE TO KEEP TRACK OF

#### ■ REST



- DRAW FIRST AND LAST FRAMES, SO YOU KNOW THE WHOLE ACTION

- FILL THE MIDDLE FRAMES WITH A FAST MAIN ACTION

- HAVE SECONDARY, SLOWER ACTIONS TO KEEP IT INTERESTING



BE CREATIVE WITH  
THE PARTICLE SHAPES



## MODULAR ANIMATION

- MODULAR ANIMS ARE ESPECIALLY GOOD FOR BIG SPRITES
- SKETCH FIRST
- MAKE EACH PART INDIVIDUALLY
  - DON'T FORGET TO ADD THE PARTS HIDDEN BEHIND OTHERS
- SCALE AND ROTATE THE PARTS TO MAKE THE ANIMATION
- SOME PARTS WILL STILL NEED TO BE ANIMATED FRAME BY FRAME



MODULAR ANIM CAN ALSO BE USED IN SMALLER SPRITES, ALTHOUGH IT'S NOT AS USEFUL



TRY TO HIDE THE PARTS THAT SHOULD BEHIND SOLID MATERIALS USING DIFFERENT MATERIALS AT THE JOINTS ALSO HELPS TO HIDE THE TRICK



■ FOR MACHINES I LIKE TO ADD MULTIPLE LAYERS AND JUST MOVE THEM AROUND ALMOST AT RANDOM



■ AVOID ROTATION AND SCALING WHEN POSSIBLE

## CUTEENESS

### PROPORTIONS

ONE OF THE MOST IMPORTANT ASPECTS OF CUTE CHARACTERS IS HOW THE ANATOMY IS DISTORTED

### EXAMPLES IN LOW RESOLUTION



### FACE PROPORTIONS



REGULAR FACE  
(FOR COMPARISON)



CUTE  
PROPORTIONS

- BIG FOREHEAD
- BIG EYE SOCKETS
- BIG EARS
- SMALL NOSE
- TINY MAXILLA
- WIDE HEAD
- FEWER MARKS

### BODY PROPORTIONS

- USE ROUNDED AND SOFT SHAPES.
- IT WEIGHS DOWN TO THE BOTTOM, LIKE A FLOUR SACK
- BIG HEAD, BIG BELLY, SMALL LIMBS
- CHILDLIKE PROPORTIONS



- USUALLY SHORT (LESS THAN 4 HEADS)
- TRIANGULAR SHAPE
- KEEP USING GENERAL PROPORTION RULES
- OVERSIZED HAIR



### LIMBS

- TRIANGULAR SHAPE, BIGGER AT THE BASE
- SMALL STUBBY FINGERS



- SHINY AND DARK EYES HAVE A VERY STRONG PUPPY EFFECT



### ANIMATING

- MAKE IT EXTRA BOUNCY!
- USE LOTS AND LOTS OF STRETCH AND SQUASH
- EVERYTHING IS SOFT, BEND THE SHAPES



- MAKE EVERYTHING MALLEABLE

THESE ARE NOT RULES, JUST GUIDELINES. "CUTE" IS SUBJECTIVE, AND THERE ARE MANY WAYS TO DRAW IT

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## VEGETATION PART 3

### VARIETY

LOOK FOR PHOTO  
REFERENCES AND  
SEARCH FOR DETAILS  
TO MAKE YOUR PLANTS  
MORE INTERESTING

### BIG LEAVES

- OUTLINE SHOULD  
FOCUS ON THE 3D  
SHAPE AND FOLDS
- CHOOSE A DARK  
AND LIGHT SIDE
- ADD LIGHT  
LAYERS
- ADD SPECULAR  
POINTS ON  
EDGES

■ SLIMY PLANTS  
FALL IN ARCHES

■ SPIRALS AND OTHER  
SHAPES ARE GREAT FOR  
CREATING INTERESTING  
TEXTURES

■ FADE FAR VEGETATION  
TOWARDS SKY COLOR

### TRUNKS

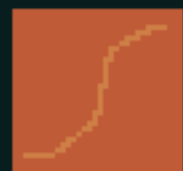
- START BY DEFINING  
YOUR LIGHT/DARK AREAS
- ADD TEXTURE;  
INDIVIDUALLY MAKE  
CRACKS AND LUMPS
- ADD LIGHT POINTS
- ADD A BACKLIGHT OF  
A DIFFERENT COLOR
- I LIKE TO WORK  
ADDING ONE COLOR AT  
A TIME

MOSSY GRASS AND BUSHES  
▶ DRAW THE BASE

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## SAND

### TOP DOWN



- CREATE INDIVIDUAL WAVY PATTERNS WITH HARD EDGES
- THE BOTTOM OF THE HILL HAS A SOFTER SHADOW
- OFFSET THE BIGGER HILL TO THE EDGES AND ADD SMALLER ONES AROUND IT



- WHEN LOOKED UP CLOSE SAND CAN LOOK COARSE AND SPARKLY
- I USE SMALL DITHERED AREAS FOR THIS TYPE OF TEXTURE

COLDER SHADOW  WARM LIGHT

ALWAYS CHOOSE A  
FIXED LIGHT DIRECTION



### DUNES

BASIC SHAPE



← WIND DIRECTION →



- RESPECT THE PERSPECTIVE
- MAKE A WAVY SHAPE
- ADD THE SHADOW

# DEATH / TAKE HIT

## DEATH ANIM.



IMPACT

- THE FIRST FRAME IS THE STRONGEST
- THROWS THE CHARACTER ALL THE WAY TO THE LEFT



RECOVER

- SLOWLY GET BACK TO IDLE POSITION
- FADE BLOOD AND OTHER VISUAL EFFECTS



- STOP RECOVER IN THE MIDDLE
- BEND THE KNEES
- ARMS AND HEAD LAG BEHIND

GIVE UP



HIT GROUND

- ARMS LAG BEHIND; ALMOST HIT THE GROUND
- OVERSHOOT GROUND (+1 PIXEL DOWN)
- ARM BOUNCE
- REST



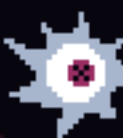
SQUISH

CONSERVE MASS

COMPRESS

MAY REDUCE SPRITE SIZE, BUT TRY TO KEEP IT PLAUSIBLE

THIS WORKS WELL WITH SMALL ENEMIES



CONTRAST FRAME

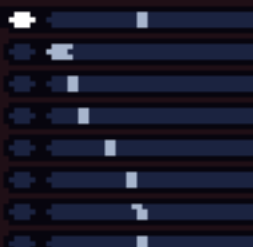
YOU CAN ALSO ADD A BLACK FRAME FOR MORE CONTRAST



EXPLOSION

CHECK MY EXPLOSION TUTORIAL

## HIT ANIMATION



- THE IMPACT IS ALL ABOUT THE CORRECT EASING
- OVERSHOOT THE FIRST FRAME
- THE IMPACT USES ONLY ONE FRAME
- RECOVER SLOWLY BACK TO IDLE

## MODERN / INDOORS

LONG AND SLOW  
LOOPS ARE GREAT  
TO SET THE MOOD

VERY SUBTLE  
LIGHT FLICKER

■AVOID CHANGING  
THE HUE TOO MUCH

■HERE I USED A  
COMPLEMENTARY TWO  
COLOR SCHEME

■BLOCK  
■SIMPLE LIGHT  
■CARVE DETAILS  
■SMALLER PROPS

LOW CONTRAST  
LOW COLOR COUNT  
FOR POSTERS AND  
PAINTINGS

DITHER FOR  
KEYBOARD  
TEXTURE

ADD SMALL ARCHITECTURE  
DETAILS LINE FOOTERS

FOREGROUND FURNITURE  
AND DETAILS HAVE:

■HIGH SATURATION  
■BRIGHT COLORS  
■HIGH CONTRAST

TRY TO ADD HUE  
VARIATIONS TO  
THE WALLS

I LIKE TO KEEP:

■LOW SATURATION  
■LOW TEMPERATURE

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## WALL SLIDE/KICK

### CONTACT



- SQUASH AND STRETCH TO CONVEY THE WALL IMPACT
- COMPENSATE THE HORIZONTAL PRESS WITH A VERTICAL STRETCH

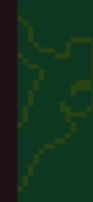
### SLIDE



- I USE VERY SMALL MOVEMENTS TO SHOW THE WIND ON THE CHARACTER
- IF THE CHARACTER HAS A SCARF OR LONG HAIR, USE IT TO SHOW THE WIND DIRECTION
- THERE ARE MANY WALL SLIDE POSES BUT I FIND THIS ONE VERY VERSATILE



### KICK



- ADD DUST FX FOR A BETTER IMPACT
- JUST LIKE A REGULAR JUMP, AVOID ANTICIPATION FOR PLAYER CHARACTERS
- BODY BENDS FORWARD AS MUCH AS POSSIBLE

### BASIC ANATOMY

- YOU USE A LOT OF STRETCH AND SQUASH EVEN WITH VERY BASIC SHAPES

### BASIC ANIMATION FLOW



# SLIDE-ROLL-DASH

## ROLL



- 1 HANDS ON THE GROUND, START THE ROLL POSE
- 2 3 4 5 GET IN THE ROLL POSE AND **SPIN** IT, FIX NOISE AND ADD VARIATIONS TO EACH FRAME
- 6 **OVERSHOOT** RECOVERY
- 7 RECOVER BACK TO IDLE

→ THIS IS AN **OPTIONAL** FRAME THAT ADDS A LOT OF **PERSONALITY**  
→ USE THIS **BEFORE** THE CHARACTER TOUCHES THE GROUND! →

## LURGE



- I USE 2 OR 3 FRAMES LOOP DURING THE DASH TO SHOW THE **MIND**
- LIKE THE ROLL, **OVERSHOOT** THE RECOVERY

→ USE A **SQUASH AND STRETCH** TWEEN TO CONVEY THE **SNAPPY** MOVEMENT

## SLIDE



SLIDE IS VERY SIMPLE, ONE FRAME TO PREPARE, A SHORT LOOP, THEN TWO FRAMES TO RECOVER

← ADDING DUST TRAILS AND MOTION BLUR CAN HELP TO SHOW THE MOVEMENT

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)



**IDEA** ■ REFERENCES CAN COME FROM ANYWHERE, FROM HOUSEHOLD ITEMS TO REAL LIFE CRAFTS



SWITCH  
CONTROLLER



ROTATED  
BUILDING



POPSICLE



SQUID

**THUMBS** ■ THE SILHOUETTE IS THE MOST IMPORTANT ASPECT

■ FUNCTIONALITY IS ALSO KEY, FOR EXAMPLE:

- AERODYNAMICS AND WINGS ARE USELESS IN SPACE
- EACH SCI-FI UNIVERSE HAS ITS OWN RULES
- SHIPS HAVE DIFFERENT NEEDS
- DON'T FORGET TO ADD CONTRAST AREAS TOO



**RENDER** ■ HERE'S WHEN I ADD THE DETAILS AND SHADING

■ I ALSO CHANGE THE SILHOUETTE TO ACCOMMODATE THE NEW DETAILS



**DETAIL  
EXAMPLES**

- WINDOWS
- BEVELS
- ANTENNAE
- REPETITIVE  
PATTERNS
- VENTS
- ENGINE  
EXHAUST



ITERATIVE PROCESS  
REWORK PREVIOUS  
STEP IF REQUIRED

## ICE

REFLECTIONS CYCLE  
THROUGH ICE PLANES

### MY ICE COLOR RAMP

- SNOW LIGHT
- SNOW SHADOW
- ICE GLOW
- ICE BASE
- ICE SHADOW
- ICE DEEP SHADOW

REMEMBER: SNOW DEPOSITS  
ON HORIZONTALLY ANGLED  
SURFACES

- START WITH THE BASIC SHAPE
- ADD A SHADOW REFLECTION
- FIND THE HIGHLIGHT AREA
- MAKE CRACKS AND BRIGHTER AREAS
- ADD SNOW TO THE TOP
- ADD BACKLIGHT

- FOR SNOW I LIKE  
TO USE A SLIGHTLY  
RANDOMIZED  
ZIG-ZAG PATTERN
- WITH SOME ROGUE  
FLAKES THAT EVEN  
GO UP?

- DRIPPING WATER CAN  
CREATE SPIKES BOTH  
FROM THE OBJECT  
AND ON GROUND
- ALSO MAKE THE  
LIGHT AND SHADOW  
DRIP ON EACH OTHER

FOR MORE INFO  
ASK A CANADIAN  
FRIEND

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## DEFEND

A GOOD DEFENDING ANIMATION SHOULD SHOW THAT THE HIT CONNECTS BUT CAUSES NO DAMAGE



### PROJECTILE BOUNCE



- THE BEST WAY TO SHOW THAT A PROJECTILE CONNECTED BUT DIDN'T CAUSE DAMAGE IS TO MAKE IT BOUNCE OR FALL OFF
- ONLY THE SHIELDED AREA SHOULD REACT

- BULLET CONNECTS
- LITTLE EXPLOSION
- BRIGHT LIGHT ON SHIELD
- SMALL IMPACT MOVEMENT
- SHIELD SHINES



### ARMOR



- SMALL MOVEMENT ON HIT
- LONG RECOVERY TIME
- ARMOR SHINE ON HIT
- THE AFTER SHINE SHOWS THE PLAYER THAT THE ARMOR IS STILL INTACT
- DON'T MOVE THE SILHOUETTE TOO MUCH

### ABOUT SOUND

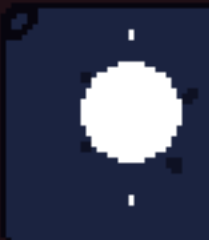
ALWAYS THINK ABOUT THE SOUND THE HIT WILL MAKE  
THE ANIMATION SHOULD MATCH AND COMPLEMENT IT



**BUBBLE EXPLOSION** A HIT-CONNECT EFFECT THAT IS NOT AS AGGRESSIVE AS A REGULAR EXPLOSION

- AVOID ADDING SHRAPNEL OR IT WILL LOOK LIKE IT'S BREAKING THE ARMOR
- USE ROUNDED AND CIRCULAR SHAPES
- SHORT ANIMATION

OPTIONAL COMPLEMENTARY FLASHING



CONTRAST FRAME

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## COLD COLORS



USUALLY I PREFER USING COLD COLORS. WARMER COLORS CAN BE USED, BUT WITH LOWER SATURATION

## MONOCHROME

BOTH GHOSTS AND HOLOGRAMS USUALLY HAVE ONLY ONE MAIN COLOR

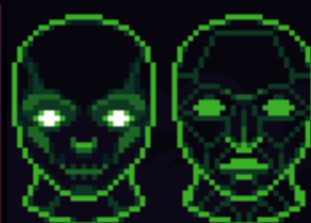
## FRAGMENTATION

- CHOOSE A PARTICLE SHAPE
- JUST LIKE ANY PARTICLE SYSTEM SIMULATE ONE BY ONE, IN A LOOP
- PARTICLES SHOULD GET DARKER/TRANSPARENT AND SMALLER
- PARTICLES START FAST AND SLOW DOWN

## TRANSPARENCY

IF YOU CAN'T OR DON'T WANT TO USE SEMI-TRANSPARENCY, FOCUS ON OUTLINES AND DETAILS ON:

- OUTLINES
- EYES
- MOUTH
- NOSE



## WIREFRAME

DRAW LINES MAKING POLYGONS SIMULATING FACES OF A 3D MESH

(I MADE ANOTHER TUTORIAL ABOUT GLITCHES?)

## FLOATING

I LIKE USING A SINE WAVE TO MOVE THE WHOLE HOLOGRAM/GHOST UP AND DOWN



$Y = \text{MATH.SIN}(\text{TIME})$

## GUN ANATOMY

■ HERE'S SOME IMPORTANT GUN PARTS TO  
KEEP IN MIND



LEARN PISTOLS FIRST,  
BECAUSE RIFLES AND  
OTHER BIGGER WEAPONS  
USUALLY ARE JUST LIKE  
BIG PISTOLS WITH EXTRA  
STUFF ON IT



## INVENTING WEAPONS

### 1=EXAGGERATION

- GREAT FOR CARTOON WEAPONS
- EXAGGERATE THE SIZE OF PARTS OF THE GUN
  - THIS EXAMPLE HAS A BIG SLIDER AND A SMALL GRIP
- EXAGGERATE THE NUMBER OF ELEMENTS
  - THIS EXAMPLE HAS A LOT OF SCREWS
- ADD ATTACHMENTS LIKE LASER SIGHT AND SCOPES



### 2=FUNCTION

- START WITH A RANDOM SHAPE
- THINK ABOUT WHAT EACH PART OF THE GUN IS USED FOR
- IMPORTANT THINGS TO REMEMBER
  - MUZZLE (WHERE THE BULLET LEAVES)
  - MAGAZINE (WHERE THE BULLET IS STORED)
  - GRIP (WHERE YOU HOLD THE WEAPON)



### 3. BE CREATIVE! (AND RESEARCH)

- THERE ARE MANY TYPES OF GUNS AND THEY CAN BE MIXED AND MASHED TOGETHER



## GEMS

### BASIC GEM CUTTING



**ROUGH**  
THE STONE CUT  
AND BROKEN BY  
NATURE OR BY THE  
MINING PROCESS



**PRESHAPING**  
THE STONE IS  
CUT AND GROUND  
INTO A BASIC  
SHAPE



**CUT GEM**  
A POLISHED  
AND FACETED  
GEM, THE  
FINAL STAGE

### COMMON FACETING STYLES

**BRILLIANT**

**CUSHION**

**CABOCHON**



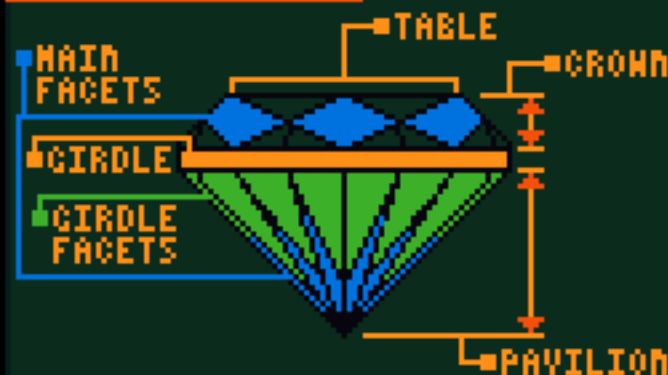
- SKETCH
- FOCUS ON MARKING THE FACETS
- REMOVE LINES
- BASIC SHADING
- ADD REFRACTION
- THEY CAN BE A LITTLE RANDOM
- CAREFUL WITH THE NOISE

### SHINE ANIMATION



- WHEN POSSIBLE, MAKE EACH FACET SHINE WHOLE
- THE LIGHT IN THE MIDDLE FRAMES COVERS A MUCH LARGER AREA
- LIGHT ON SMOOTH SURFACES SHINE WITH ROUNDED SHAPES BUT ALSO MOVES WITH THE SAME EASING

### GEM ANATOMY



### COLORS



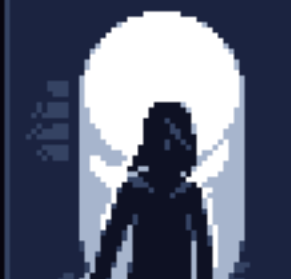
# ILLUMINATION TECHNIQUES

## 3-POINT LIGHTING



**KEY LIGHT:** THE MAIN LIGHT;  
CASTS THE MAIN SHADOW  
**FILL LIGHT:** SOFTENS THE  
SHADOWS  
**RIM LIGHT:** CREATES A THIN  
OUTLINE TO SEPARATE THE  
OBJECT FROM THE BACKGROUND

## CONTRE JOUR



THIS STRONG  
**BACKLIGHT**

## FROM BELOW



- GREAT FOR HORROR THEMES AND TENSE SETTINGS
- HAS A STRONG EFFECT ON FACES BUT ALSO WORK ON OTHER THINGS
- COLORED LIGHTS ARE GREAT FOR THIS

HIDES DETAILS AND  
CAUSES A STRONG  
CONTRAST FRAMING THE  
OBJECT IN THE CENTER

## BACKGROUND CONTRAST



- GREAT FOR EXTRA CONTRAST
- MAKE THE BACKGROUND DARK ON THE BRIGHT SIDE OF THE CENTRAL OBJECT
- KEEP THE BACKLIGHT ON THE LIT SIDE OR THE LIGHT WILL FEEL WRONG

## HUE SHIFT

- CHANGE THE HUE WHEN CHANGING THE AMOUNT OF LIGHT
- USE COMPLEMENTARY LIGHT COLORS FOR A STRONG CONTRAST



## VOLUMETRIC LIGHT



- LIGHT CONES ARE VISIBLE IF ENOUGH DUST OR SMOKE ARE PRESENT
- THE CONE IS BRIGHTER IN THE MIDDLE

WHEN POSSIBLE USE PHOTOS  
AS REFERENCE?

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## RESIZING PIXEL ART

SCALING AND ROTATING PIXEL ART SHOULD ALWAYS BE AVOIDED, TO DO IT PROPERLY THERE'S NO EASY ESCAPE, YOU NEED TO REDRAW IT. SOME AUTOMATIC RESIZE ALGORITHMS CAN HELP BUT DON'T RELY TOO MUCH ON THEM



### SCALING FROM CONCEPT

- THINK OF IT MORE AS A TRANSLATION THAN AS A RESCALING



- FOCUS ON THE BIG MASSES FIRST
- CHOOSE STRONG DETAILS LIKE THE SHOULDER GUARD AND THE BUTTONS ON THE COAT
- ADD DETAILS AND CONTRAST TO THOSE AREAS WHILE KEEPING THE OTHER AREAS CLEARER

### CHOOSING A RESOLUTION



- AS THE RESOLUTION DECREASES YOU NEED TO START CHOOSING WHAT DETAILS ARE IMPORTANT

- HIGHER RESOLUTIONS USUALLY HAVE MORE COLORS TOO

- SOMETIMES YOU NEED TO LET GO OF SOME DETAILS, LIKE THE FACE IN THIS EXAMPLE

- BIGGER RESOLUTIONS ALLOW MORE REALISTIC STYLES AND ROUNDED SHAPES

### ADJUSTING SCALE



ORIGINAL

1. USE AUTOMATIC RESIZE
2. FIX OUTLINE AND SILHOUETTE

#### DOWNSCALING

3. REDRAW MISSING INFO
4. CHOOSE DETAILS TO OMIT IF NEEDED
5. FIX DITHER AND BROKEN SHADING



#### UPSCALING

3. HURT DOWN BIG SQUARES AND MAKE THINGS ROUNDER



4. REDRAW BROKEN LINES AND DITHER
5. FIND AREAS TO PUT EXTRA DETAILS

I RECOMMEND DOWNLOADING THIS GIF AND WATCHING IT STEP BY STEP

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)



## WOOD

### NATURAL WOOD

- ▶ START WITH THE BASIC SILHOUETTE USING A MEDIUM COLOR WITH SOME VERY BASIC SHAPES
- ▶ ADD SHADOWS AND AVOID PILLOW SHADING
- ▶ MAKE THE STUMP RINGS, FADING DETAILS WITH DISTANCE
- ▶ START THE BARK TEXTURE LIKE IT WAS MADE OF INDIVIDUAL SCALES
- ▶ LIGHT THE SCALES NOT ONLY INDIVIDUALLY BUT AS A SINGLE SHAPE
- ▶ ADD EXTRA ELEMENTS SUCH AS CRACKS AND GRASS

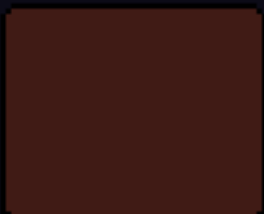
### PLANKS

- ▶ START BY FOCUSING ON THE BIG SHAPES, AND BEVELS
- ▶ ONLY MAKE TEXTURES AND DETAILS AFTER THAT
- ▶ INCREASE CONTRAST ON THE INTERSECTIONS

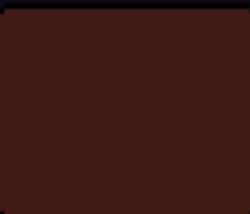
### COMMON ELEMENTS



KNOTS



NAILS



CRACKS



BARK

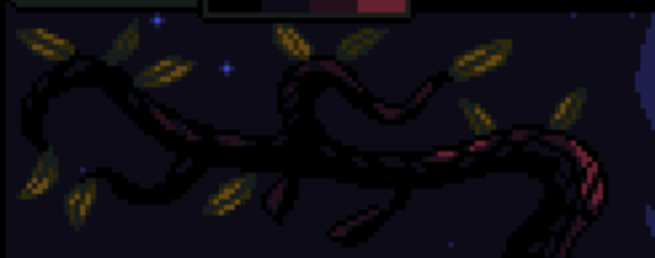


MOSS/PLANTS

### COLORS

- ▶ HUE SHIFT THE SHADOW
- ▶ USE SLOW TRANSITIONS
- ▶ CONSIDER THE LIGHT COLOR
- ▶ DON'T OVERDO THE HIGHLIGHT

### EXAMPLE PALETTES

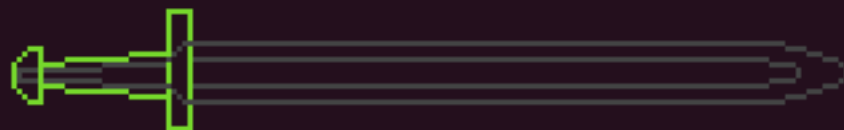


MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## SWORDS

THERE ARE SO MANY TYPES OF SWORDS AND I CAN'T POSSIBLY COVER THEM ALL, SO I CHOSE SOME FAVORITES TO EXPLAIN IN HERE

### SWORD ANATOMY VIKING AGE SWORD



#### STANCE

THERE ARE MANY WAYS TO WIELD A SWORD, HERE ARE SOME EXAMPLES



Plow  
Guard



Outside  
Guard

#### ATTACKING



MOST ATTACK ANIMATIONS CAN BE BROKEN DOWN IN 3 PARTS:

#### WIND-UP



- BEST FOR NPCs
- USUALLY AVOIDED FOR PLAYER CHAR

#### OVERSHOT



- EXAGGERATED
- MOTION BLUR
- WIND FX

#### RECOVER



- CAREFUL WITH FEET AND LEG MOVEMENT
- LONGEST AND SLOWEST PART

MORE STUFF → [PATREON.COM/SAINT11](https://patreon.com/saint11)

## TOP DOWN WALK CYCLE



- Start with the idle frame
- Remember the perspective: feet behind legs, legs behind torso, torso behind head...

### BASIC 6-FRAME CYCLE



- Move one leg forward while moving the arm on the same side back
- Then flip those 3 frames horizontally for the other leg movement



### MAKING IT SMOOTHER

- Duplicate every frame and make an intermediate action
- With the extra frames you can add more personality and bounciness



### WALKING UP

- Less aggressive vertical movement on torso and head
- Same logic of front anim



### SIDEWAYS

- Use strong contrast points on hand and feet
- Similar to a platform walk cycle



# ISOMETRIC PART 1

## GRID



- This is a 2:1 ratio: for every 2 horizontal pixels you should move vertically by one pixel



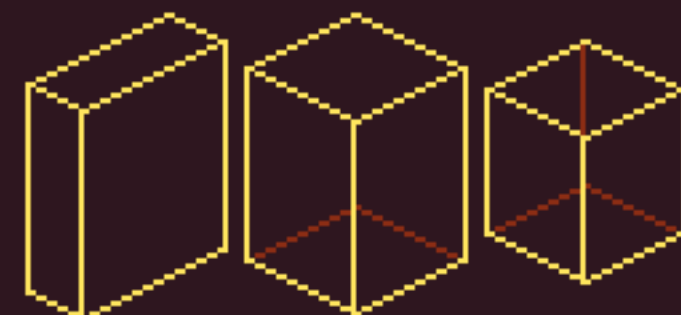
- Vertical lines are always straight



- You can freely move iso objects without worrying about the perspective

- Lines can be replaced by transitions and bright corners

## CARVING



- Use cuboids to create basic shapes and carve the desired shape out of it

- Apply texture after the basic shape is solved

## CONVERTING FROM FLAT



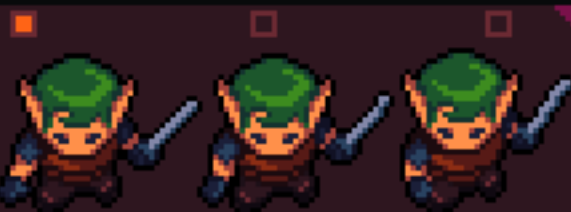
- Sometimes it's easier to draw something flat and then convert to iso

- This is a useful tool, but don't rely only on this

## TOP DOWN ATTACK



- Think of stacked layers lunging forward
- Don't forget to move the opposing arm/leg
- Keep one foot grounded
- Try rotating the head (just a little)



### ANTICIPATION

- Move weapon in the opposite direction of the attack
- Usually avoided when drawing player characters



### SLASH

- The first frame should do the full motion
- Slowly stabilize while reducing the motion blur



### RECOVERY

- Recover in a different motion arc than the attack
- I like to overshoot the recovery in the last frame

overshoot ↗

## SORTING



`method on_late_update()`

`order_in_layer = pos.Y + offset`

- The offset should be generally on the bottom of the collision box
- Floating objects have the offset on the position they would touch the ground



## COMPLEX SHAPES

- You will need to break up vertical shapes into multiple objects/tiles
- Each object will have its own y-sorting method
- Place each offset where that part would hit the ground



## COLLISION

- Similar to the offsets, it's like a ground projection of what it would be in 3-D
- When not sure, a large collider can hide y-sorting issues

## LAYERS

Used to  
separate  
major groups



## EXAGGERATION



- Motion blur
- Smoke particles
- Shrapnel/Debris
- Things affected by gravity

## Anatomy of an Impact



## ANTICIPATION AND PAYOFF



- Anticipation makes the motion feel stronger
- Make the target object bounce and react properly
- Shake camera and target

## CUT OUT THOSE FRAMES!



- Remove frames between rest and target position for a faster and stronger movement
- Add lots of motion blur to illustrate the movement

## FREEZE TIME



- I like to pause one frame before the impact
- Do not pause for too long
- Use only for very exaggerated impacts

# JUMP

## JUMP UP/FORWARD



I like having 2 animations for jumping

**UP** is when starting  $X\_SPEED=0$

**FORWARD** is when starting  $X\_SPEED>0$

Don't forget dust and particles!



## 3. INVERT

When changing the Y speed, use this as a bridge between up and fall



## HANDS

This is a fast animation, use hands with high contrast to track the movement

## 2. GOING UP!



Simple animation, doesn't loop

## 4. FALL



- Arms go up, head looks down
- Hair, cloth and other objects Flap in the wind

## 1. ANTICIPATION?

Avoid on player controlled characters



## 5. CONTACT



- Squash as much as you can on contact
- This can be a long animation that's interrupted if necessary