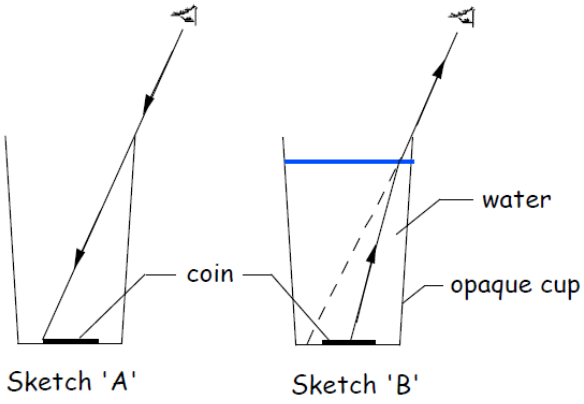
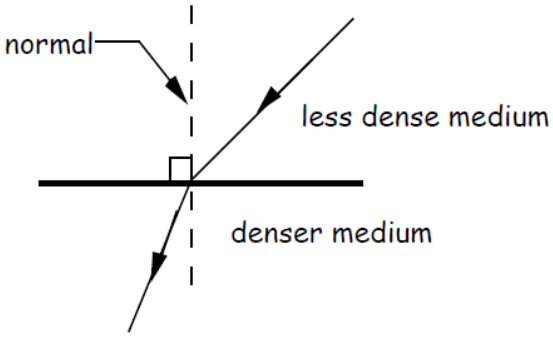
Answer on Question #52058-Physics-Optics

Two opaque cups have a coin in the bottom of each. One is filled with water and the other is empty. When the two cups, side by side are viewed from an angle so that you can see half of the coin in the water cup, the coin in air is not visible. Explain this.

Answer





Sketch 'C'

The eyes were positioned, such that the light rays coming from the coin were blocked by the rim of the cup. By adding water to the cup, these same light rays from the coin are now refracted away from the normal, as it travels from denser to a less dense medium (see Sketch B & C).

The normal is the line perpendicular to the surface separating the two media through which the light ray travels. Other liquids with high refractive indices, usually the denser ones, may replace water in this case. This phenomenon is the reason why some deep waters seem to look shallow.