Presentation (part 2): Technical aspects of use of lighting in Second Life

***Presenter**: The following slides offer examples how lighting can be controlled in Second Life. The point here is not to focus on the details of the software, but to provide an overview of the capabilities of such a system. This slide shows the complete set of graphics preferences. The ones indicated by the red boxes are those most useful for controlling the rendering of lighting. This includes the sun, moon and any lights that you place in the scene, as well as the shadows cast by them.*

To experiment with the effects of lighting, it can be useful to create a lighting chamber. Here we show the virtual equivalent of a physical 'light box' that might be used by lighting designers. An additional advantage of the virtual world version is that you can place yourself in it and experience the space from the user's viewpoint. Note the different types of lights in the lighting chamber. The purple one the left is omni-directional, meaning that the light is cast in all directions. The others are directional lights (such as a spotlight). One of them acts as a projector, casting an image from the light source onto the ground.

This slide shows the parameters you can adjust when designing lights. To create a light source, you activate the 'light' feature in a Second Life geometric object (which is called a 'prim'). The advanced lighting options—such as dynamic shadows and directional lights—require more powerful graphics processing power. Without advanced lighting, you are limited to creating omnidirectional lights, specifying light colour, intensity (or brightness), the radius of throw, and falloff (which indicates the amount the light intensity decreases as the distance from the light source increases). The ones indicated by the bold red box on the right are additional parameters for directional lights.

One thing to note about the light feature settings is that they apply to the light that is being cast, meaning that we see the effect of the light only upon surfaces that it illuminates. To represent other aspects of lighting that we normally see requires some tricks.

If we look at the green light from the lighting chamber again, we see a beam projected to the ceiling. This occurs in reality because we see particles in the air being illuminated. In Second Life, the beam from a light source is not visible, so a transparent, glowing cylinder was created as part of the lighting object to simulate this phenomenon. Similarly, the glow from a light source (here, at the base) can also be simulated. The dialogue settings shown here provide a means of faking some of these aspects of a light through the texture on the surface of an object, including colour, transparency and glow. The lighting object here consists of two prims, the first, modelling the light source and its glow, the second, the light beam.

In Second Life it is possible to set the position of the sun in the sky, to approximate the time of day and how shadows are cast. Traditional 3D modelling systems usually have the ability to set a location on earth as well as a given time and date of the year, in order to obtain an exact sun position and shadow casting. As we are here in a virtual world, we don't have such precise control; thus, sun movements and positions

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can approximate real world conditions, but are unlikely to duplicate them. It should also be noted that in Second Life the illumination provided by the sun is not accurate and interiors may appear over-illuminated. It is therefore a good idea to set the sun to midnight when testing lighting design.

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