

KEY IN-CLASS STUDENT ACTIVITY 3.3: DRAW OBJECTS

Lesson Objective 3.3:

Draw objects. *Topic:* 3D graphics.

Resources, software, and additional files needed for this lesson:

1. Microsoft Visual Studio 2010® and XNA® 4.0
2. Internet access
3. Tutorial 1: Displaying a 3D Model on the Screen: <http://msdn.microsoft.com/en-us/library/bb203896.aspx>

Guiding questions:

1. **How do you add 2-D and 3-D graphics to the screen with XNA?** 2-D graphics are added to the screen by first adding the content resource to your solution. The graphics must be loaded in the LoadContent() method, and finally, the graphics must be drawn to the screen in the Draw() method. 3-D graphics are added to the content of your solution by using the variable model.
2. **What are the three different types of shaders and what are their functions?**
A Vertex shader manipulates the vertex based on mathematical functions.
A Geometry shader is used to add new vertices based on what is there or on the current design.
A Pixel/Fragment shader manipulates the color of the pixels. The main difference between the Vertex shader and the Pixel/Fragment shader is that the vertex shader is based on the geometry of the image and the Pixel/Fragment shader is used to change the color of the pixels.
3. **What is parallax mapping?** Enhanced mapping techniques that are used to make images seem more real and have more depth.

Student Activity:

Directions to the student:

1. Read the following scenario. Complete the tutorial "Tutorial 1: Displaying a 3D Model on the Screen."
2. Show your instructor the completed project when finished. Respond to the questions.

Scenario:

Trey Research is entering the education game market. They are planning a 3-D game in which the user flies a plane around the world to find the answers to geography problems. For example, the user might be asked to name the capital of a country and then have to navigate to the country to locate the city. Iliana Simbaeva has been offered the position of manager for this project and is eager to show her expertise with using 3-D graphics in XNA. She is going to practice her skills with a MSDN® Library tutorial.

Tutorial 1: Displaying a 3D Model on the Screen

[http://msdn.microsoft.com/en-us/library/bb197293\(v=XNAGameStudio.31\).aspx](http://msdn.microsoft.com/en-us/library/bb197293(v=XNAGameStudio.31).aspx)

Content:

1. What variable do you use to create a 3-D graphic?

model

2. Explain in your own words how to add the model to the solution and draw the model to the screen.

3-D graphics are added to the solution by using the variable model. Right-click your content project in the Solution Explorer and click Add, Existing Item. Then browse and choose the files to use. Next, declare a model variable for each 3-D graphic that you wish to add. Example: model plane. In the Draw method, draw the model on the screen with texture and lighting. In the Update() method, make the model change its orientation based on time so that it appears to rotate.

3. In which method would you put the code to move the plane? Why?

The *Update()* method would be used because movement would need to be updated 60 times per second.