LAB 7: MATERIAL PROPERTIES IN 3DS MAX

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Create the following scene geometry (You may try something more interesting if you wish but this lab is not really about the geometry)

- A sphere and cylinder with a reflective surface
- A plane/box with a texture and bump map
- An environment map
- A light source (Enable shadows)
TEXTURED OBJECTS (1)

- Open the Material Editor by clicking on the Material Button to create new Materials (or press M).
- Ensure you are using the Compact Material Editor.
- If this is not already selected, click on Modes → Compact Material Editor…
- Select a free Material slot
  - click on any grey sphere
- Now expand the Maps roll-out section
  - click on the + next to “Maps”
  - this will change the available options (see next slide)
TEXTURED OBJECTS (2)

...After expanding the Maps roll-out section

- Click the tick box on next to Diffuse Color
- Click on the Map button on the Diffuse Color row

- By default this is set to “None”
- This will open the Material/Map browser (see next slide)
**TEXTURED OBJECTS (3)**

- Under the Standard group, double click on Checker.
  - This will change the current material (the sphere should now be textured).
- To apply it: Drag the output of the material node onto any object in one of your modelling windows.
  - To see this in the Modelling window click on the Show Shaded Material in Viewport Button.
- Edit parameters of the Checker Map.
  - e.g. You may want to increase the Tiling or change the colours.
Navigating Between Maps and Material

Note that materials may have multiple maps. When you assign a map to a material, the menu changes to the map settings.

- If you want to go back to the parent material or other maps, click on “Go To Parent” Button.
- To edit parameters of a specific map, click on the relevant Map button.
BUMP MAPPED OBJECTS

Bump maps images (usually greyscale) can be used to give an object a embossed/look

In order to assign a bump map...

- Choose a blank material and Open the Maps roll-out
- Create a “Bump” Map, by clicking on the button in the corresponding row (by default, set to “None”)
  - You can change the “Amount” value to increase the intensity of the bump effect
- In the Material/Map Browser, double click on Bitmap to load an image as a bump map
  - Navigate to your bump map image and select it
  - Alternatively you can use a procedural map
- Assign the material to an object in your scene by dragging it onto an object
  - Note that this won’t show correctly in the editor window. You need to Render the scene to see the bumps properly
The “Reflection” map can be used to create highly reflective objects (e.g. mirrors, shiny metal)

One way of doing this is to assign a Raytraced shader to the material ...

- Choose a material and Open the Maps roll-out
- Create a “Reflection”, by clicking on the Material button in the corresponding row (by default, set to “None”)
- In the Material/Map Browser, double click on Raytrace
- You can change the “Amount” value to increase the strength of the reflection
- Assign the material to an object by dragging it from the palette to an object in your scene

Note that this won’t show correctly in the editor window. You need to Render the scene to see the bumps properly

You may also need to add an environment map for good reflection effects (see next slide)
Environment maps are used to represent the rest of the scene as an image.

- For testing, download this sky texture (or get one of your own): [http://www.scss.tcd.ie/John.Dingliana/cs7029/skysphere.jpg](http://www.scss.tcd.ie/John.Dingliana/cs7029/skysphere.jpg)
- Select an empty Material (grey sphere), then click on Get Material
- In the Maps/Materials browser double click Bitmap
- Browse to your sky texture and load it
- You should see a square instead of the usual sphere in the materials palette
  This indicates it is a Map and not a Material
  You cannot assign this to a geometrical object but it can be used as subcomponents of other materials
- Click on the new sky map to see its settings
- Under Coordinates, select Environment and Mapping type “Spherical”
On the Main menu click on Rendering and then Environment...

This will open the “Environment and Effects” window.

From the Material Editor, drag the skysphere map to the Environment Map button in the Environment and Effects window.

In the pop-up window, select Instance and click OK.

Make sure the Use Map checkbox is ticked.

If you render your scene, you should now see the sky sphere texture.
LIGHT SOURCE WITH SHADOWS

On the Command Panel, select the Create Tab, click on Lights.

- Work with “Standard” lights for now
- Simplest is an Omni light this is a point light you simply place in the scene – use this for now

- To enable shadowing: lower down on the command panel and under “General Parameters”, in the Shadows box, tick On
- You can experiment with the type of shadow rendering but “Ray Traced Shadows” should be good enough for now

- Click somewhere on one of the modelling windows to place the light source (it can be transformed like any other geometrical object)
OTHER THINGS TO TRY

- Displacement Mapping
- Ambient, Specular maps etc.
- Image textures and other patterns
- Soft shadows i.e. area lights
- CSG (see next slide)
CSG IN MAX

Select an object in your scene (this will be referred to as Operand A)

In the create tab, select Geometry

- In the pull down menu, select “Compound Object” then Object Type: Boolean

Click on Pick Operand B and select a second object to combine with

Select what operation you want to perform (union, intersection, subtraction ...)

![Image showing the process of creating CSG in 3ds Max](image-url)