







Multiple Category Scope and Sequence: Scope and Sequence Report For Course Standards and Objectives, Content, Skills, Vocabulary

Wednesday, August 20, 2014, 12:20PM



	Unit	Course Standards and Objectives	Content	Skills	Vocabulary
<p>District Intermediate <u>3D Graphics</u> (11.0215) (District) 2014-2015 <u>Collaboration</u></p>	<p><u>3d Software User Interface</u>  (Week 1, 2 Weeks) </p>	<p>UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 2 Students will create a basic 3D model as an introduction to the 3D development process.</p> <ul style="list-style-type: none"> ▪ Objective 1 Introduce basic 3D terminology and the 3D application interface. <ul style="list-style-type: none"> a. Know 3D terminology b. Identify parts of the 3D application interface 	<p>Students should know what common elements and tools 3d software packages share.</p>	<p>Students should be able to open any 3d application and quickly find basic views and object creation and editing tools</p>	<p>Perspective Orthographic Primitive Polygon Sub-D NURBS Translate Rotate Scale Shader Texture Academy Award</p>
	<p><u>Animation History/ Short Films</u>  (Week 1, 19 Weeks) </p>	<p>UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 1 Students will identify the applications of 3D Graphics and Animation through exploring the career opportunities and the relevant history of the industry.</p> <ul style="list-style-type: none"> ▪ Objective 2 Develop career awareness related to working in the 3D graphics and animation industry. <ul style="list-style-type: none"> a. Identify personal interests and abilities related to 3D Graphics careers, such as: 1) Identify personal creative talents, 2) Identify organizational and leadership skills, 3) Identify special interest areas b. Identify 3D graphics and animation job titles, such as: Animator, Industrial Designer, 3D Modeler, Technical Director c. Investigate career opportunities, trends, and requirements related to 3D graphics and animation careers 	<p>Students should understand story structure.</p> <p>Students should recognize 3d animation.</p> <p>Students should recognize 2d animation.</p> <p>Students should recognize stop motion animation.</p>	<p>Students should analyze story structure.</p> <p>Students should recognize character tropes.</p>	<p>Short Film Feature Film</p>

- d. Identify the members of a 3D graphics and animation team
- e. Investigate trends associated with 3D graphics and animation careers
- f. Develop a realistic Student Education Occupation Plan (SEOP) to help guide further educational pursuits
- g. Identify factors for employability and advancement in 3D careers
- h. Survey existing 3D graphics and animation businesses to determine what training is required
- i. Survey universities and colleges to determine programs, degrees and training availability
- j. Develop employability competencies/characteristics: responsibility, dependability, ethics, respect, and cooperation
- k. Achieve high standards of personal performance with a positive work ethic and attitude
- Objective 3
 - Discuss the relevant history of the 3D graphics and animation industry. (See PowerPoint)
 - a. Identify Early 2D animations on film
 - b. List Key mile markers in animation
 - c. Identify Key figures and animators in animation history

Basic Modeling 
 (Week 3, 2 Weeks) 

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 2
 Students will create a basic 3D model as an introduction to the 3D development process.

- Objective 1
 - Introduce basic 3D terminology and the 3D application interface.
 - a. Know 3D terminology
 - b. Identify parts of the 3D application interface
- Objective 2
 - Create a 3D model. (Include modeling, surface materials, camera, lighting, moving, scaling, and rendering)
 - a. Include modeling
 - b. Add surface materials
 - c. Set cameras and lighting
 - d. Move and scale the model
 - e. Render the model.

Students should recognize primitive shapes; cone, sphere, cube, pyramid, cylinder, and torus.

Students should know what a polygon is made up of.

Students should know what a vertex is.

Students should know what an edge is.

Students should know what a face is.

Students should be able to create simple shapes.

Students should be able to manipulate individual pieces of those shapes.

Students should be able to place simple shapes at various angles, sizes, and locations.

Students should start to build more complex shapes out of simple shapes.

- Primitive
- Cone
- Cube
- Torus
- Cylinder
- Pyramid
- Vertice
- Edge
- Face

Standard 3
 Students will model 3D objects.

- Objective 1
 - Use and manipulate 3D graphics and Primitives.
 - a. Use 3D primitives

- b. Manipulate 3D models and primitives.
- Objective 2
Create, use and manipulate shapes.
 - a. Create 3D shapes
 - b. Use 3D shapes
 - c. Manipulate 3D shapes
- Objective 3
Edit models.
 - a. Use Extrusion
 - b. Use Boolean
 - c. Use Beveling
 - d. Use Lathe/Revolve
 - e. Add and remove Grouping
 - f. Understand Model Hierarchy (parent/child)
 - g. Use Reshape/Convert
 - h. Use Duplication/Mirroring
 - i. Understand and use Pivot/Origin Points
 - j. Make a surface from Curves (lofting/skinning)
 - k. Subdivision a model
 - l. Modify edges, faces, vertices
 - m. Use a reference graphic/image/drawing (background)
 - n. Edit an object after its been created (history)
 - o. Use other software specific tools

Environment

Modeling

 (Week 5, 2

Weeks) 

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 2
Students will create a basic 3D model as an introduction to the 3D development process.

- Objective 3
Create an environment/background.
 - a. Create an environment for a 3D project
 - b. Create a background for a 3D project

Students should understand scale and how it relates to environment.

Students should know how to appropriately use environments.

Students should know how to appropriately use backgrounds.

Students should know different shaders available in most 3d software packages.

Students should understand proper use of reflective material.

Students should model a background.

Students should map a picture to a surface for use as a background.

HDRI

Image Plane

Displacement Maps

Basic Texturing

 (Week 7, 2 Weeks) 

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 4
Students will apply surface materials to 3D models.

- Objective 1
Create, Apply and edit surface materials.
 - a. Add & edit Color
 - b. Add & edit Texture
 - c. Add & edit Procedurals
 - d. Change Luminosity
 - e. Use Transparency
 - f. Work with Reflective
 - g. Add & edit UV Mapping

Students should know different shaders available in most 3d software packages.

Students should understand proper use of reflective material.

UV Map


Layer

Lambert

Phong

Blinn

Procedural

Basic Environmental Lighting  (Week 9, 1 Week) 

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 5
Students will apply lighting and camera techniques to achieve intended effects.

- Objective 1
Apply lighting effects.
 - a. Use basic three point lighting for artistic effect: key, fill, rim
 - b. Use other realistic lighting: indoor, outdoor, mood, artistic, etc.
 - c. Understand & use 3D specific lighting sources: Global/Image Based, Directional, Spot Lights, Shadows/Shading, Point Light

Students should know what a key light is.

Students should know what a fill light is.

Students should know what a back light is.

Students should know different types of light.

Students should know about software created environmental light.

Students should be able to create lights in a 3d software package.

Students should be able to adjust basic lighting controls.

Students should be able to create an environmental light set up.

Students should be able to adjust shadows.

- Key Light
- Main Light
- Fill Light
- Back Light
- Rim Light
- Directional Light
- Point Light
- Ambient Light
- Spot Light
- Raytrace

Basic Rendering  (Week 10, 1 Week) 

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 7
Students will render 3D models.

- Objective 1
Introduce and apply the mechanics of rendering.
 - a. Use Ray tracing
 - b. Adjust Shadows/Lighting
 - c. Output different File Types
 - d. Output appropriate Resolutions and Destinations
 - e. Use appropriate Naming Conventions

Students should know the rule of thirds.

Students should know balance.

Students should know simple design.

Students should be able to take a final picture.

- .JPEG
- .PNG
- .PSD
- .TIFF
- .IFF
- Raytrace
- Alpha Channel
- Resolution

UV Texturing  (Week 11, 2 Weeks) 

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 4
Students will apply surface materials to 3D models.

Students should be able to envision what a 3d object looks like flattened.

Students should know

Students should be able to automatically map and unfold a 3d object.

Students should be able to

- Aspect Ratio
- UV Map
- Lambert

Intermediate

Modeling

2 Weeks) 



(Week 13,

- Objective 1
Create, Apply and edit surface materials.
 - a. Add & edit Color
 - b. Add & edit Texture
 - c. Add & edit Procedurals
 - d. Change Luminosity
 - e. Use Transparency
 - f. Work with Reflective
 - g. Add & edit UV Mapping

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 2

Students will create a basic 3D model as an introduction to the 3D development process.

- Objective 1
Introduce basic 3D terminology and the 3D application interface.
 - a. Know 3D terminology
 - b. Identify parts of the 3D application interface
- Objective 2
Create a 3D model. (Include modeling, surface materials, camera, lighting, moving, scaling, and rendering)
 - a. Include modeling
 - b. Add surface materials
 - c. Set cameras and lighting
 - d. Move and scale the model
 - e. Render the model.
- Objective 3
Create an environment/background.
 - a. Create an environment for a 3D project
 - b. Create a background for a 3D project

Standard 3

Students will model 3D objects.

- Objective 1
Use and manipulate 3D graphics and Primitives.
 - a. Use 3D primitives
 - b. Manipulate 3D models and primitives.
- Objective 2
Create, use and manipulate shapes.
 - a. Create 3D shapes
 - b. Use 3D shapes
 - c. Manipulate 3D shapes
- Objective 3
Edit models.
 - a. Use Extrusion

where to put seems.

output 2d maps for 3d objects.

Phong

Students should know what makes a product appealing.

Student should be able to create designs on a 2d map.

Blinn

Node

Transparency

Incandescence

Students should know what the extrude tool does.

Students should be able to extrude faces, edges, and vertices.

Extrude

Edge Loop

Students should know how smoothing effects their scene.

Students should be able to smooth a polygon.

Divisions

Students should be able to add individual divisions to a polygon.

Smooth

Poly Count

Students should be able to combine objects.

- b. Use Boolean
- c. Use Beveling
- d. Use Lathe/Revolve
- e. Add and remove Grouping
- f. Understand Model Hierarchy (parent/child)
- g. Use Reshape/Convert
- h. Use Duplication/Mirroring
- i. Understand and use Pivot/Origin Points
- j. Make a surface from Curves (lofting/skinning)
- k. Subdivision a model
- l. Modify edges, faces, vertices
- m. Use a reference graphic/image/drawing (background)
- n. Edit an object after its been created (history)
- o. Use other software specific tools

Intermediate Lighting
 (Week 15, 1 Week) 

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 5

Students will apply lighting and camera techniques to achieve intended effects.

- Objective 1
Apply lighting effects.
 - a. Use basic three point lighting for artistic effect: key, fill, rim
 - b. Use other realistic lighting: indoor, outdoor, mood, artistic, etc.
 - c. Understand & use 3D specific lighting sources: Global/Image Based, Directional, Spot Lights, Shadows/Shading, Point Light

Students should know what a key light is.

Students should be able to create lights in a 3d software package.

Key Light

Students should know what a fill light is.

Students should be able to adjust advanced lighting controls.

Main Light

Fill Light

Students should know what a back light is.

Students should be able to create an environmental light set up.

Back Light

Rim Light

Students should know different types of light.

Students should be able to adjust shadows.

Directional Light

Students should know what different attributes of the lights do.

Point Light

Ambient Light

Spot Light

Raytrace

Bitmap Shadow

Intermediate Rendering
 (Week 16, 2 Weeks) 

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics Standard 5

Students will apply lighting and camera techniques to achieve intended effects.

- Objective 2
Apply camera effects.
 - a. Adjust Aspect Ratio/Film Back
 - b. Change setting and modifying camera views:

Students should know the rule of thirds.

Students should be able to render several images.

.JPEG

Students should know balance.

Students should be able to adjust cameras.

.PNG

.PSD

Students should know simple design.

Students should be able to adjust render settings.

.TIFF

Staging and Manipulating, Truck, Pan, Zoom, Dolly

Students should know scale.

.IFF

Standard 7
Students will render 3D models.

Students should know negative space.

Raytrace

- Objective 1
Introduce and apply the mechanics of rendering.
 - a. Use Ray tracing
 - b. Adjust Shadows/Lighting
 - c. Output different File Types
 - d. Output appropriate Resolutions and Destinations
 - e. Use appropriate Naming Conventions

Alpha Channel

Resolution

Aspect Ratio

Basic Key Frame

Animation  (Week 18, 2 Weeks) 

UT: CTE: Information Technology, UT: Grades 9-12, 3D Graphics
Standard 6
Students will animate 3D models. (Covered in 3D Animation)

Students should know 12 principles of animation.

Students should be able to key frame a 3d sphere.

Tween

- Objective 1
Students will animate 3D models. (Covered in 3D Animation)

Students should understand the purpose of squash and stretch.

Students should translate the ball across frames using tweens.

Interpolate

Arcs

Students should understand the purpose of arcs.

Students should rotate the ball across frames using tweens.

Squash

Stretch

Students should understand how timing effects flow.

Students should open the graph editor and manually edit frames.

Anticipation

Students should understand tweens and interpolation of frames.

Graph Editor

Breakdown

