Animation process

Texturing
Common types of “maps” (textures)

- Colour (Pigment)
- Bump
- Specularity / Specular size / Specular intensity
- Transparency / Cookie-cut
- Diffuse (Dirt)
- Reflection / Environment
- Ambiant (Glow)
- Displacement
Texture type: Colour (image)

- Paint
- Wallpaper
- Contact
Texture type: Bump

- A shading trick
- Doesn't actually change object geometry
- Works well with colour map
Texture type: Specularity (shiny highlights)

- Lighting adds even more reality
Texture type: Transparency

Remember, you are usually dealing with surfaces, not real solids
Other texture types:

- Diffuse (dirt and grime)
- Reflectivity and environment maps
- Ambiance/Luminosity maps (fake glow)
- Displacement (actual geometry change)
- Cookie-cut (1-bit variation of transparency)
- Specular size (as well as intensity)
Applying the map = mapping

How to stick a map to a surface

- Flat
- Cylindrical
- Spherical
- Cubical
- UV (unwrapping) / decal
- Algorithmic texture
Mapping type: Flat

- Like wood grain through the wood
- Angular stretching, perpendicular “smearing”
Mapping type: Cylindrical

- Wraps vertically around object like a “leg warmer”
- Top and bottom surfaces derived from texture projecting into center
Mapping type: Spherical

- Variation of cylindrical
- Top and bottom surfaces derived from texture “wrapping” around (pinched in)
Mapping type: Cubical

Texture applied from 6 directions
Mapping type: UV / decal

- Stick-on texture, conforming to object shape
- “Rectangles”
- Mapping onto each facet
Mapping type: UV (per facet)

“Unwrapping” the object = UV mapping

- LithUnwrap
- UVmapper
Creating texture maps: painting
Creating texture maps: algorithmic

- Formula-based “solid” textures
- Alter various aspects e.g. colour, degree of variation, ratio of various elements
Mapping example: plain model

- An alternative tower
- Created using spline-based software
Mapping example: algorithmic

- Algorithmic texture used for colour and bumpmap
- Cylindrical mapping part of the algorithmic texture
Mapping example: plain model

Lips created in spline-based software
Mapping example: plain colours

Assigning colours directly to “patches” (the curved non-linear spline equivalent of polygonal facets)
Mapping example: add colour map

Colour map added
Mapping example: add bump map

- Bumpmap added
Mapping example: add specularity

- Specularity map added
2D Texturing
The problem with 2D

- Difficult to make texture “stick” to animated 2D shape (in vector software)
- Ink&Paint programs require re-painting the text for each new frame
Workaround 1: just don't care

- Allow texture to “show through”
- Okay for some stylised cartoons
Workaround 2: shapes as texture

- Create the texture as part of the 2D shapes
- Only for limited textures
Workaround 3: 3D software for 2D

- Use your 3D software, but limit the shapes and animation to 2D
- An increasing number of 3D packages have “toon rendering”
Workaround 4: paper puppets

- Move entire pieces of 2D texture
Workaround 5: image warping

- Similar technique to morphing, but without the “cross-fade”
The best solution is often a mix

- Using limited image warping on separate 2D pieces

- Mix of
  - Separate pieces
  - Image warping on each piece
Note to remember:

- An algorithmic texture can be rendered to a bitmap and then used as an image map (for both 3D and 2D)
- Computer animation: if you can't fix it by cheating, you're not cheating enough