

Concept:

The concepts I learned in illumination were fascinating. Starting with direct and indirect illumination. I thought it was good to know one another, for future games. Because you could need only direct lighting in a certain area or only indirect lighting in a certain area. Maybe you need the combination of both all the time, which gives the total illumination of our real life lighting. It was also helpful understanding different ways light can be used or what it can be (spotlight, directional, and point lighting).

Next concept I enjoyed the most was lighting vs shading. It was interesting to see the different models used to get realistic lighting or more playful lighting on shaders. Phong obviously was the best one in terms of realistic. However, maybe a game I am working on doesn't need phong's realistic shading/lighting. It's extremely helpful to understand how different techniques can make you achieve anything you want in lighting/shading.

Experience:

My experience in programming lighting in our assignment was interesting to say the least, in a good way. I thought I was doing something wrong, when creating the reflection.

```
vec3 reflection = normalize(2.0 * dot(worldNormalNormalized, uLightDirection) * worldNormalNormalized - uLightDirection);
```

But no, the reflection really was that simple considering we solved/created the needed vectors. Obviously we didn't use some other variables for the reflection equation, but the concept of implementing it was fairly straightforward.

The most exciting part of this assignment was combining everything we have learned in previous weeks. We quite literally combined everything into this assignment. Starting with WebGL, matrices/vector math, and illumination. It was mind boggling to see everything coming together into a single scene. While programming this assignment, I was already getting the idea on how to start/create our final project.