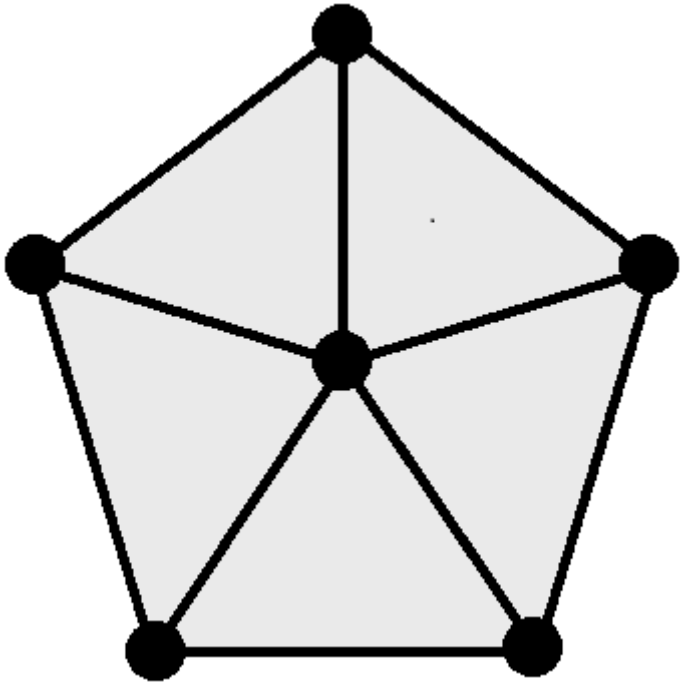
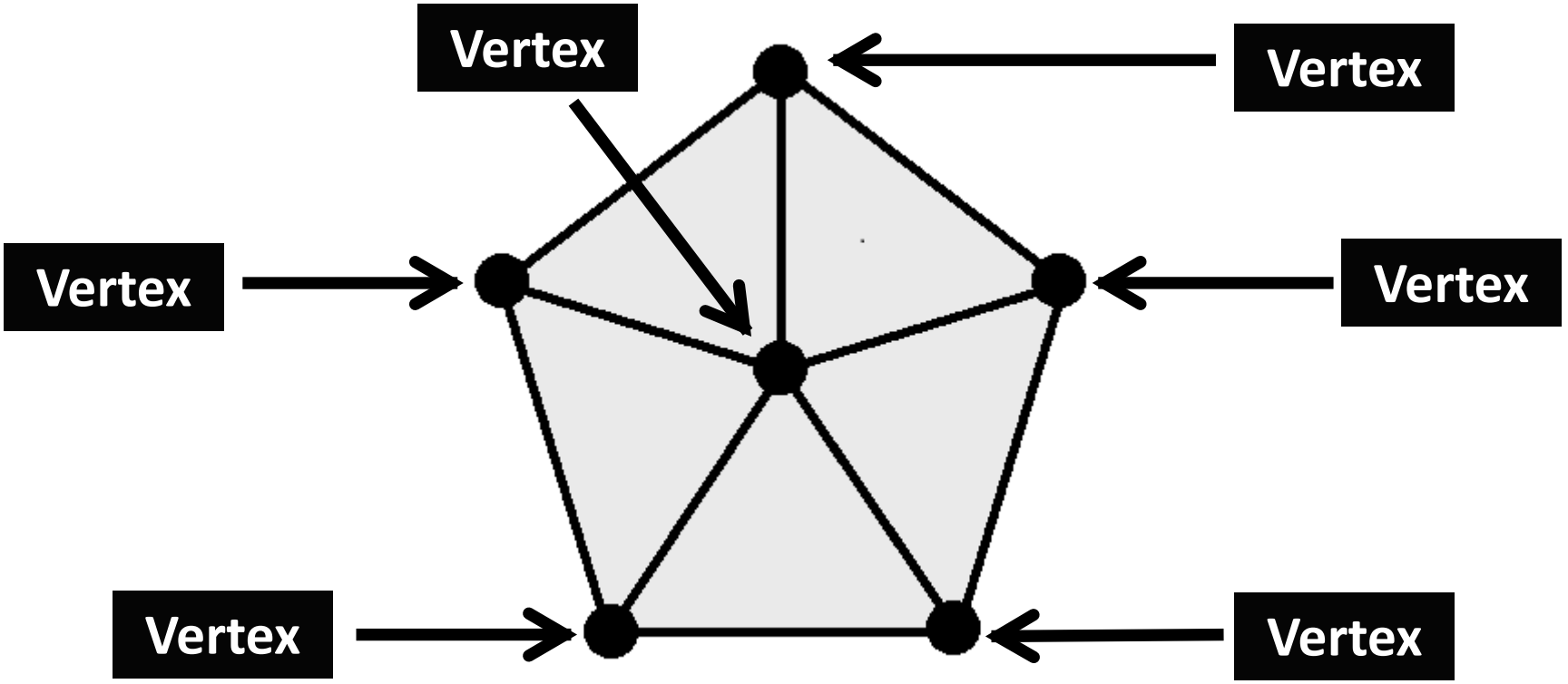
Meshes

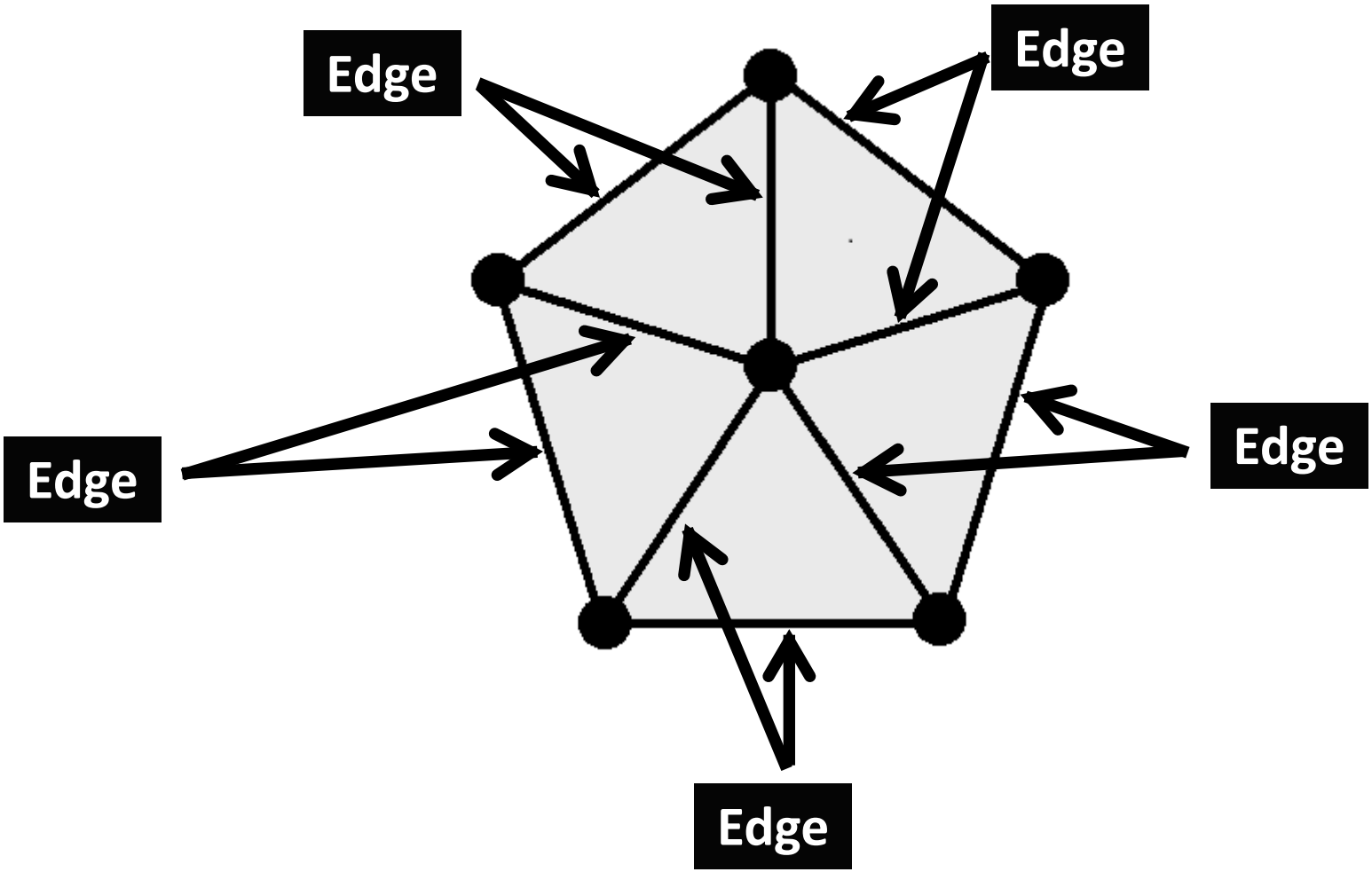
Mesh: Anatomy



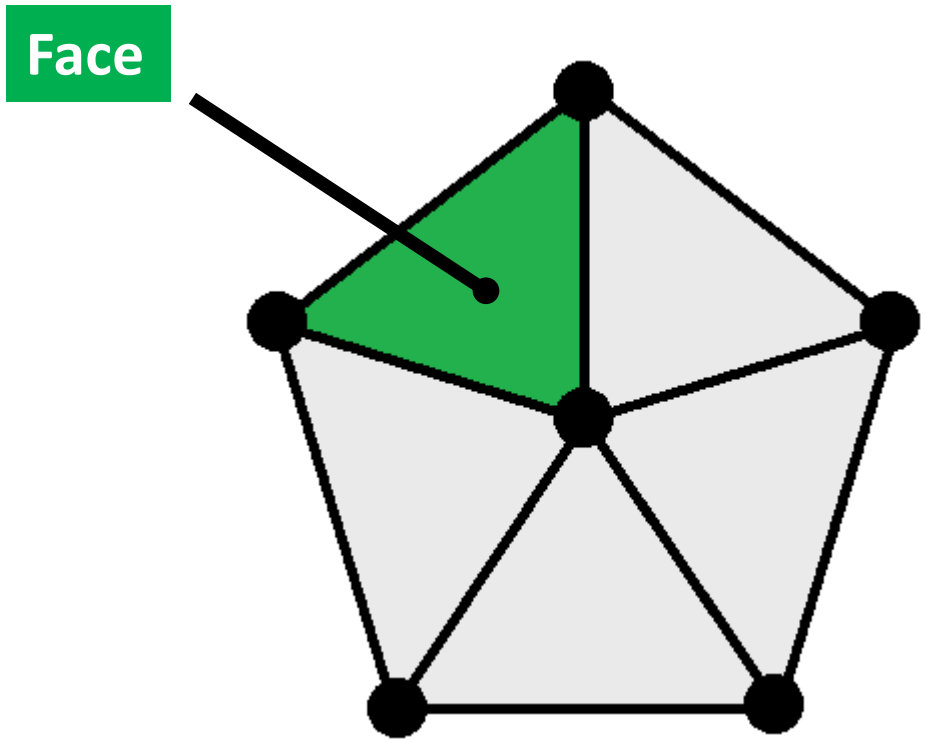
Mesh: Anatomy



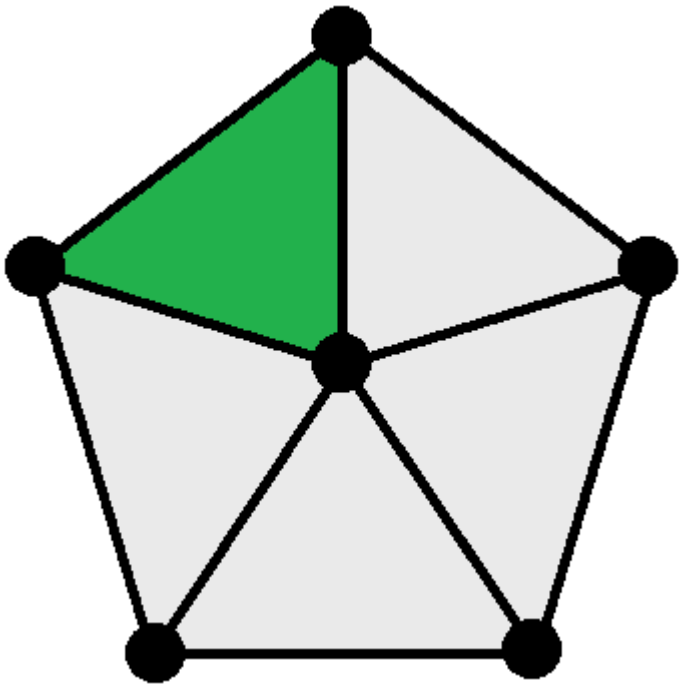
Mesh: Anatomy

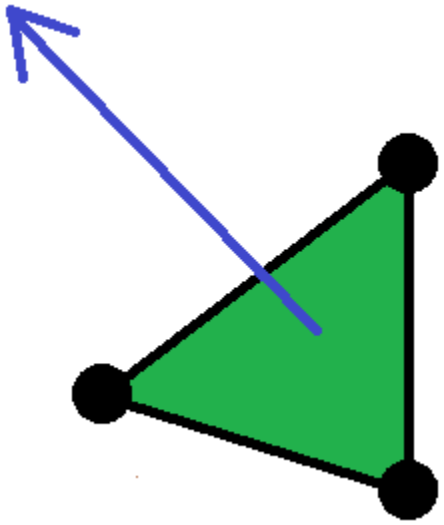


Mesh: Anatomy



Mesh: Normal

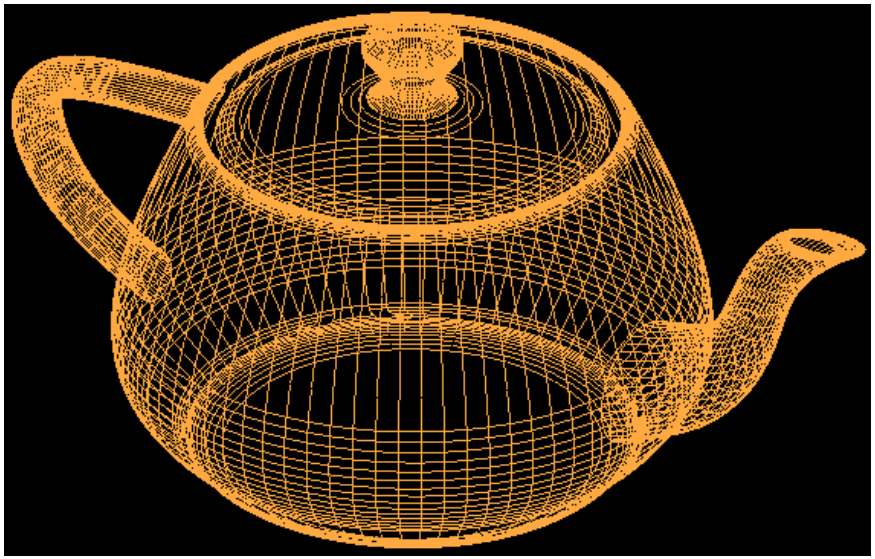




Normal for the face (blue arrow) is perpendicular to the surface.

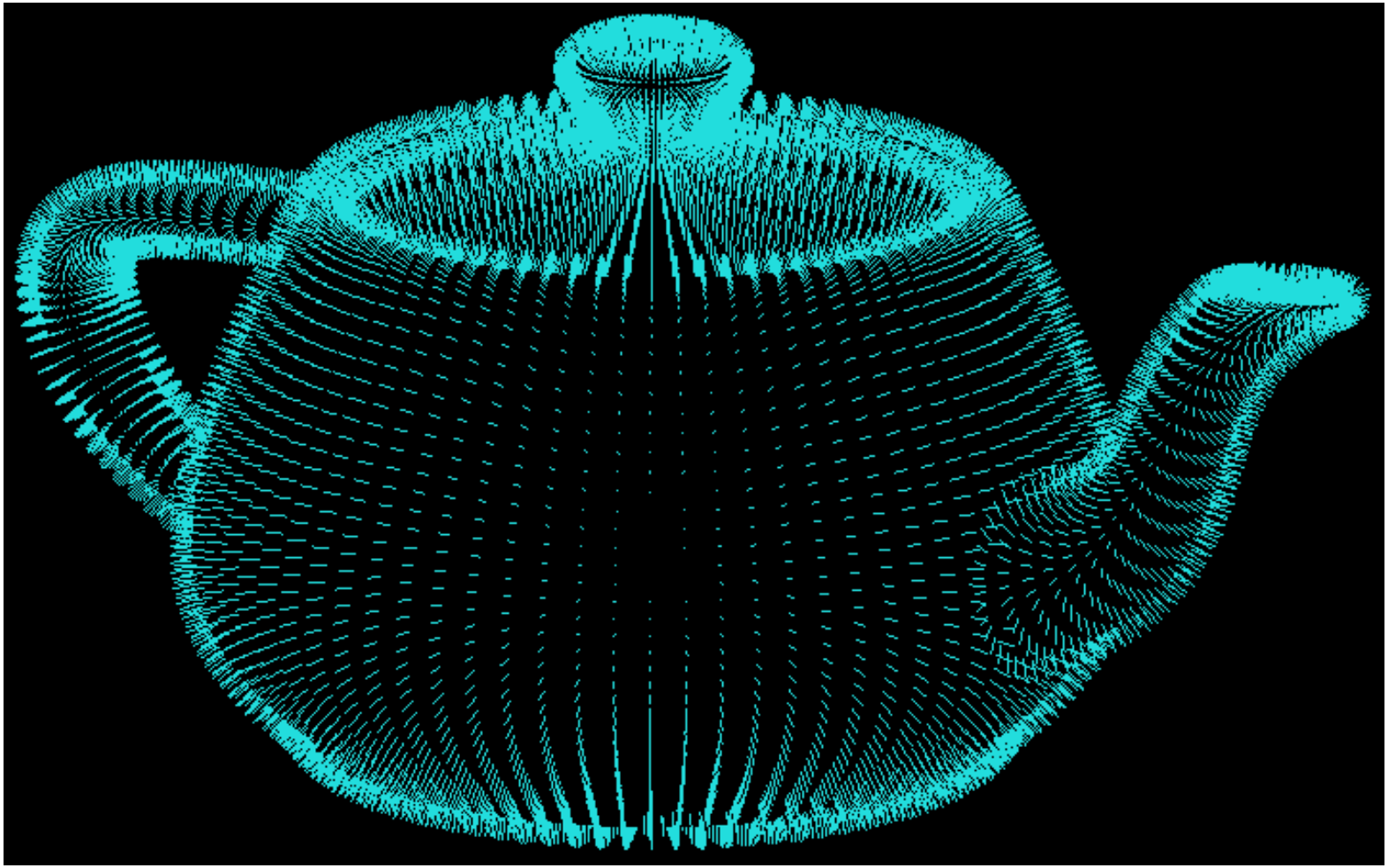
Meshes

Smooth shading on a solid surface



Wireframe mesh.

Mesh: Normals



The blue lines indicate direction of the normal for each face.

Mesh: Normal

- Normal
  - Indicates the direction light will reflect from the surface.
  - Check to make sure the normal isn’t inverted (pointing inside).
  - Inverted normals may result in dark spots on the surface where the light doesn’t reflect.

Traversing a Mesh: Reasons

- Why traverse a mesh?
  - To describe the shape (edges, faces, and vertices).
  - To determine how light reflects off surface.
  - For animation: think in terms of cloth simulation
  - For collision detection (when two surfaces collide) how should these surfaces interact?
  - To create an OBJ (Alias/Wavefront format file) for importing a mesh description into modelling or CAD software.

Describing a Mesh: Methods

- Common methods for describing a mesh:
  - Face-vertex
  - Winged-Edge
  - Half-Edge
  - There are other methods as well!

For further reading…

- Mesh lab open source software
  - http://meshlab.sourceforge.net
- OpenMesh
  - http://www.openmesh.org
- Computational Geometry Algorithms Library
  - http://www.cgal.org
- Massive list of mesh manipulation software
  - http://www.robertschneiders.de/meshgeneration//software.html
- Geometry in Action: Mesh generation
  - http://www.ics.uci.edu/~eppstein/gina/meshgen.html