



## Board/Authority Authorized Course Framework Template

<b>School District/Independent School Authority Name:</b> Okanagan Skaha	<b>School District 67</b>
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<b>School Name:</b> Summerland Secondary	<b>Principal's Name:</b> Alan Stel
<b>Superintendent Approval Date (for School Districts only):</b>	<b>Superintendent Signature (for School Districts only):</b>
<b>Board/Authority Approval Date:</b>	<b>Board/Authority Chair Signature:</b>
<b>Course Name:</b> 3D Computer Animation 10	<b>Grade Level of Course:</b> 10
<b>Number of Course Credits:</b> 4	<b>Number of Hours of Instruction:</b> 100-120

### Board/Authority Prerequisite(s):

### Special Training, Facilities or Equipment Required:

Working computer lab, Maya 64bit software, 64-bit Intel® or AMD® multi-core processor with SSE4.2 instruction set, 16 GB or more recommended, Maya certified graphics hardware.

### Course Synopsis:

This course introduces students to the basics of 3D computer animation. Students will learn to design and model 3D objects using polygonal geometry and create various surfaces through texture mapping. Students will also be introduced to the principles of digital lighting, camera actions, and 3D animation fundamentals.

## **Goals and Rationale:**

### Rationale:

This course is intended to introduce creatively driven and artistically inclined students to the discipline of 3D Computer Animation at an early age. This subject matter has traditionally been only available to students at a post-secondary level. Exposing students to basic concepts of 3D Computer animation at grade 10 will draw on their foundational art and creativity skills. It will also provide students with a brief survey level overview to the specialty fields that are encompassed in Computer Animation. It will also help students decide if they have the creativity, skills, motivation and desire to pursue a future career in this growing occupation.

### Goals:

Upon successful completion of this course, the student will be able to:

- Create, save and edit animations and projects.
- Plan workflow for 3D modeling objects based on polygonal objects
- Navigate in the workspace of an industry standard 3D modeling application
- Create basic geometric shapes in space with primitive polygons
- Model more complicated shapes using reference images
- Build basic objects and props with polygon modeling techniques
- Apply various methods to unwrap UV meshes.
- Animate a simple animation cycle.
- Apply timing and spacing between animation key frames.

### **Aboriginal Worldviews and Perspectives:**

- The ethics of cultural appropriation and plagiarism

### BIG IDEAS

Personal animation skills require the evaluation and refinement of skills

Tools and technologies can be adapted for specific purposes.

Growth as an **animator** is dependent on perseverance, reflection and resilience.

### Learning Standards

Curricular Competencies	Content
<p><i>Students are expected to do the following:</i></p> <p><u>Exploring and creating</u></p> <ul style="list-style-type: none"> <li>• Demonstrate the ability to use <b>industry standard</b> software applications</li> <li>• Explore a wide range of resource materials varying from traditional text material to online resources and media platforms</li> <li>• Demonstrate creative thinking by using ideas acquired through exploration</li> <li>• Develop skills and techniques used in <b>3D computer animation</b></li> <li>• Demonstrate an active and disciplined approach to challenging and complex learning situations</li> <li>• Apply knowledge and skills from past learning experiences</li> </ul> <p><u>Ideating</u></p> <ul style="list-style-type: none"> <li>• Take creative risks in generating ideas and fulfilling project requirements</li> <li>• Screen ideas for possible conflicts and limitations</li> <li>• Maintain an open mind to allow rough concepts to develop and evolve into a finished product</li> </ul> <p><u>Modeling and Animating</u></p> <ul style="list-style-type: none"> <li>• Identify appropriate tools, software, materials, and an awareness of the <b>animation workflow pipeline</b> to complete assigned tasks</li> <li>• Develop a project plan for student centered work when working individually or as a group to coordinate responsibilities and resources</li> </ul>	<p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none"> <li>• 3D animation terminology</li> <li>• <b>Orthographic vs. perspective views</b></li> <li>• Software, file management and organization</li> <li>• Basic <b>polygon modeling</b> techniques focusing on extruding <b>faces</b> and inserting <b>edge</b> loops</li> <li>• Material creation, <b>uv mapping</b> and <b>texture mapping</b></li> <li>• <b>Character rigging</b> and animating using <b>key frames</b> and <b>joints</b></li> <li>• Modeling for 3D printing: limitations and constraints</li> <li>• Types of <b>3D printing filaments</b></li> </ul>

### Sharing

- Sharing of knowledge and skills while working in a collaborative environment
- Critically evaluating work to look for continual improvements to designs and knowledge base

### Applied Technologies

- Informed awareness of existing, new and emerging, software and tools that assist in the in the creation process in 3D animation
- Analyze the role and impact of technology on culture and society
- Study the impact of **e-waste** and plastics on the environment

## Big Ideas – Elaborations

- **animator** - an artist that produces multiple images and gives them the illusion of movement by displaying them in rapid sequence

## Curricular Competencies – Elaborations

- **industry standard** - the generally accepted requirements followed by the members of an industry
- **animation workflow pipeline** - the path by which an animation goes from an idea to a finished product. These steps include: story boarding, concept design, modeling, texturing, rigging, animating, lighting, rendering and editing
- **3D computer animation**- the process of generating animated images with the use of 3D computer graphics and software
- **e-waste** – discarded electrical or electronic devices that are destined for resale, salvage, recycling, or disposal

## Content – Elaborations

- **orthographic view** – represents a three dimensional object using several two-dimensional views of the object
- **perspective view** - gives a three-dimensional feeling to an object as it is seen by the eye
- **polygon modeling** - a modeling technique for creating 3D surfaces using many flat sided polygonal faces connected together to create a 3D model
- **face** - an individual polygon is commonly called a face. Faces refers to two or more polygons
- **edge** - a basic component of a polygon. Edges connect vertices to create faces

## Content – Elaborations

- **UV mapping** - a method used to “wrap” a 2D image onto a 3D object
- **texture map** - an image that is applied and accurately positioned on 3D model to change/modify the appearance of the model
- **character rig** - a skeletal structure for a 3D model used to control its movement, deformation and bending
- **joints** - the building blocks for the skeletal structure of the character rig. Joints allow for points of movement and articulation within the skeletal structure
- **key frame** - defines the starting and end points of an animation
- **3D printing filament** – a plastic stranded wire used in 3D printing as a consumable material to make physical 3D models and prototypes

### Recommended Instructional Components:

- Direct instruction
- Demonstrations
- Tutorial support material
- Peer teaching
- Experimental learning and problem solving

### Recommended Assessment Components: Ensure alignment with the [Principles of Quality Assessment](#)

- Performance assessment
- Self-assessment

**Learning Resources:**

Lynda.com

[area.autodesk.com/all/tutorials/maya](http://area.autodesk.com/all/tutorials/maya)

[academy.autodesk.com/curriculum/animation](http://academy.autodesk.com/curriculum/animation)

**Additional Information:**

None