Texas CTE

# 3-D Modeling and Animation

**Knowledge and skills.** 3DMA

**1 Creativity and innovation. The student demonstrates creative thinking, constructs knowledge, and develops innovative products and processes using technology. The student is expected to:** 3DMA.1

- A evaluate, edit, and create scripts for animations; 3DMA.1A
- B identify and apply color theories, including harmony rules, tints, shades, gradients, color mixing, new color creation, and the visual impacts of specific color combinations using a digital format; 3DMA.1B
- C apply texture, transparency, skinning, and contour along a 3-D object surface; 3DMA.1C
- D compare, contrast, and integrate the basic sound editing principles, including mixing and manipulating wave forms, audio tracks, and effects; 3DMA.1D
- E compare and contrast the rules of composition such as the rule of thirds or the golden section/rectangle with respect to harmony and balance; 3DMA.1E
- F evaluate the fundamental concepts of 3-D modeling and design such as composition, perspective, angles, lighting, repetition, proximity, white space, balance, and contrast; 3DMA.1F
- G analyze 3-D model objects to interpret the point of interest, the prominence of the subject, and visual parallels between the structures of natural and human-made environments; 3DMA.1G
- H distinguish among typefaces while recognizing and resolving conflicts that occur through the use of typography as a design element; 3DMA.1H
- I use perspective, including spot and directional light, backgrounds, ambience, shades and shadows, and hue and saturation; 3DMA.1I
- J use the basic principles of design such as proportion, balance, variety, emphasis, harmony, symmetry, and unity in type, color, size, line thickness, shape, and space; 3DMA.1J
- K edit files using appropriate digital editing tools and established design principles such as consistency, repetition, alignment, proximity, white space, image file size, color use, font size, type, and style; and 3DMA.1K
- L identify pictorial qualities in a design such as shape and form, space and depth, or pattern and texture to create visual unity and desired effects in designs. 3DMA.1L

**2 Communication and collaboration. The student uses digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning experience of others. The student is expected to:** 3DMA.2

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A use vocabulary as it relates to digital art, audio, and animation; 3DMA.2A

B demonstrate the use of technology to participate in self-directed and collaborative activities within the global community; 3DMA.2B

C participate in electronic communities; 3DMA.2C

D create technology specifications for tasks and rubrics for the evaluation of products; 3DMA.2D

E design and implement procedures to track trends, set timelines, and evaluate products; 3DMA.2E

F collaborate with peers in delineating technological tasks; 3DMA.2F

G publish and save information in a variety of ways, including print or digital formats; 3DMA.2G

H analyze and evaluate projects for design, content delivery, purpose, and audience; and 3DMA.2H

I critique original 3-D digital artwork, portfolios, and products with peers. 3DMA.2I

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**3 Research and information fluency. The student applies digital tools to gather, evaluate, and use information. The student is expected to:** 3DMA.3

A distinguish among and correctly apply process color (RGB and CYMK), spot color, and black or white; 3DMA.3A

B research the history of 3-D modeling and 3-D animation; 3DMA.3B

C research career choices in 3-D modeling and 3-D animation; 3DMA.3C

D use the Internet to retrieve information in an electronic format; 3DMA.3D

E demonstrate the appropriate use of 3-D objects, digital imaging, video integration, and sound retrieved from an electronic format; 3DMA.3E

F import sounds from a variety of sources; and 3DMA.3F

G create planning designs such as rough sketches, storyboards, and brainstorming materials. 3DMA.3G

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**4 Critical thinking, problem solving, and decision making. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:** 3DMA.4

A distinguish between and use the components of 3-D animation software programs such as cast, score, environment, the X-Y-Z coordinate system, and the animation manipulation interface; 3DMA.4A

B distinguish between and use the different 3-D modeling techniques such as box modeling, transformation, and polygon primitives using extrusion and rotation; 3DMA.4B

C distinguish between and use the different 3-D animation techniques such as path and rendering using dynamics and physics; 3DMA.4C

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D apply a variety of color schemes such as monochromatic, analogous, complementary, primary/secondary triads, cool/warm colors, and split complements to digital designs; 3DMA.4D

E use the basic concepts of color and design theory such as working with 3-D models and environments, characters, objects, and other cast members as needed for the animation; 3DMA.4E

F use the appropriate rendering techniques to create an animation; 3DMA.4F

G use a variety of lighting techniques such as shadow, shading, point, spot, directional, and ambient to create effects; and 3DMA.4G

H define the design attributes and requirements of a 3-D animation project. 3DMA.4H

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**5 Digital citizenship. The student understands human, cultural, and societal issues related to technology and practices legal and ethical behavior. The student is expected to:** 3DMA.5

A discuss copyright laws/issues and use of digital information such as attributing ideas and citing sources using established methods; 3DMA.5A

B define plagiarism and model respect of intellectual property; 3DMA.5B

C demonstrate proper digital etiquette and knowledge of acceptable use policies when using technology; and 3DMA.5C

D evaluate the validity and reliability of sources. 3DMA.5D

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**6 Technology operations and concepts. The student demonstrates a sound understanding of technology concepts, systems, and operations. The student is expected to:** 3DMA.6

A demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components; 3DMA.6A

B make decisions regarding the selection and use of software and Internet resources; 3DMA.6B

C make necessary adjustments regarding compatibility issues with digital file formats, importing and exporting data, and cross-platform compatibility; and 3DMA.6C

D read, use, and develop technical documentation. 3DMA.6D