How to Present Liquid in the Glass

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In this tutorial, it is not going to show how to make a glass but it will focus on how to present some kind of liquid in a glass.

Here we are going to make a glass of cranberry juice as the example.
Main Idea ...

The main idea to present the liquid in a glass is to fill the glass by using that “glass shape” of liquid instead of that inside “glass shape” of air.
Two Main Things we need to consider for the air and different kinds of liquids besides specularity, diffuse, transparency, translucency, etc.: 

- **Color**

- **Refraction Index (RI) –**

  It is a constant for a given pair of materials. In Lightwave, it is the setting that makes the difference between different kinds of materials.
Step 1

Load a **transparent, colored** object into Lightwave **modeler**.
- **Step 2**

  -- Make sure that you are in the “**Polygons**” mode
  
  -- Tap “**w**” to show Polygon Statistics window; Select the “**Glass_Int**” polys
Step 3

-- After selecting the "Glass_Int" polys, tap "=" to hide the other polys
Step 4

-- Drop selection

-- Select the **inside** polys in "Glass_Int":

Select the **inside bottom** ones first, and then expand the selection by using "\}" until you exceed the level where the cranberry juice will be.
Step 5

-- Tap "=" to hide the unselected polys

-- Use the "Knife" tool ("K+Crtl") to cut the top of the "Cranberry"

-- Drop the selection

-- Select those polys above the line (where the cranberry will be)

-- Tap "-" to hide them
Step 6

- Make sure that you are in the "Points" mode
- Select those points on the
- Tap "p" to combine them to make a poly as the top of the cranberry juice
Step 7

--- Tap "q" pump up the "Change Surface" window and name it "Cranberry"

Now we have a basic "cranberry juice" model!

Next ...

Because every kind of liquid has the viscosity when it meets the glass, there is a meniscus on the top of the liquid. In order to make the whole cranberry juice model more realistic, we would like to modify the top of the cranberry juice by the following steps...
Step 8

-- Go to the "Modes", select "Action Center: Selection"

-- Select the poly which is the top of cranberry

-- Tap "F" → Click → tap "H" → Drag the poly a little smaller → tap "t" → Ctrl + Drag the poly a little lower

-- Repeat these steps several times until get the desired meniscus
Step 9

Make it “real”!

-- Tap “F5” to open “Surface Editor” window

-- Setting for Glass:

  Glass_Ext
  Glass_Int (RI: 1.0)

“Options” tab:

  “Antialiasing”

“Environment” tab:

  “Ray Tracing + Spherical Map”

  “Reflection Blurring” set to “80.0 %”
Step 10

Make it “real”!

-- Setting for Cranberry:

RI: 1.35

“Options” tab:

“Antialiasing”

“Advanced” tab:

“Color Filter” set to “100.0 %”

“Environment” tab:

“Ray Tracing + Spherical Map”

“Reflection Blurring” set to “50.0 %”

-- Save your work
**Step 11**

**Render**

-- Go to Layout and load the object we just made ("JuiceGlass_Model")

-- Under **Rendering** tab:

  Draw down "Render Options" menu and select those options

-- Change "Ray Recursion Limit" number to "5" or another number which is a little bigger than 5 to reduce the rendering time
Ray Recursion Limit: 5
Rendering Time: 3m 43s

Ray Recursion Limit: 6
Rendering Time: 8m 18s
Summary

- **Procedure**
  
  Load a “well done” glass into modeler ➔ In the glass’ inter surface (air), select those “inside” polys ➔ Use “Knife” tool to cut out the “top of the liquid” ➔ Make a “meniscus” by using “smooth shift” if necessary ➔ Edit Surfaces (glass & liquid) ➔ Load it in Layout and Render, done.

- **Reminder**

  -- All kinds of liquid work exactly like the **cranberry juice**, but they have different RI values (i.e. water, coffee=1.33; milk=1.35; Beer=1.34; air=1.0)
  -- Color: Use your eyeballs
  -- Set “Reflection Blurring” in some number, not be Zero
  -- Lower the “Ray Recursion Limit” number, but NOT too small
Frame Range: 0 to 0
Frame: 0
Segment: 1/1
Pass: 1/1
Frame completed
Last Frame Rendered: 0
Resolution: 640 x 480
Antialiasing: Off
Radiosity: Off
Caustics: Off
Motion Blur: Off
Field Rendering: Off
Stereoscopic Rendering: Off
Depth of Field: Off
Output Files: (none)
Rendering Time: 9.3 seconds

Not Nice!
This is something I have learned about how to present the liquid in a glass.

Some useful websites I used:

http://www.robinwood.com

http://webreference.com/3d/lesson21/

Hope this tutorial will give you some helps. Thank you!