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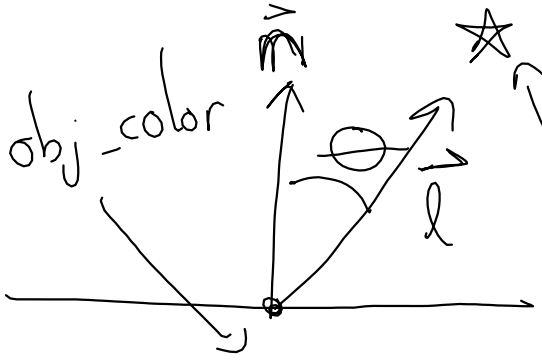
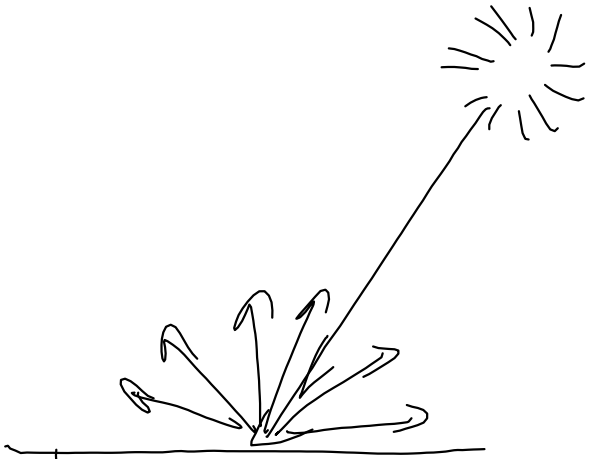
Lighting

Diffuse color





$\cos\theta$

diff_color =
light_color * obj_color * $\cos\theta$

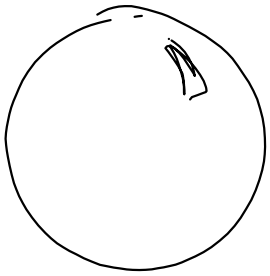
$$\cos\theta = \frac{\vec{n} \cdot \vec{l}}{\|\vec{n}\| \|\vec{l}\|}$$

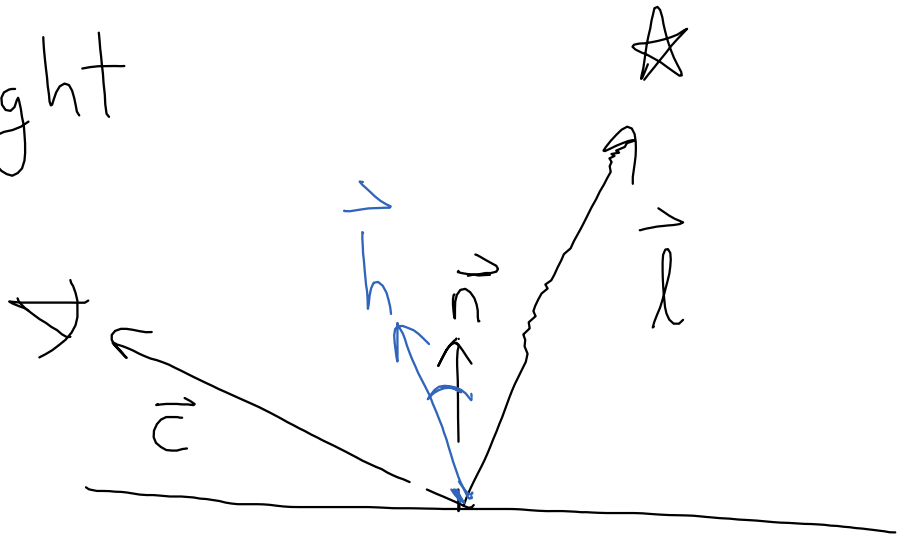
Ambient color

amb_color = light_color * obj_color

color = diff_color + amb_color

Specular light





half-way $\vec{h} = \dfrac{\vec{c} + \vec{l}}{\|\vec{c} + \vec{l}\|}$

$\cos\theta = \dfrac{\vec{h} \cdot \vec{n}}{\|\vec{h}\| \|\vec{n}\|}$ $\quad \|\vec{h}\| = 1$

$(\vec{h} \cdot \vec{n})^s$ "shininess"

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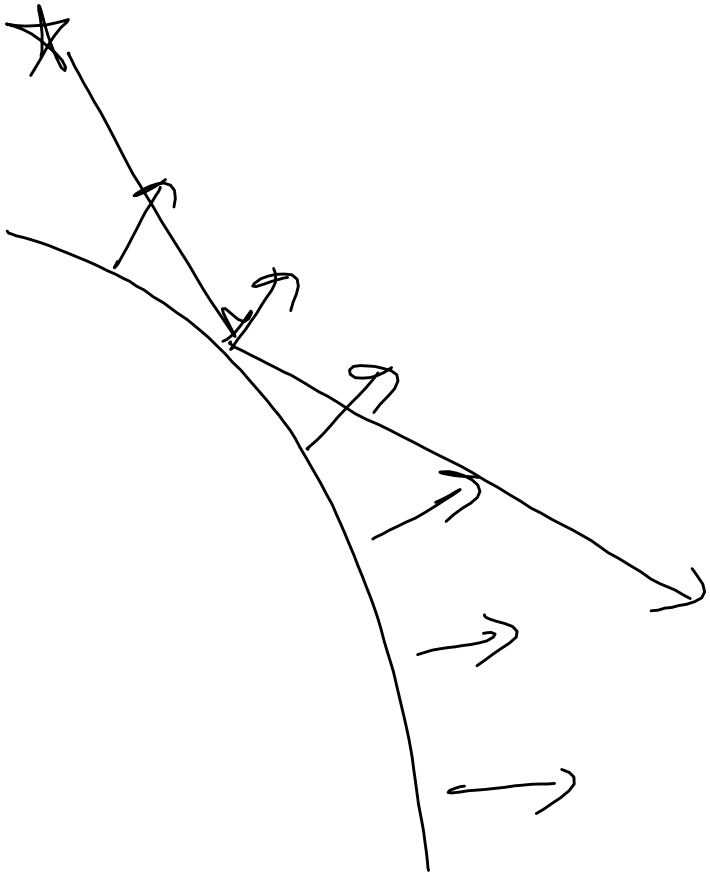

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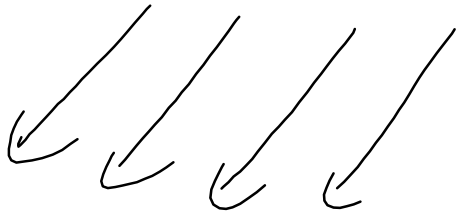
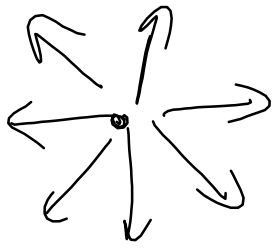
Light sources

Directional



Point



Multiple Lights =
sum of all sources

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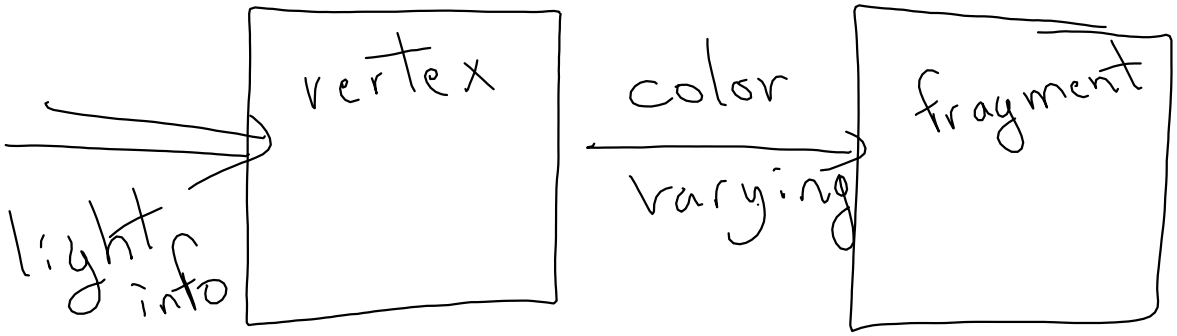
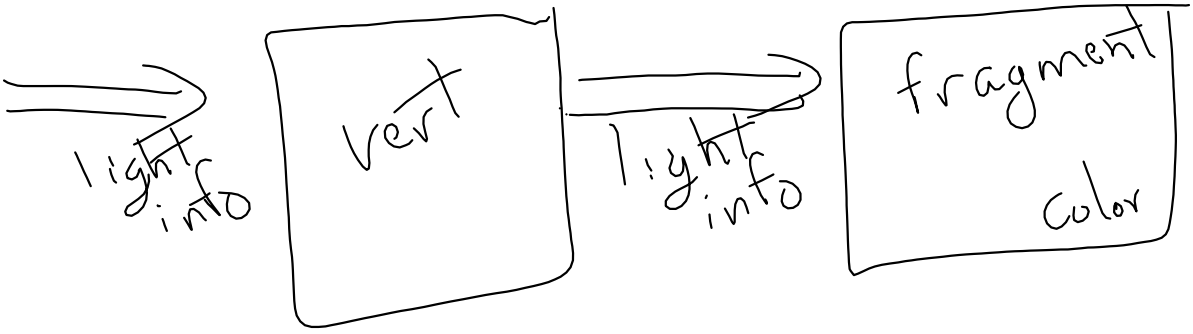
WebGL

per-vertex





Light info

uniform
- Light color
- Dir/Point
- Light dir/pos
- Ambient color

attrib / varying
- normal
- position
- color

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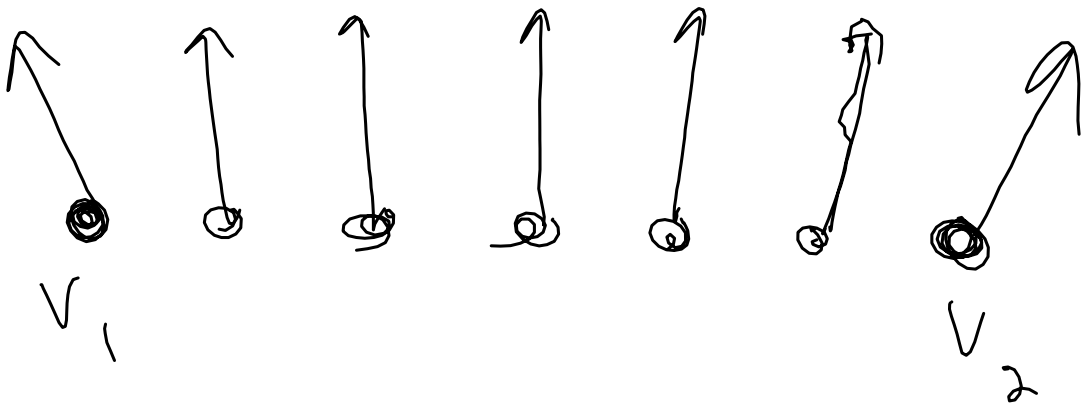

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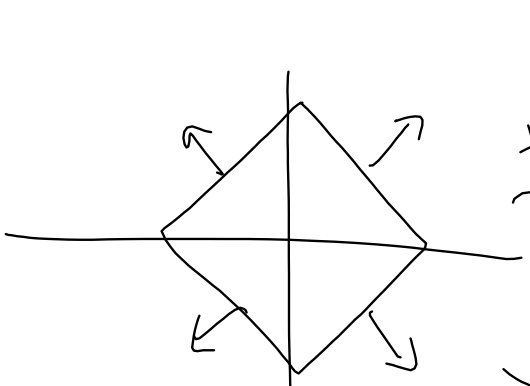
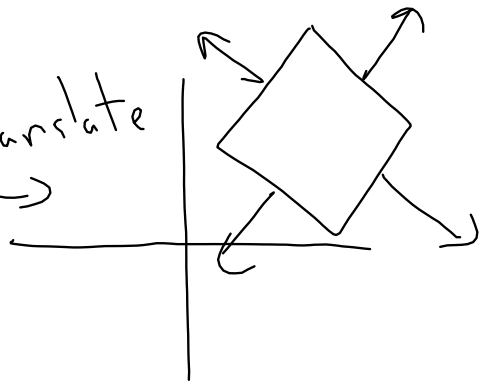
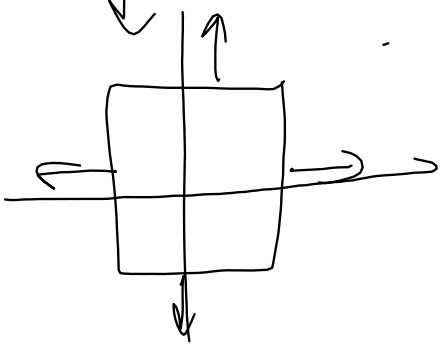
Transform normals



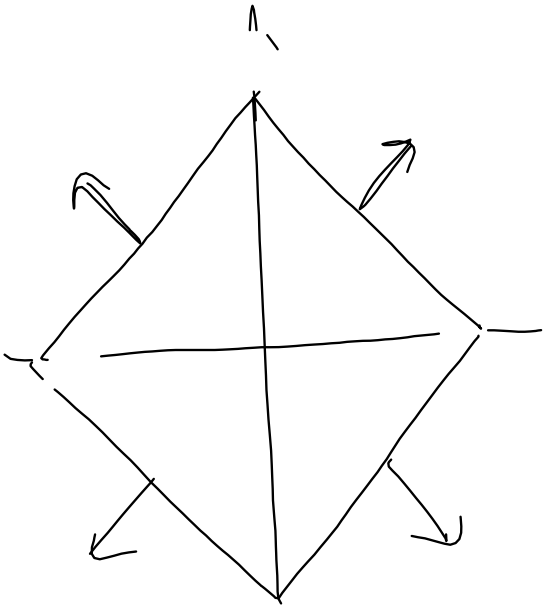
translate



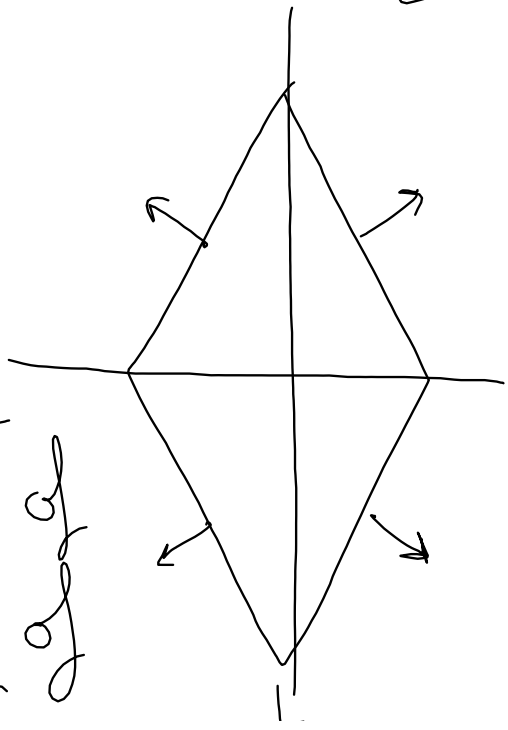
rotate



scale



non-uniform scaling



use transpose of the inverse of

the transform matrix