

# 7.1 Virtual Reality and VRML



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# VRML

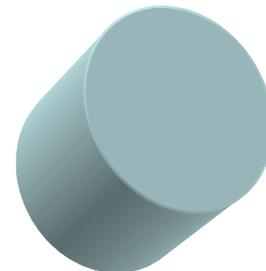
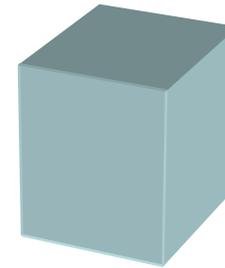
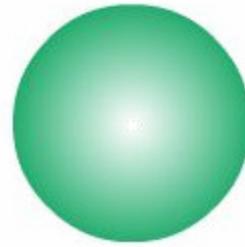
- Virtual Reality Modeling Language
- First Method for 3-D on World Wide Web

# The nature of VRML

- VRML is based on a hierarchy describing a scene of 1 or many objects.
- Contains basic geometric shapes which are used to place objects in the virtual world using shape nodes.
- They can be combined to produce more complex objects.
  - Eg. Box, Cylinder, Cone and Sphere

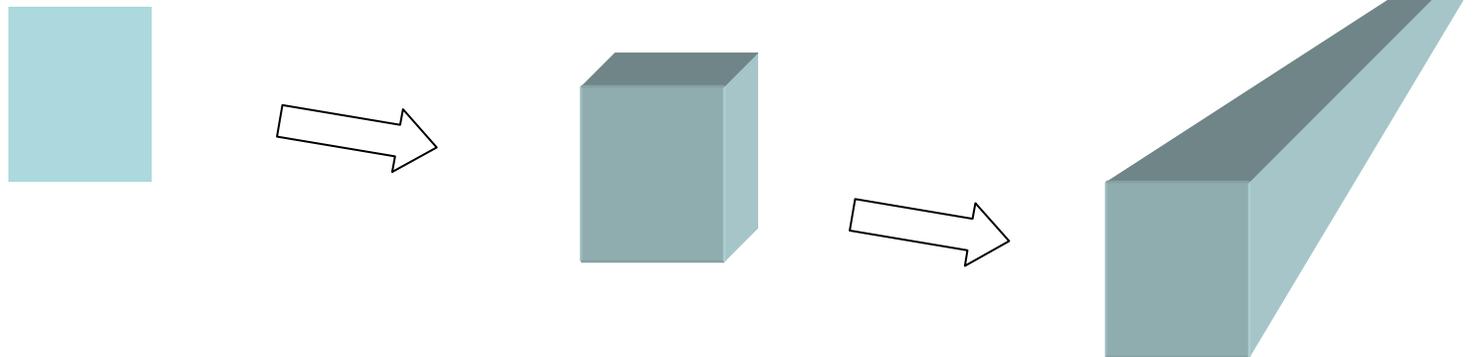
# VRML Basic Geometric Shapes

- Also called basic shapes
  1. Box
  2. Sphere
  3. Cone
  4. Cylinder



# Extrusion

- An extrusion is a 2D cross section extruded along a spine



# IndexedFaceSet

- A set of faces which make up an object
- Allows creation of complex shapes because arbitrary numbers of faces are allowed.

# Material Node

- Specifies an object's surface properties.
- Controls color (through RGB values) and reflection of direct and indirect light from objects.
- Also deals with specular and emissive colors as well as the transparency of the objects.

# Texture Nodes

- 3 types
- **ImageTexture** - can map external JPEG or PNG image onto the shape. It's the most common.
- **MovieTexture** – can map an MPEG movie onto object (can also specify start/stop times).
- **PixelTexture** – creating an image to use with **ImageTexture**.

# Transform Nodes

- Used for arranging shapes
- Can contain Translation, Scale and Rotation nodes

# Lighting

- 3 types
- **DirectionalLight** – light across the world in a certain direction, like sunlight.
- **PointLight** – light in all directions from a certain point in space
- **SpotLight** – light in a certain direction from a point

# Animation with 3-D

- Only method is tweening – possible by changing an object specified in an interpolator node.
- 6 Interpolator nodes – color, coordinate, normal, orientation, position and scalar
- **TimeSensor** – this node times an animation letting the interpolator node know the stage the object is in. It has no physical form in VRML.
- Environment sensors and pointing device sensors obtain input from user.

# Using a search engine, find out more...

- **VisibilitySensor, ProximitySensor, Collision**
- Touch sensor, drag sensor