Manuel Larios
CS360

CAMERA

```
SCENE ⟹ SCENE_ITEM...
SCENE_ITEM ⟹ CAMERA
CAMERA ⟹ camera { [CAMERA_TYPE] [CAMERA_ITEMS] [CAMERA_MODIFIERS] }
[CAMERA_TYPE] ⟹ camera { perspective [CAMERA_ITEMS] [CAMERA_MODIFIERS] }
[CAMERA_ITEMS] ⟹ camera { perspective [location VECTOR] [CAMERA_MODIFIERS] }
VECTOR ⟹ camera { perspective [location VECTOR_TERM] [CAMERA_MODIFIERS] }
VECTOR_TERM ⟹ camera { perspective [location VECTOR_EXPRESSION] [CAMERA_MODIFIERS] }
VECTOR_EXPRESSION ⟹ camera { perspective [location VECTOR_LITERAL] [CAMERA_MODIFIERS] }
VECTOR_LITERAL ⟹ camera { perspective [location <FLOAT, FLOAT, FLOAT>] [CAMERA_MODIFIERS]
}
<FLOAT, FLOAT, FLOAT> ⟹ camera { perspective location <10, 0, 0> [CAMERA_MODIFIERS] }
CAMERA_MODIFIERS ⟹ camera { perspective location <10, 0, 0> [look_at VECTOR] }
VECTOR ⟹ camera { perspective location <10, 0, 0> [look_at VECTOR_TERM] }
VECTOR_TERM ⟹ camera { perspective location <10, 0, 0> [look_at VECTOR_EXPRESSION] }
VECTOR_EXPRESSION ⟹ camera { perspective location <10, 0, 0> [look_at VECTOR_LITERAL] }
VECTOR_LITERAL ⟹ camera { perspective location <10, 0, 0> [look_at <FLOAT, FLOAT, FLOAT>]
}
<FLOAT, FLOAT, FLOAT> ⟹ camera { perspective location <10, 0, 0> look_at <0, 0, 0> }
```

LIGHT SOURCE

```
SCENE ⟹ SCENE_ITEM…
SCENE_ITEM ⟹ LIGHT
LIGHT ⟹ LIGHT_SOURCE
LIGHT_SOURCE ⟹ light_source { V_LOCATION, COLOR }
V_LOCATION ⟹ light_source { VECTOR, COLOR }
VECTOR ⟹ light_source { VECTOR_TERM, COLOR }
VECTOR_TERM ⟹ light_source { VECTOR_EXPRESSION, COLOR }
```

```
VECTOR_EXPRESSION ⟹ light_source { VECTOR_LITERAL, COLOR }
VECTOR_LITERAL ⟹ light_source { <FLOAT, FLOAT, FLOAT>, COLOR }
<FLOAT, FLOAT, FLOAT> ⟹ light_source { <10, 10, -10>, COLOR }
COLOR ⟹ light_source { <10, 10, -10>, color COLOR_BODY }
COLOR_BODY ⟹ light_source { <10, 10, -10>, color COLOR_VECTOR }
COLOR_VECTOR ⟹ light_source { <10, 10, -10>, color rgb 3D_VECTOR }
3D_VECTOR ⟹ light_source { <10, 10, -10>, color rgb VECTOR }
VECTOR ⟹ light_source { <10, 10, -10>, color rgb VECTOR_TERM }
VECTOR_TERM ⟹ light_source { <10, 10, -10>, color rgb VECTOR_EXPRESSION }
VECTOR_EXPRESSION ⟹ light_source { <10, 10, -10>, color rgb VECTOR_LITERAL }
VECTOR_LITERAL ⟹ light_source { <10, 10, -10>, color rgb <FLOAT, FLOAT, FLOAT> }
<FLOAT, FLOAT, FLOAT> ⟹ light_source { <10, 10, -10>, color rgb <255, 255, 0> }
```

CYLINDER

```
SCENE ⟹ SCENE_ITEM…
SCENE_ITEM ⟹ OBJECT
OBJECT ⟹ FINITE_SOLID_OBJECT
FINITE_SOLID_OBJECT ⟹ CYLINDER
CYLINDER ⟹ cylinder { V_BASE_CENTER, V_CAP_CENTER, F_RADIUS [OBJECT_MODIFIERS] }
V_BASE_CENTER ⟹ cylinder { VECTOR, V_CAP_CENTER, F_RADIUS [OBJECT_MODIFIERS] }
VECTOR ⟹ cylinder { VECTOR_TERM, V_CAP_CENTER, F_RADIUS [OBJECT_MODIFIERS] }
VECTOR_TERM ⟹ cylinder { VECTOR_EXPRESSION, V_CAP_CENTER, F_RADIUS [OBJECT_MODIFIERS] }
VECTOR_EXPRESSION ⟹ cylinder { VECTOR_LITERAL, V_CAP_CENTER, F_RADIUS [OBJECT_MODIFIERS]
}
VECTOR_LITERAL ⟹ cylinder { <FLOAT, FLOAT, FLOAT>, V_CAP_CENTER, F_RADIUS
[OBJECT_MODIFIERS] }
<FLOAT, FLOAT, FLOAT> ⟹ cylinder { <0, 0, 0>, V_CAP_CENTER, F_RADIUS [OBJECT_MODIFIERS] }
V_CAP_CENTER ⟹ cylinder { <0, 0, 0>, VECTOR, F_RADIUS [OBJECT_MODIFIERS] }
VECTOR ⟹ cylinder { <0, 0, 0>, VECTOR_TERM, F_RADIUS [OBJECT_MODIFIERS] }
VECTOR_TERM ⟹ cylinder { <0, 0, 0>, VECTOR_EXPRESSION, F_RADIUS [OBJECT_MODIFIERS] }
```

VECTOR_EXPRESSION ⟹ cylinder { <0, 0, 0>, VECTOR_LITERAL, F_RADIUS [OBJECT_MODIFIERS] }
VECTOR_LITERAL ⟹ cylinder { <0, 0, 0>, <FLOAT, FLOAT, FLOAT>, F_RADIUS [OBJECT_MODIFIERS] }
<FLOAT, FLOAT, FLOAT> ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, F_RADIUS [OBJECT_MODIFIERS] }
F_RADIUS ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, FLOAT [OBJECT_MODIFIERS] }
FLOAT ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, NUMERIC_TERM [OBJECT_MODIFIERS] }
NUMERIC_TERM ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, NUMERIC_FACTOR [OBJECT_MODIFIERS] }
OBJECT_MODIFIERS ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 [OBJECT_MODIFIERS] }
NUMERIC_TERM ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 [OBJECT_MODIFIERS] }
OBJECT_MODIFIERS ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 [PIGMENT] & [FINISH] }
PIGMENT ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {PIGMENT_BODY} & [FINISH] }
PIGMENT_BODY ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {PIGMENT_TYPE} & [FINISH] }
PIGMENT_TYPE ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {COLOR} & [FINISH] }
COLOR ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {color COLOR_BODY} & [FINISH] }
COLOR_BODY ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {color COLOR_IDENTIFIER} & [FINISH] }
COLOR_IDENTIFIER ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {color Cyan} & [FINISH] }
FINISH ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {color Cyan} finish { [FINISH_ITEMS] } }
FINISH_ITEMS ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {color Cyan} finish { ambient COLOR } }
COLOR ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {color Cyan} finish { ambient COLOR_BODY } }
COLOR_BODY ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {color Cyan} finish { ambient COLOR_IDENTIFIER } }
COLOR_IDENTIFIER ⟹ cylinder { <0, 0, 0>, <0, 4, 0>, 0.75 pigment {color Cyan} finish { ambient Blue } }

PLANE

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```
SCENE ⟹ SCENE_ITEM…
SCENE_ITEM ⟹ OBJECT
OBJECT ⟹ INFINITE_SOLID_OBJECT
INFINITE_SOLID_OBJECT ⟹ PLANE
PLANE ⟹ plane { V_NORMAL, F_DISTANCE [OBJECT_MODIFIERS] }
V_NORMAL ⟹ plane { VECTOR, F_DISTANCE [OBJECT_MODIFIERS] }
VECTOR ⟹ plane { VECTOR_TERM, F_DISTANCE [OBJECT_MODIFIERS] }
VECTOR_TERM ⟹ plane { VECTOR_EXPRESSION, F_DISTANCE [OBJECT_MODIFIERS] }
VECTOR_EXPRESSION ⟹ plane { VECTOR_LITERAL, F_DISTANCE [OBJECT_MODIFIERS] }
VECTOR_LITERAL ⟹ plane { <FLOAT, FLOAT, FLOAT>, F_DISTANCE [OBJECT_MODIFIERS] }
<FLOAT, FLOAT, FLOAT> ⟹ plane { <0, -1, 0>, F_DISTANCE [OBJECT_MODIFIERS] }
F_DISTANCE ⟹ plane { <0, -1, 0>, FLOAT [OBJECT_MODIFIERS] }
FLOAT ⟹ plane { <0, -1, 0>, NUMERIC_TERM [OBJECT_MODIFIERS] }
NUMERIC_TERM ⟹ plane { <0, -1, 0>, NUMERIC_FACTOR [OBJECT_MODIFIERS] }
NUMERIC_FACTOR ⟹ plane { <0, -1, 0>, 50.0 [OBJECT_MODIFIERS] }
OBJECT_MODIFIERS ⟹ plane { <0, -1, 0>, 50.0 [PIGMENT] }
PIGMENT ⟹ plane { <0, -1, 0>, 50.0 pigment {PIGMENT_BODY} }
PIGMENT_BODY ⟹ plane { <0, -1, 0>, 50.0 pigment {PIGMENT_TYPE} }
PIGMENT_TYPE ⟹ plane { <0, -1, 0>, 50.0 pigment {color COLOR} }
COLOR ⟹ plane { <0, -1, 0>, 50.0 pigment {color COLOR_BODY} }
COLOR_BODY ⟹ plane { <0, -1, 0>, 50.0 pigment {color COLOR_IDENTIFIER} }
COLOR_IDENTIFIER ⟹ plane { <0, -1, 0>, 50.0 pigment {color Green} }
```