Basics of Facial Rigging and Animation

For reading, Maya Character Animation Ch 5.
Mimic real muscle structure for most natural movement. (linear/parallel v. elliptical/circular)

- Obicularis oculi.
- Levator labii and zygomaticii.
- Obicularis oris.
- Frontalis and corrugator.
- Smooth, even contours (edges or isoparms).
- Quad faces for polygons or subdivision surface models.
- Avoid triangles, odd vertex intersections, etc.
Approaches to facial rigging.

- Skeletal structure similar to character joints, ranging from jaw only to numerous joints for deformation control.

- Single or multiple morph targets. (BlendShapes in Maya).
Facial Skeleton
Paint skin weight tool.
Begin with identical models so that number and naming of vertices will match.

Manipulate model to a given expression.

BlendShape deformation creates a linear equation from one set of vertex locations to the other. (0 to 1 but may be exaggerated).
Important shapes:

- Six universal emotions.
- Visemes for speech.
- Other particular traits for character.
Six universal emotions

Happiness -- raising and lowering of mouth corners.

Sadness -- lowering of mouth corners, raising inner portion of brows.

Surprise -- brows arch, eyes open wider, jaw drops.

Fear -- brows raised, eyes opened, mouth opened slightly.

Disgust -- upper lip raised, nose bridge wrinkled, cheeks raised.

Anger -- brows lowered, lips pressed firmly, eyes bulging.
Visemes v. phonemes

Phonemes -- basic blocks of sound for speech, around 46 in English but varies. Most people use fewer.

Around 14 visemes. (Use in animation varies from 2 to >14).
Lipsync

- Import audio file. Display in timeline.
- Match major opening/closing movement.
- Follow vocalized sections and consonant/noise sections.
- Not strictly “pose-to-pose” but several movements happening simultaneously.
Exercise