**Project 4 a**

**Outline   
  
Three point Lighting**

* **Lighting is adding lights to your scene so you can see what it’s happening, can also add moods and be a story telling device**
* **What is three-point lighting?** 
  + Key light
    - Generally shadow casting light

Main light source

* + Fill Light
    - Fill in shadows, compliment of key usually (color), lower intensity.
  + Rim light
    - Generally higher or equal to key intensity.
* **EXPLAIN ARNOLD**
  + Software in maya used for lighting and rendering,(shading and texturing)
  + Has it’s own lights, and maya has lights as well
    - **MAYA AMBIENT AND VOLUME LIGHTS DO NOT WORK WITH ARNOLD(DON’T USE THEM, THEY WILL NOT SHOW UP)**
    - **Arnold lights all work**
  + **IF ARNOLD DOES NOT APPEAR GO TO WINDOWS-PLUG IN MANAGER- TURN ON MTOA**
* **Creating the Key Light** 
  + **Key light-** Is the subject’s main source of illumination and defines the most visible shadow. **Create a key light: Create>Lights> Spotlight**
  + **Name key light “pawn\_key” & create a light group**
    - Outliner
    - Group key light as “lights” in outliner. **CTRL + G  
      -Name group “lights”**
  + **Place the light** at position (x, y, z) = **(13, 27, 21)**  
     -Key lights are generally placed above the camera either on the left or right hand side, depending on where the main light source is coming from.
  + The first way to position a light:   
     -Use the **t** key to show turn on the light’s manipulator tool. Place the target inside the pawn.(only on maya lights, not Arnold lights)
  + **Opening the light relationship editor**
    - Go to windows – relationship editor – light linking - light centric
      * Note: both light-centric and object-centric achieve the same results, just depends on how you would like to work, object based or light based
  + In the Attribute Editor, change the **Intensity** of the light to **4500** and the color (H, S, V) to **(60, 0.134, 1)**.  
     -**Intensity** is how bright the light is going to be.   
     -**H=Hue**: The color or shade of the light.  
     -**S= Saturation:** A range of 0%-100% of how pure the color is. Usually color looks duller when less saturated.  
     **-Value** is how bright or dark the color is and represents the grayscale.
* **Render Image**
  + **What is rendering?**   
     -Rendering is a process of generating an image of a model using computer software and give the final appearance of shading, texture, shadows, reflections and motion blur.   
     -**Arnold**: Has more functions to calculate motion blur, supports raytracing for shadows, creates caustics and creates physically correct simulation of global illumination (diffuse, glossy, specular reflection)   
    **Render view vs Arnold render view**
    - Arnold render view renders in real time, just starts with low samples and gets higher, good for testing how lights are working in a scene, but can be a bit more buggy
      * Open with Arnold- open Arnold render view
    - Render view renders the whole image at once, can be good if you are just checking samples
      * **WARNING: USING IPR(LIVE RENDERING) AND SAVING AT THE SAME TIME WHILE AN IMAGE LOADS CAN POTENTIALLY CORRUPT YOUR FILE**
      * Open with button
      * With basic render view, make sure you select Arnold Renderer instead of the default(usually is maya software)
  + **FOR THIS ASSIGNMENT STICK TO THE ARNOLD RENDERVIEW**
    - It has more options and works better for Arnold renderer
  + Setup render
    - Open render settings
      * Render- Render settings
      * Also a button for it at the top
      * Make sure it’s using arnold
    - **Select Camera**: Renderable camera- select render\_camera
    - Other tools in render
    - Arnold Renderer tab (samples)
      * Camera is an exponential increase that increases all properties below it by it’s number
        + If Diffuse is 3 and Camera is 3, then diffuse is actually 9
      * Good to set camera to 3 and the remaining to 2 for now

* Set the Cone Angle to **20**, the Penumbra Angle to **25**, and the Dropoff to **0.5**. This will give a nice, soft edge to the Spotlight.  
    
   **Cone Angle**-The size of the light’s cone angle. The higher the number, larger the cone angle size will be.   
    
   **Penumbra Angle-** The softness and hardness of the light fall. It is part of the shadow where light makes it past whatever is casting the shadow. Higher the Penumbra angle, the softer the edge will be for the spotlight.  
    
   **Dropoff-** The rate of which light degrades as it moves through space.
* Render Image
* **Attribute Editor**.   
  + Under **Arnold**
    - Check **cast shadows**
    - Change Radius to 1.569
      * Radius Softens the hard edges on shadows
    - Change samples to 4
      * Ups the quality of the shadows and image quality
        + Will take longer to render if you bump these up too much
    - **OTHER TOOLS FOR SHADOWS**
      * Shadow density
        + Dims shadow opacity
      * Aspect ratio
        + affects edge of light, brings shadows farther in horizontally
      * Lens radius
        + Affects edge of light vertically

* **Creating Fill Light**
  + **Fill light-** Used to fill in shadows, is a lower intensity than key. Doesn’t create shadows. Can lower light intensity in the real world by moving light back, using reflectors or light diffusers.
  + **Create second spot light.** 
    - Rename in outliner.
    - Place the fill light at **(x,y,z)=(-19,17,20).**
    - Select panels and use **Look through Camera** to point light at the pawn.
    - **Intensity** to 4000, the **Cone Angle** to 40, the **Penumbra Angle** to 0, the **Dropoff** to 1.25, and the **Color** (H,S,V) to (240, 0.388, 0.721).
      * H=Hue
      * S=Saturation
      * V=Value
    - Under Arnold in the attribute editor
      * Under visibility change specular to 0
        + This will get rid of the specular highlights on the pawn
      * Uncheck cast shadows
* **Creating Rim Light**
  + **Rim Light-** 
    - The rim light provides definition to the silhouette of your subject and helps separate it from the background
    - Create another spotlight
    - Name it “pawn\_rim”
    - position **(x,y,z)=(-4, 14, -25)**
    - **Intensity** to 6000 and the **Color (H,S,V) to (60, 0.366, 1)**.
  + **Harsh cone of light on ground.**
    - **Uncheck “illuminate by default”**
      * Illuminate by default attaches the light to every object in the scene
        + In the light editor attach the pawn rim to the pawn
  + Uncheck cast shadows
* Render out image when done.
  + File-save image
* **Other things to mess with**
  + **Under visibility these control various settings that you can make more or less visible**
    - Diffuse: how light is spreading/reflecting across an object
    - Specular: a highlight created by a light and based on whatever material/shader the object is made of
    - SSS: Sub-surface scattering, when light enters an object and is visible from the outside
    - Indirect: light bouncing from one object/another part of an object to another
    - Volume: how light is affected when fog or another atmosphere effect is present

**Moods**

Now you are going to create 3 moods to convey through lighting, Joy, Anger, and Sadness.

Try:

* Moving lights around
* Changing intensity
* Changing color
* Changing shadow settings

Do your best to convey to the person looking at the pawn the kind of mood you are trying to achieve!