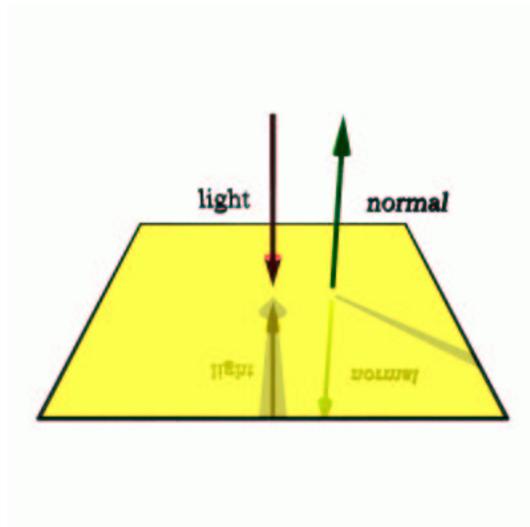Both the dot and cross product are used when rendering three-dimensional objects on the computer. The angle at which rays from the light source hit the surface determines how to shade that piece of the surface.

If a light ray hits the surface straight on, that is if it has a zero angle with the normal, then this piece of the surface will appear bright.

The piece of surface will appear dimmer, if the angle between the normal of the surface and the light ray is closer to a 90 degree angle.
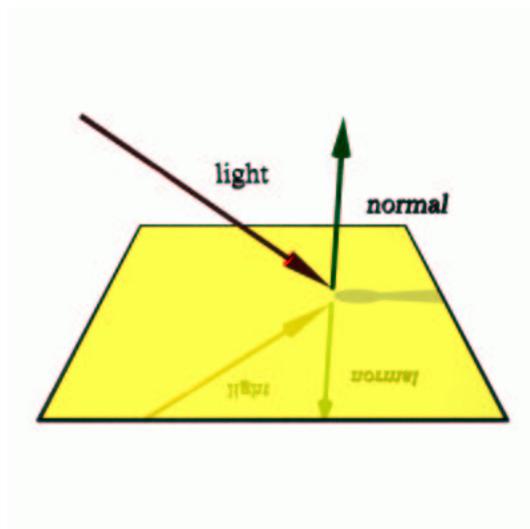
Suppose we have a light source directly above the xy-plane and that the light rays come in parallel to the vector $(0, 0, 1)$.

- At what angle to the normal do the light rays hit a triangle bounded by the points $(3, 2, 4), (2, 5, 3)$ and $(1, 2, 6)$?

- At what angle to the normal do the light rays hit a triangle bounded by the points $(3, 5, 2), (3, 3, 1)$ and $(1, 3, 1)$?

- Suppose we are standing above the light source looking down on the xy-plane. Which of these two regions will appear brighter to us?

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[1]From study Guide by Robert Burton and Dennis Garity