**Unit Topic:** Introduction to Revit **Date: 4/20/2020**

**Lesson topic:** BIM (Building Information Modeling) Modeling **Instructor: Mr. Ronaldo**

**Standards to be Addressed (Learning Standards):**

* *Common Core State Standards: ELA- Speaking & Listening SL.11-12.1.b*

*Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadline, and establish individual roles as needed*

* *Common Core State Standards: ELA Writing 11-12. WHST.2.c*

Used varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts

* *Career Development and Occupation Studies,2: Integrated Learning*

 Students will demonstrate how academic knowledge and skills are applied in the workplace and

 other settings

* *International Standards for Students, 4b: Innovative Designer*

Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks

* *International Standards for Students, 4d: Innovative Designer*

Students exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.

**Motivation:** If you have the power to design your own house, How would it look like? What qualities would you want your house to have? Sketch it

*Explanation*: Revit will be the answer. As we have seen in the previous lesson, AutoCAD can teach us to design site plans for different structures, but what about if we want to design our own structure? Draw it, but you know this does not look like realistic or professional. To help this more realistic, we can use Revit. This part of the course will allow you to gain an understanding of BIM Modeling and its benefits via Revit Architecture. Revit is a building information modelling software for architects, structural engineers, mechanical and others.

\*\*The answer is for me as a reminder when explaining this to the entire class.

**Aim:** How do we design a Building Structure via Revit?

**Instructional Objectives**

At the end of this lesson, students will be able to

* Recall the two approaches used for Construction Drafting
* Identify the importance of Revit in Engineering/Architecture Drafting
* Demonstrate different techniques that will enable student to design their own building or structure
* Identify the different features that goes into building a 3D Building or Structure

\*\*It is important to note I will not be covering the entire lesson plan in 45 minutes. This lesson plan is intended as an overview for a long period of time (4 to 6 weeks approximately) and each objective will be shown as time follows

**Materials:**

The content of the class will be displayed by using the Smartboard so students can see the process while in class. PowerPoint slides will also be made available to students via Google classroom

* Computer, Smartboard, Projector, PowerPoint, notebook, pen, pencils

**Presentation:**

The learning process will be done using the smartboard by showing through the main computer (in this case the teacher which is me). In addition, the main use of technology will be instructional videos I will be showing with additional videos collected from other sources such as Autodesk website and the Comprehensive Guide for Revit Architecture. The best way for teaching this type of technology is by doing and students will be watching me designing different sketch via Revit on the blackboard or through their screens (I will post videos of me designing different structures so they can go back whenever they wish).

1. **Introduction to BIM**

**Step 1**: Open Revit

**Step 2:** Click New

**Step 3:** Choose Architectural Template

1. **Revit: Walls**

**Step 1:** Click Wall

**Step 2:** Choose Desired under Properties Table on the left side

**Step 3:** Draw your tables by dragging the mouse

1. **Revit: Massing & Site**

**Step 1:** Click on Massing & Site

**Step 2:** Choose Toposurface

**Step 3:** Make sure you are on Place Point

**Step 4:** Choose the different points as reference for your desired site

**Step 5:** Click the green check

1. **Revit: Doors & Windows**

**Step 1:** Make sure you are on Level 1 under Floor Plans which is located under Project

Browser

**Step 2:** Click on Doors / Windows under Architecture

**Step 3:** Under Properties, Choose the desired Door/Window you want to add to your

structure

**Step 4:** Place the Door/Window in the wall

1. **Revit: Components & Families**

**Step 1:** If your favorite Door/Windows are not listed under Properties, you can go to

Structure tab on the top and click on Components

**Step 2:** Once on Components, click on Load Family and make sure you are in US

Imperial

**Step 3:** Inside here, you can choose a variety of windows, doors, furniture, columns,

lighting, etc.

**Step 4:** Choose the desired component you want into your draft

**Step 5:** Add the new component into your project

1. **Revit: Roof**

**Step 1:** Click on Roof under Architecture tab

**Step 2:** Make sure you are on Level 2 under Floor Plans

**Step 3:** Draw your roof by using lines or pick the lines from the wall

**Step 4:** Click the Green Check once you are done

**Step 5:** You can choose the material type for your Basic Roof

1. **Revit: Floors**

**Step 1:** Click on Floor under Architecture Tab

**Step 2:** Make sure you are on Level 1 under Floor Plans

**Step 3:** Sketch your floor by using lines based on your building boundaries

**Step 4:** Click the Green Check when you complete sketching your floor plan

**Step 5:** As stated, you are able to choose the material type for your floor under properties

table

1. **Revit: Stairs and Railings**

**Step 1:** Click on Stairs tab on the top of the screen

**Step 2:** Draw the stair as you desired, keep in my the Railing are included within the

drawing

**Step 3:** Once completed, check the green check

1. **Revit: Rooms and Areas**

**Step 1:** Click on Area

**Step 2:** Choose Area Plan and click Gross Building

**Step 3:** Make sure you Click Yes

**Step 4:** Your area should be displayed there

**Step 5:** For Room, Click on Room on the top part

**Step 6:** Under Properties, make sure you change it from Room Tag to Room Tag with

Area

**Step 7:** Select all the rooms you designed in your project

1. **Revit: Annotations, Dimensions and Detailing**

**Step 1:** Click on Annotations Tab

**Step 2:** Choose Aligned tab

**Step 3:** In your project, decide which part you want to get its length by selecting them. If

you are not able to select a specific corner, just press tab on your keyboard and

this might help

**Step 4:** For detailing, click on View and select Callout

**Step 5:** Select which specific section you want to click

**Step 6:** After you have completed this, you will see a new level has been created with

Callout 1 right next to it, click here

**Step 7:** You will see the part you chose previously but more detailed

1. **Revit: Views**

**Step 1:** Go to the top and look for a house design tab or Click View

**Step 2:** In this button, you can click “Default 3D View” and you will see the exterior side

of your project

**Step 3:** If you press “Camera” underneath, a small camera will show on the screen and

you can choose where to place it so you could see the specific details on the

specific chosen location (Mostly commonly for Interior Views)

1. **Final Project**
	* 1. Students will be tasked to design their own structure under specific guidelines learned from the period of time

\*\*\*Students will be tested after each presentation by designing their own structure and submitting to the teacher in a daily/weekly basis. For daily assignment, students will be asked to research different ways to design other than one I showed so they think outside the box. Also, they are expected to write reports about the work they do with the structure designed and this will be used as a way for me to verify their knowledge in the content. Moreover, they will have a do now and exit ticket, so I check they are learning consistently the content of the class. From there, students will receive feedback to continue with the next step of the class.

**Summary**

1. Recognize the importance of each step of Revit
2. What is the purpose of this program in the Architecture/Engineering Field?
3. Show each student how they can develop their own structures by applying different techniques and creativity

**Immediate Application**

Students will be tested after each presentation by designing their own structure and submitting to the teacher in a daily/weekly basis. For daily assignment, students will be asked to research different ways to design other than one I showed so they think outside the box. They will have a do now and exit ticket so I can make sure they are learning the content of the class. From there, students will receive feedback to continue with the next step from the presentation. Students will also be asked to work in groups and design a building as a potential solution for a local community, so they are able to understand and visualize the bigger picture of the class.

Moreover, after each presentation, each student will design their own part from the recent content they just learned so they can familiarize with the different tools to complete their final project

**Homework**

Ask students to choose what structure they would like to design and ask them to do it in their own way and ask them how the process went and the different challenge along the way. From this assignment, students will be retaining more knowledge about the process to design a structure and familiarize with the different tools in Revit. Students will also do lab reports (individually and in group) so they start building new skills such as communication and teamwork

**Reference**

Revit Architecture 2015: A comprehensive Guide (Pearson) Goldbert, H.E