

## Simple boned character

- draw bones in leg and rest of body (use systems of 3 bones)
- apply the HI Solver (but from foot bone to the thigh bone instead)
- (and from the tip of the toe bone to the heel)
- do the same HI Solver in the hands to the upper arms (may reverse so arms follow the body)
- place a Point over each of the hips, heels, toes and hands Use a large box as the Point and place a point on the base of the spine called a Trunk Point Note: Make points from the Top View.
- Link the lower spine bone to the Trunk Point
- link upper legs to the Hip Pointer (must use pointers or solvers will not work properly)
- link the Hip Pointers to the Trunk Pointer
- link upper arm to a shoulder bone
- link goals to the Points in Toes, Heels, Hands
- link Toe point to Heel point (allows for no rotation in the foot while heel is moved)
- link the hand points to the Trunk Point
- Use the point in the hip for movement up and down and forward
- Points should be used instead of Helpers as they can be scaled etc with out losing their relationship

## Walk Cycle

Walking conveys a great deal about ones personality. The next time you're in a crowded place, notice all the different types of walks that people have. Almost everyone has his or her own unique walk.

Walking has been described as "**controlled falling**". Every time you take a step, you lean forward and fall slightly, and are caught by your outstretched foot. If you failed to put your foot forward, you would fall flat on your face. After your foot touches the ground, your body's weight is transferred to it and your knee bends to absorb the shock. The front leg then lifts the body and propels it forward as the rear leg swings up to catch you again, and the cycle repeats.

Walking is complex. Not only do the feet have to move across the ground, but the hips, spine, arms, shoulders, and head all move in sync to keep the system in balance. Although these movements are complex, if you break them down joint by joint, the mechanics of walking become clear.

### **The following sections break down a basic walk, step by step.**

The feet and legs propel the body forward.

To keep your character looking natural, you should always keep the joints bent slightly, even at full leg extension.

The body's center of gravity is at the hips; all balance starts there, as does the rest of the body's motion. During a walk, it's best to think of the hips' motion as two separate, overlapping rotations. First, the hips rotate along the axis of the spine, forward and back with the legs. If the right leg is forward, the right hip is rotated forward. Second, at the passing position of the legs, the free leg pulls the hip out of the center, forcing the hips to rock from side to side. These two motions are then transmitted through the spine to the shoulders, which mirror the hips to maintain balance.

Unless the character is holding something or gesturing, its arms hang loose at the sides. When walking, they act like pendulums, dragging a few frames behind the motion of the hips and shoulders. Even at full extension, try keeping the arms slightly bent at the elbows, to make them look natural.

If you look at a character's spine from the side, you can see its general posture, which may be very stiff or slouched over, depending on the character's attitude. The spine also absorbs some of the shock transmitted to the hips from the legs, making it flex from front to back a bit.

In a standard walk, the head tries to stay level, with the eyes pointing in the direction of the walk, but it bobs around slight to stay balanced.

## **Animating the Walk**

How many frames does it take? That's not an easy question to answer. Is your character large and lumbering or small and scrappy? Is you character running or walking? Happy or sad? All of these factors will determine the time it takes your character to take a step.

A normal walking gait will take anywhere from one-third to two-thirds of a second per step, (10 to 20 frames at 30fps) with a half second per cycle. Larger characters tend to walk slower and smaller characters walk faster. In general, men have slightly slower gaits then women and sad people walk slower then happy people.

The most important thing to remember when animation a walk is to keep you character's feet firmly locked to the ground. The friction between the feet and the ground propels him forward. If the feet slide around, the illusion of the friction is lost and the animation will not seem realistic.

### **4 poses for a RUN Cycle at different frames**

- 0 – full run, left leg and right arm forward
- 5 – half way to next step, right leg forming the arrow figure or #4 with the Left leg straight
- 10 – full run, mirror of 0
- 15 – half way to next step, mirror of 5
- 20 start repeat – grab all body parts, shift and drag on the time line (last keyframe) then start tweaking to make a more believable character.

## Resources

Richard D Williams – Animation Survival Tool Kit (good to buy)

Check out Keithlando.com

Check out Laszlo meshtools in google for a sped up version of making a face

Free Program to use on Wings3d.org

Textporter version 3.4 is a free download plugin for UVW Unwrap painting

Always use a picture etc for reference when modeling

Use Dice program for demo of UVW Unwrap exercise

- draw shape and get to calc map coordinates
- convert to edit poly
- apply UVW Unwrap
- open Unwrap UVW to select face
- Click planar map
- go to edit and move out of the square
- continue to all objects are in edit UVW window
- repack objects into the square under tools
- turn off backface Cull on Textporter
- make square by 512 X 512
- save picture and open in paint
- place in materials
- Note: stitch the object together like the shoe example
- note: more complex objects need to define how to map the surface

## Materials

- Ink and Paint – good to use
- no need to have too many folders as you can just add a new material
- need to try this one again
- Mirror is a raytrace on a reflection map (turn everything to white)
- Refraction for glass is a raytrace on a refraction map

## Lights

- Directional lights simulate Sun
- place raytrace shadow on that are tinted yellow
- Skylight – light comes from everywhere
- must use light tracer from advance lighting
- makes excellent scenes

Run Cycle – Basic Character good for FNASK 11 no bones

- linked character not boned
- 2 parts to foot, 2 to leg, 2 arms, 1 hand, 3 to torso
- link upper body to center of mass Point
- feet and legs linked to center of mass Point as well
- Center of Mass Point linked to Point under floor to move the object forward
- Center of Mass Point used to move the object up and down

## 4 poses

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#### Editable Poly

- use backspace to remove vertexes, edges with out damaging the mesh
- when making round objects use multiples of 4 for the number of sides
- meshsmoothing - use smoothing groups so doesn't smooth all areas
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