

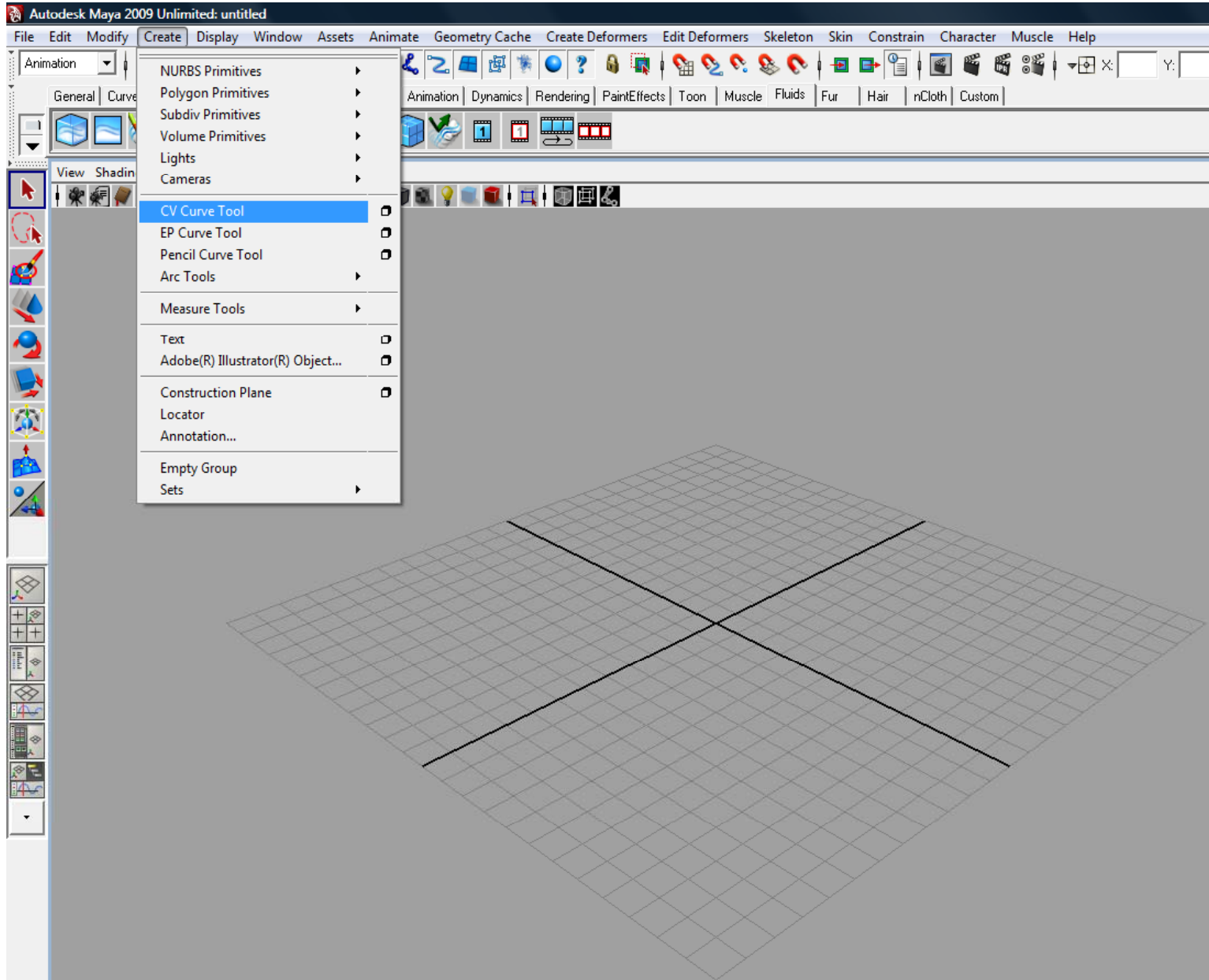
Maya Animation Technical Group Presentation

CSE 682 with Dr. Rick Parent

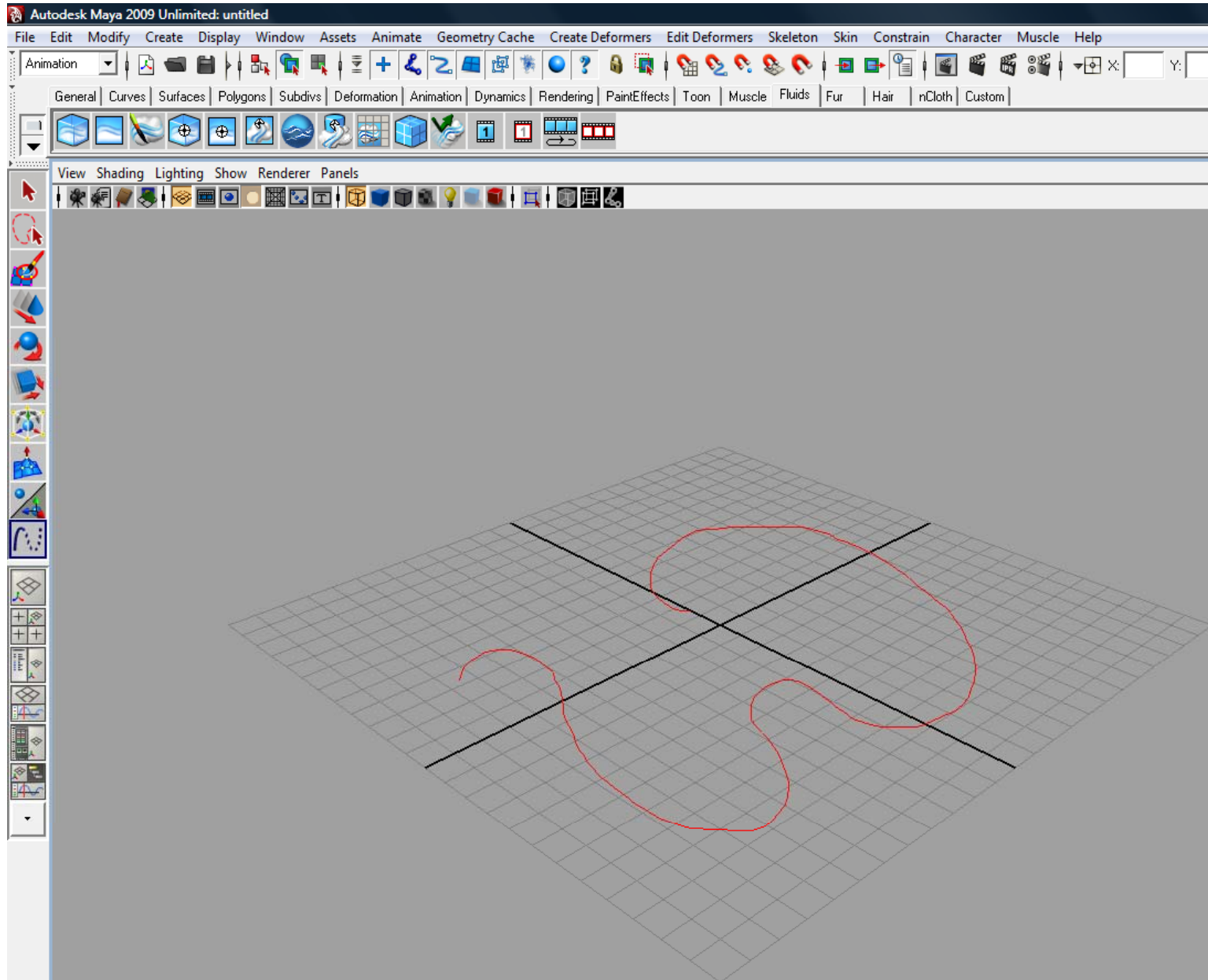
14 January 2009

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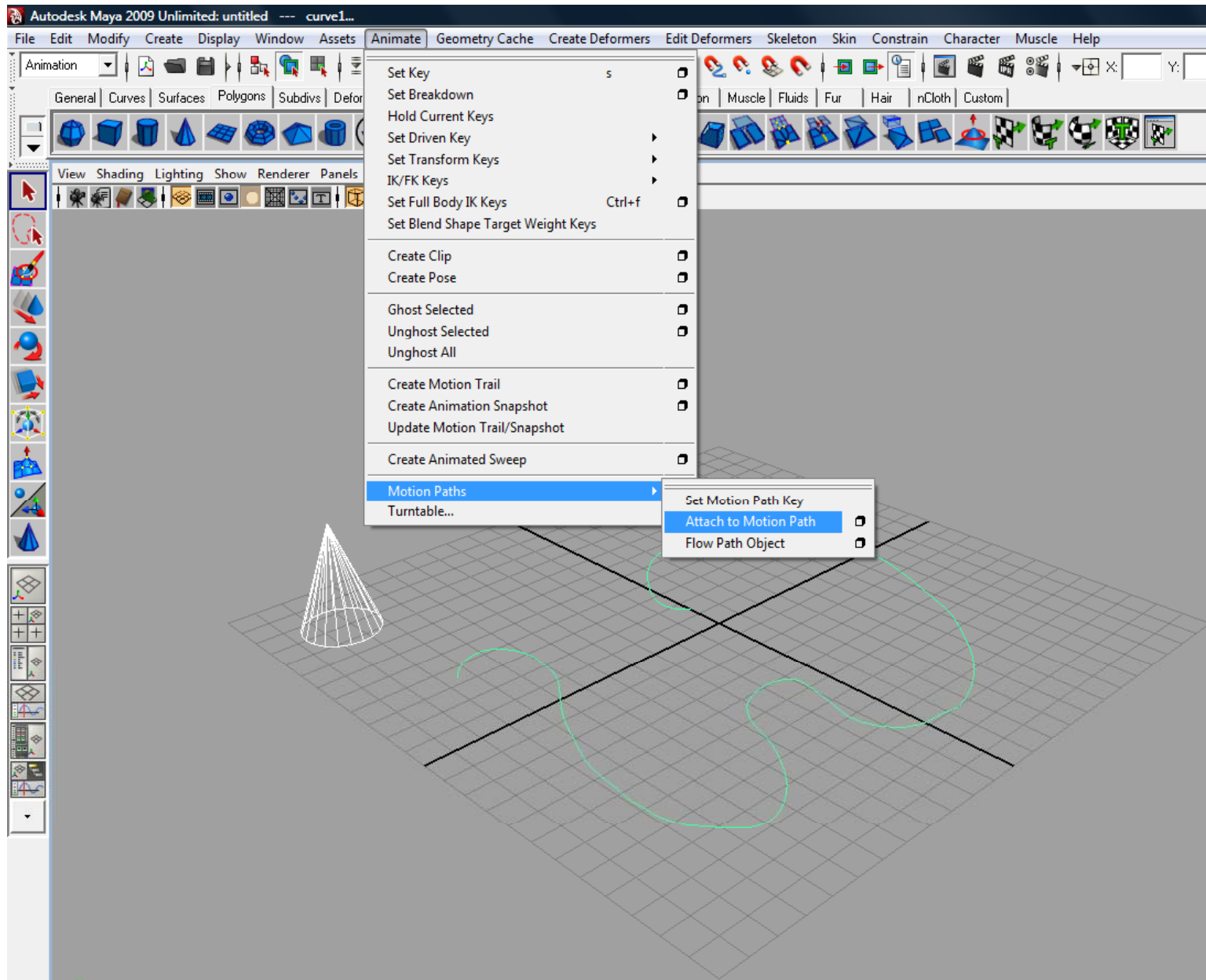
Path Animation



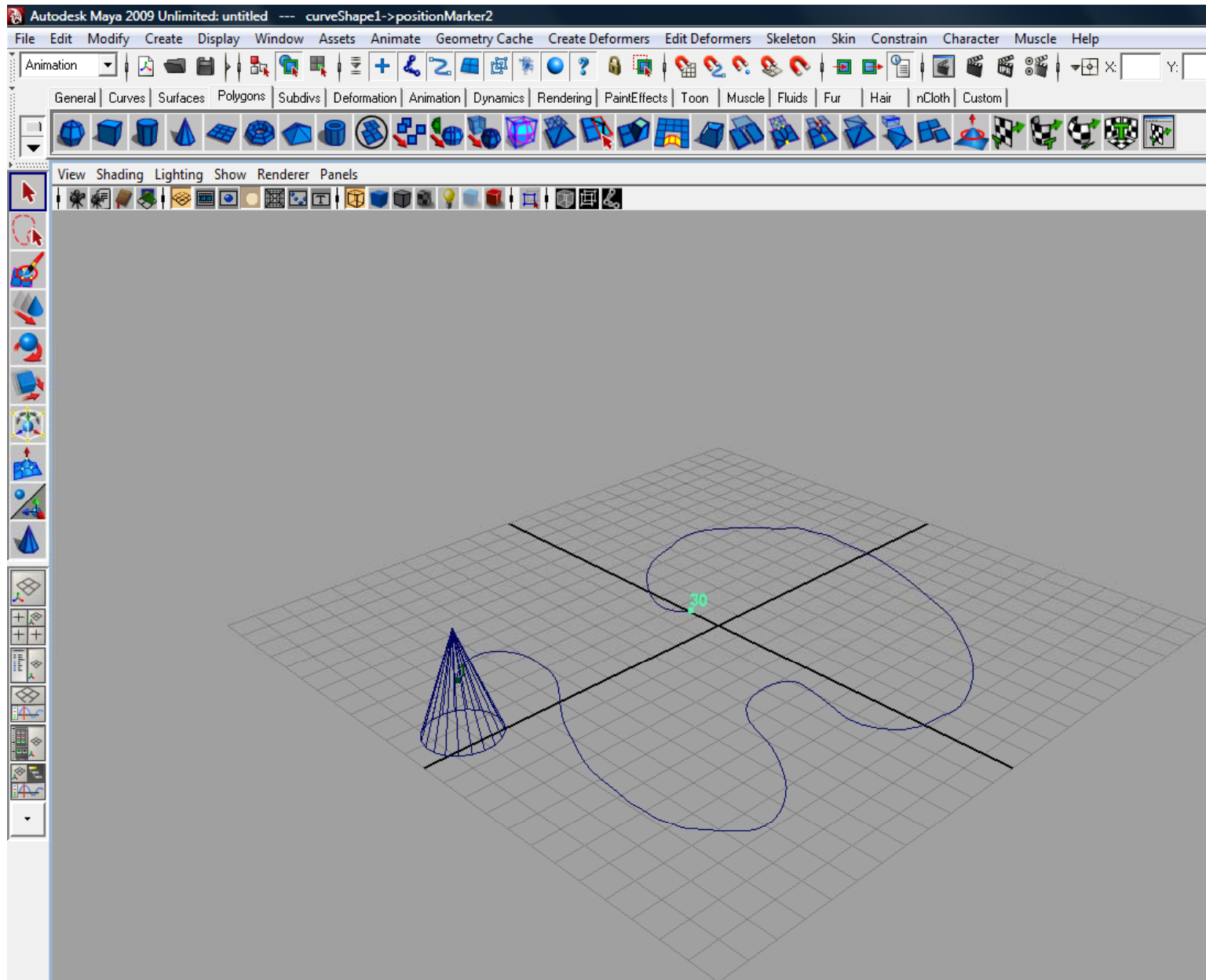
Creating a Path



Attaching an Object



Setting Parameters



Keys

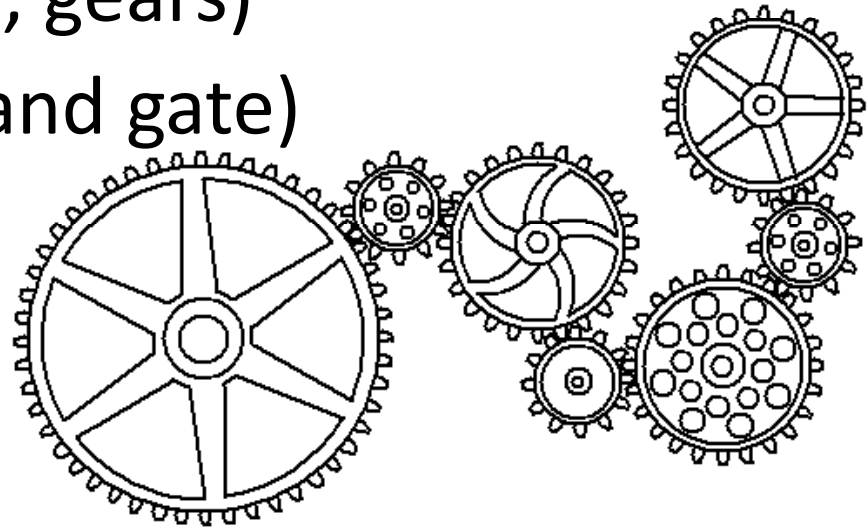
- Keys record the position of all or specific values for the properties of an object at a certain time of the animation.
- Maya linearly interpolates the values for those properties for the frames in between when they have changed in between keys.
- Keyframe animation is a simple way to move objects in an animation in Maya by recording keys for their initial and final position at certain times and Maya will move the object between those points.
- Can also use keys to change the size of objects or rotate them over a certain time.

Graph Editor

- Allows you to change how Maya interpolates the intermediate values of the attributes in the frames between keys
- Can be used to make movement more realistic, such as slowing the movement of an object sliding on a surface to simulate friction.
- Movements such as a ball bouncing can be recreated in the graph editor.

Driven Key Techniques

- Links attributes of an object to attributes of another
- Compare to event-based programming
- Synchronization (e.g., gears)
- Reaction (e.g., train and gate)

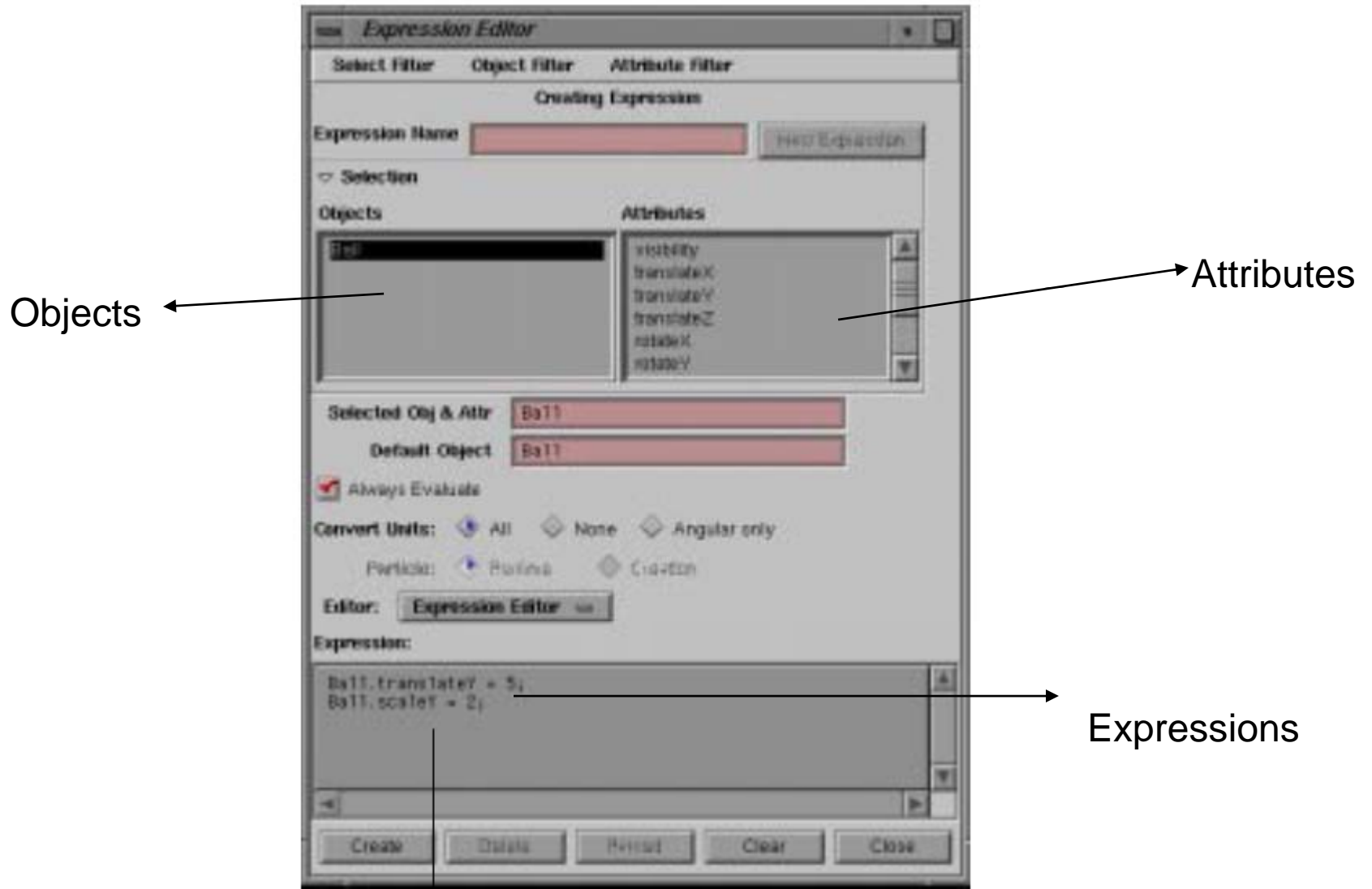


What are Expressions

- Instructions you type to control an object attribute over time
- Useful for linking attributes between different objects—where a change in one attribute alters the behavior of the other.
 - For instance, the rotation of a tire depends on the forward or backward movement of a car
- Example

```
Ball.translateX = Cube.translateX + 4;
If (frame == 1)
    Cone.scaleY = 1;
Else
    {Cone.scaleY = (0.25 + sin(time)) * 3;
print(Cone.scaleY + "\n");
```

Expression Editor



Useful tip

- Examine the Script Editor for error messages after you edit an expression and click the *Create* button. If you alter a previously successful expression and a syntax error occurs, Maya executes the previous successful expression when you play the animation. This might make you believe your editing changes took effect
- Very powerful and easy to use

PARTICLE SYSTEMS

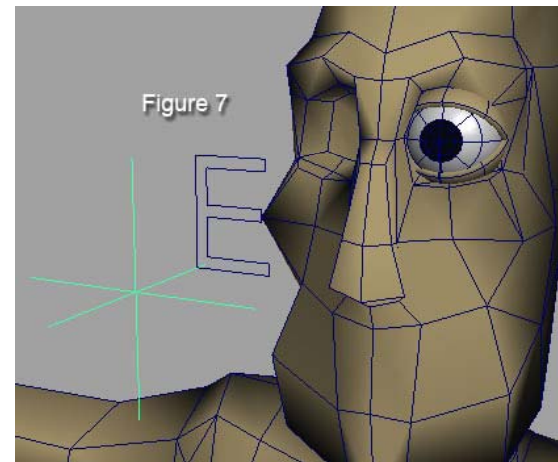
- What are particle systems?
- Generation, attributes, termination
- Particle animation
- Applications
- A particle system using MAYA

FK and IK linkages

- Forward Kinematics (FK): Manual animation with joints
- Inverse Kinematics (IK): Dynamic animation with joints
- Skinning: Using textures and objects with joints

Locators

- Locators are null objects in Maya
- Uses include visual reference, attaching custom attributes, measuring distances, and aiming
- Can be found under Create > locator
- Locators do not render

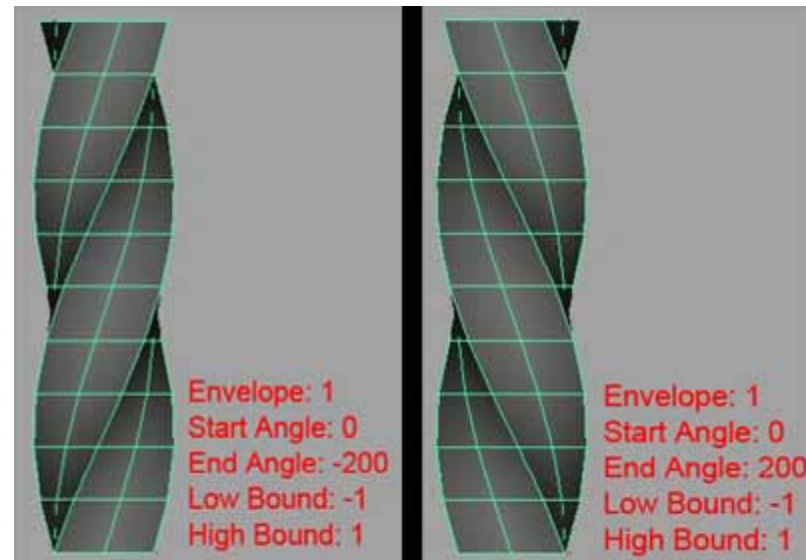


Deformers

- Deformers are used in modeling and animation.
- In order to use must have at least one object and a deformer, then create under the Animation drop menu Create Deformers >
- Deformers can be placed in different places in the object definition order
- Deformer attributes can be keyframed for animation

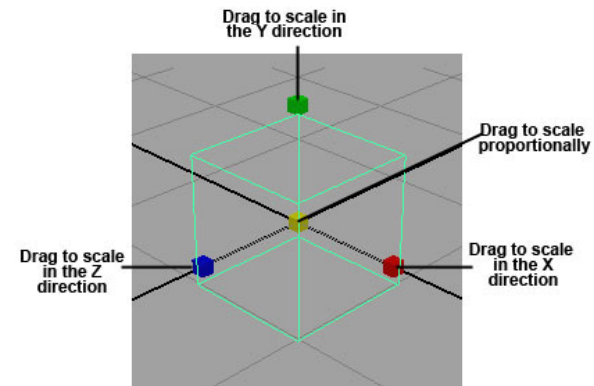
Deformer Types

- Blend Shapes
- Lattice Deformers
- Cluster Deformers
- Non-linear deformers: bend, flare, sine, squash, twist, wave
- Sculpt
- Wire
- Wrinkle
- Wrap



Manipulators

- Maya manipulators are the tools used to manipulate objects manually
- Keystrokes can select tools:
 - W – Translate
 - E – Rotate
 - R – Scale
- Best control when only manipulating one dimension (x, y, z) at a time



Constraints

- Constrain the position, orientation, or scale of an object to other objects
- Set specific limits on motion of object

Types of Constraints

- Point
- Orient
- Parent
- Scale
- Aim
- Geometry
- Normal
- Tangent
- Pole Vector