ISTA 352

Lecture 23

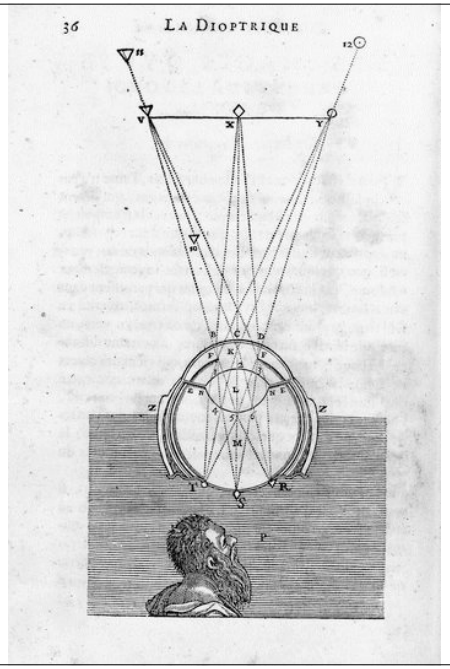
Making images look real

Creating realism

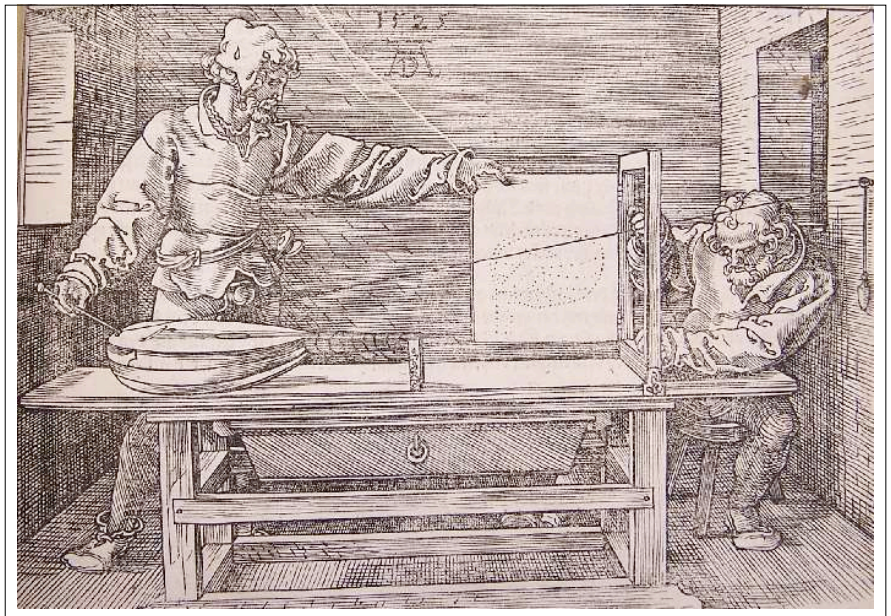
- What makes images look more real? Correct
  - Perspective
  - Stereo
  - Shading
  - Color and specular reflection
  - Shadows
- Why does it work to do that?
  - This is the information that your brain is used to interpreting

Perspective

- We have learned the graphics version
  - Elegant, efficient, tuned version of the mathematical story
  - Easy to understand give modern knowledge about light and coordinate systems, etc.
- Artists have taken various approaches over the ages
  - Various interests in getting it right
    - Early work often sized objects based on spiritual importance
  - Generally understood that making further objects smaller increased "illusionism"
  - Formal recipes based on mathematics emerged during the renaissance
    - Early catalyst was translation of Alhazen's *Book of Optic* (13'th century)
    - Further developed somewhat independently in the north of Europe (especially Holland)



Descarte, 1637



Albrecht Dürer, *Underweysung der Messung* (1538)

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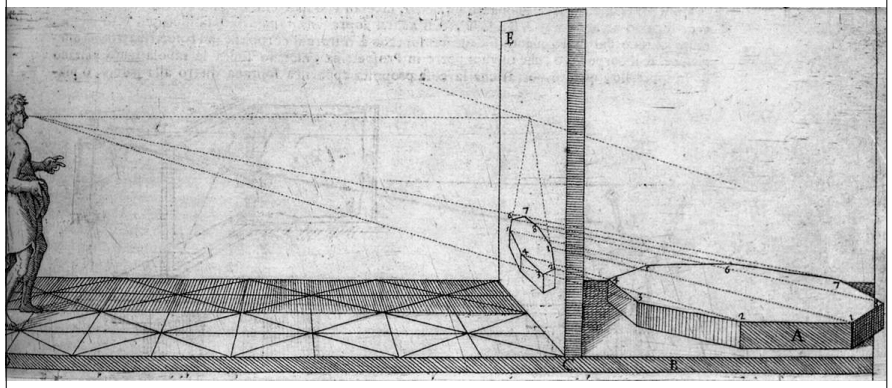
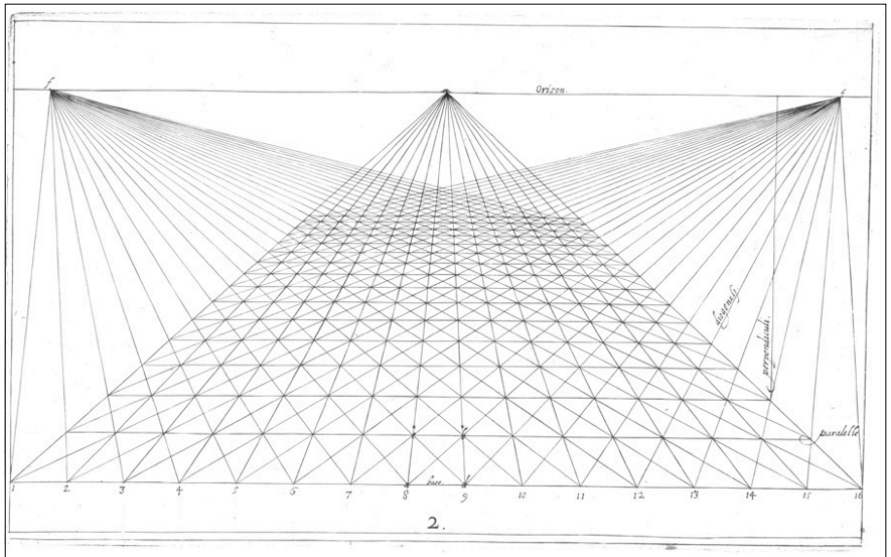
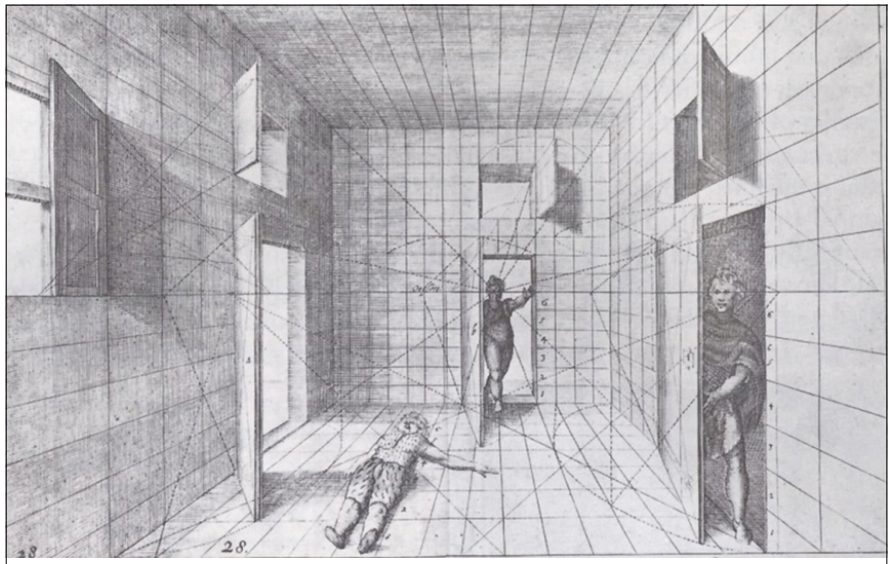


From Vignola's treatise Le Due Regole della Prospettiva Practica, 1583.



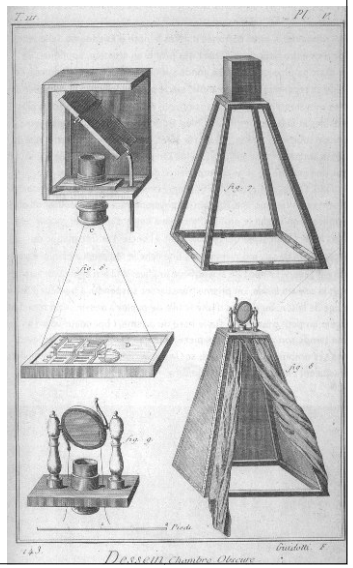
Jan Vredeman de Vries, *Perspective*, 1604-5 (plate 2)



Jan Vredeman de Vries, *Perspective*, 1604-5 (plate 28)

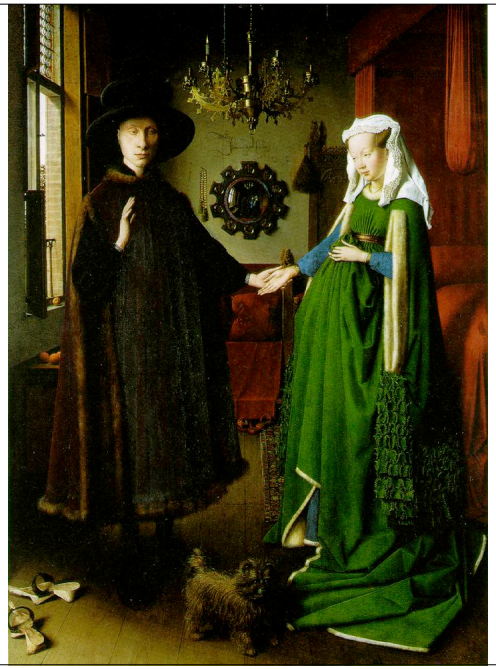
Physical optics and perspective

- Perspective can be verified using mirrors and other optics
  - Evidence of this being done in Italy in the 15th century
- One can trace a projected image to get excellent perspective
  - Devices for projection are known as *camera obscura*



Physical optics and perspective

- Perspective can be verified using mirrors and other optics
  - Evidence of this being done in Italy in the 15th century
- One can trace a projected image to get excellent perspective
  - Devices for projection are known as *camera obscura*
  - There is intense debate on how it was used by the dutch masters
    - The "chandelier" image has been claimed to be done this way
      - An example from the Hockney-Falco thesis
      - Your results from assignment two might argue otherwise
    - Perspective does not need to be exact to make it work



The Marriage of Giovanni Arnolfini and Giovanna Cenami, Jan van Eyck,1434

Detail from “The Marriage of Giovanni Arnolfini and Giovanna Cenami”, Jan van Eyck,1434

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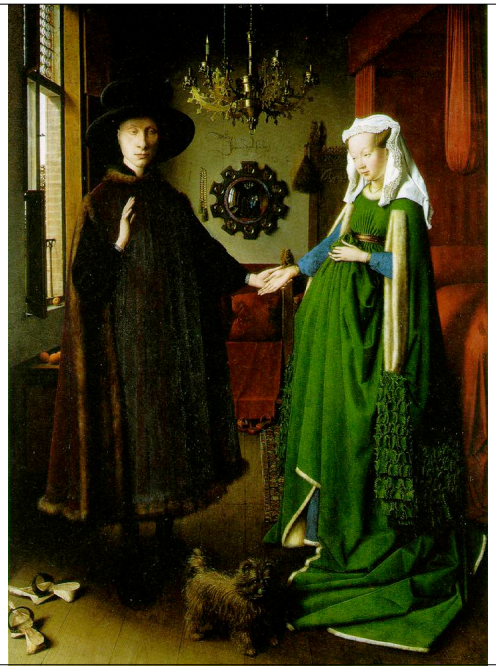
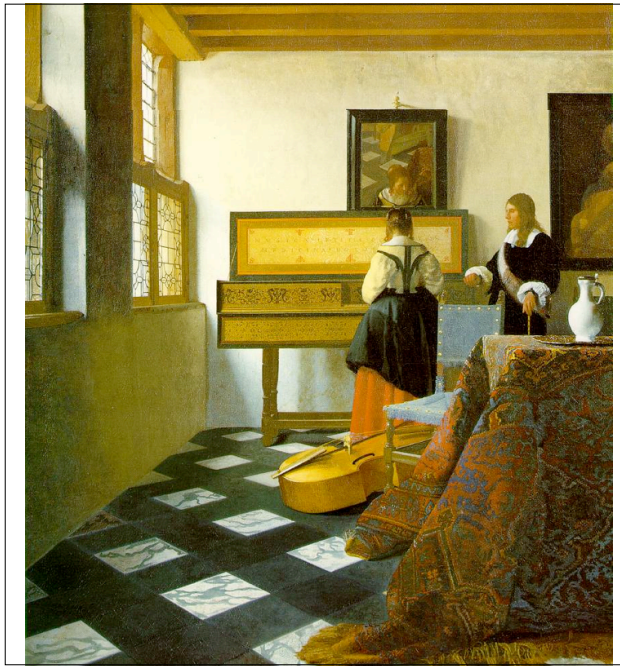
Shading to add depth



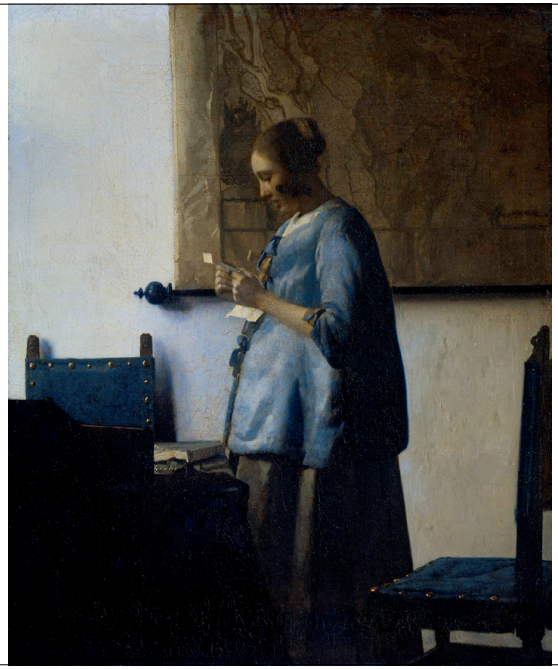
The Marriage of Giovanni Arnolfini and Giovanna Cenami, Jan van Eyck,1434

Jan van Eyck,
Annunciation,
1434

Jan van Eyck, *Diptych of the Annunciation*, c. 1435-1440



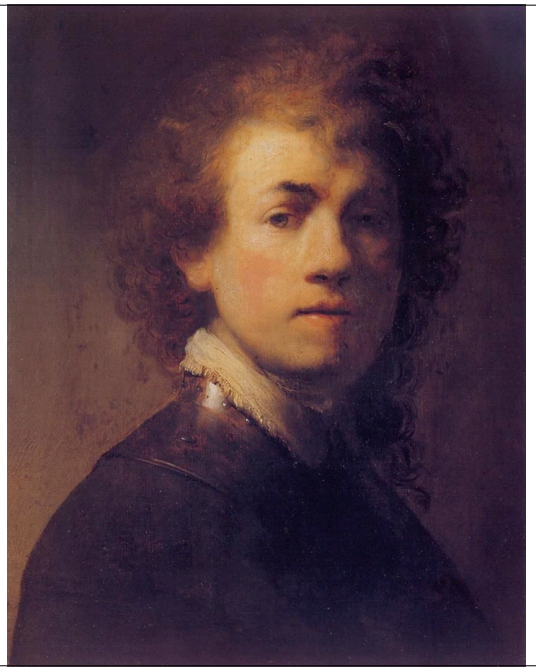
The music lesson
Vermeer,
1662-65



Woman in Blue
Reading a Letter
Vermeer,
1662-63

Lady Writing a Letter with Her Maid

Vermeer, 1670-72



Rembrandt, Self portrait, circa 1629

The Storm on the Sea of Galilee, Rembrandt, 1633.

Interpreting shading

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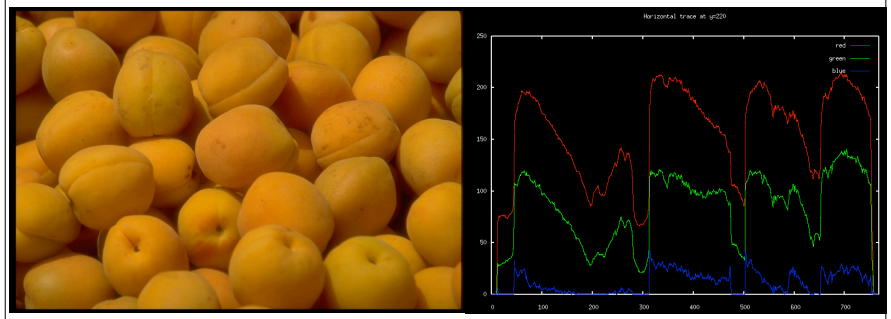
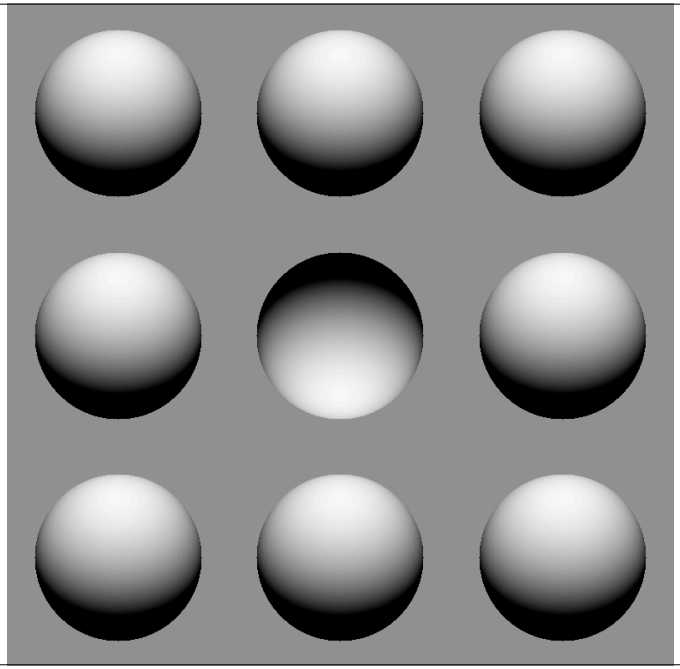
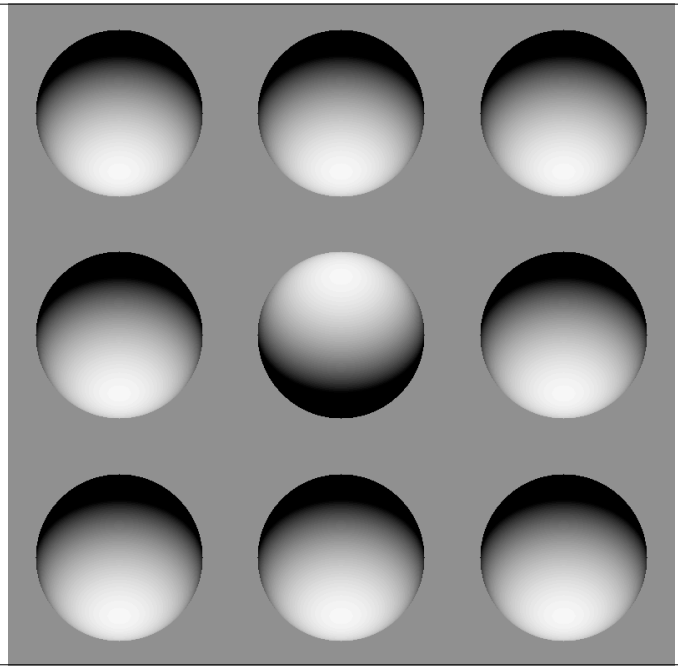
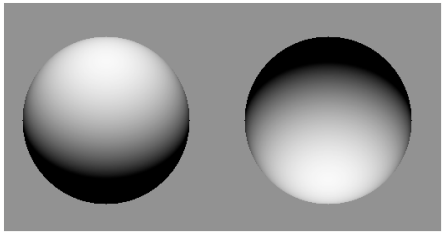
Do the apricots look spherical?

Interpreting shading









Notice that the interpretation of the data is ambiguous.

The left image can be a convex with light from above, or concave with light from below.

The right image can be convex with light from below, or concave with light from above.

On average, we resolve the ambiguity by assuming that the light comes from above (prior).