Task 01

Three-dimensional graphics such as that of the buildings in CS:GO, seems to mimic real life objects. But if investigated closely, the elements are flat, clearly not like the buildings we have. However, the textures and shadows seem to play a role in tricking the viewer to think that it closely resembles real life objects.

Task 02

Certain shape such as triangles or polygons, when repeated and arranged in a certain manner, could create a 3D effect on the shape. The higher the repetition is, or in the case of the example— the stack count and subdivision, the higher is the quality of the 3D shape since the sharp edges of shapes can be smoothened out to a certain degree by stacking a shape on it—until finally coming to a point where it wouldn't seem "*sharp"* on certain perspectives.

Task 03

It can be observed from the example that the shape of the teapot seems to look like a real teapot, but on a different perspective, we could see sharp edges that are not present in a real teapot. Graphics quality is influenced by the number of shapes stacked. The more shapes are used, the higher is the rendered quality.

Task 04

Adding more triangles significantly reduce the frame rate.

Task 05

Theoretically, moving vertices simultaneously in parallel threads would improve the frame rate since GPU is good at executing the same instruction in parallel compared to doing one thing at a time.

Reflection

A 3D object is a transformed 2D object composed of triangles. It creates an illusion using transformations, textures, camera angling, and light. To achieve a higher graphics quality, the number of triangles of an object should be increased.

In AAA titles, you usually need a more powerful GPU to achieve a higher graphics quality since rendering high quality objects creates more job for the GPU to support many pixels in each frame. Lowering the graphics' quality means decrease in the number of triangles, therefore improving the FPS**.**