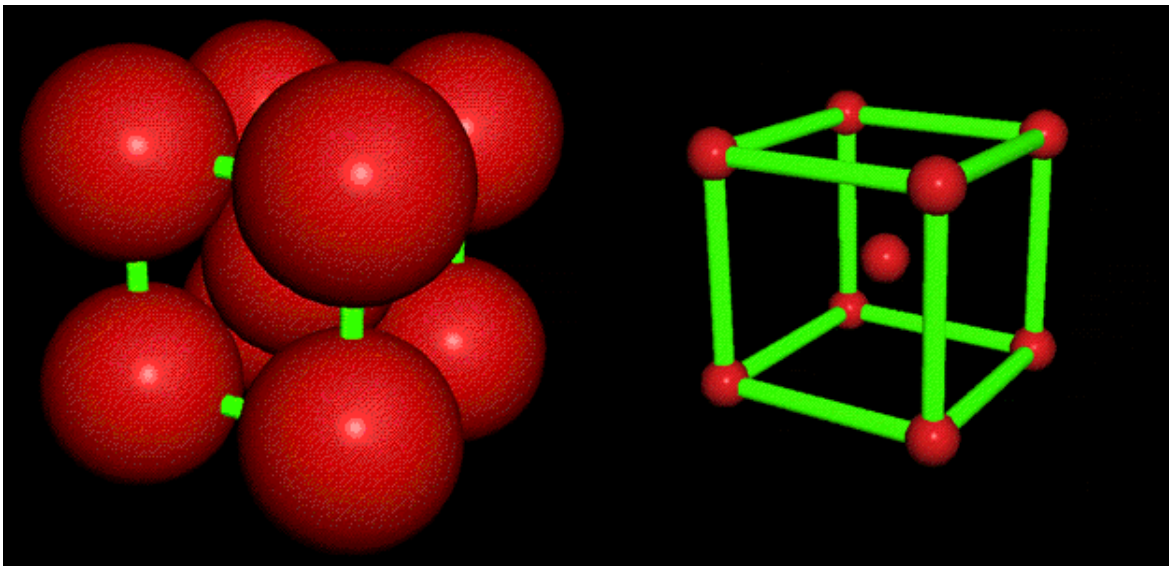

Figure 1. Two frames from an animation of the BCC unit cell, in which the atoms shrink as the view rotates to show the essential geometry as well as the space-filling atom contacts.

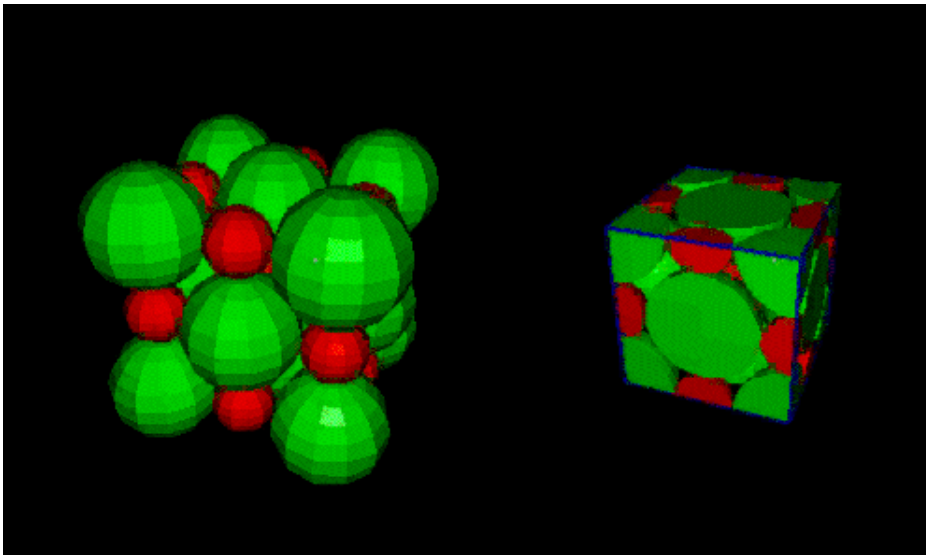

Figure 2. The sodium-chloride unit cell, with different colors for Na and Cl atoms, each in the correct size and filling space, and cut away to show the portions of atoms lying within a single unit cell (one frame from a rotating animation).

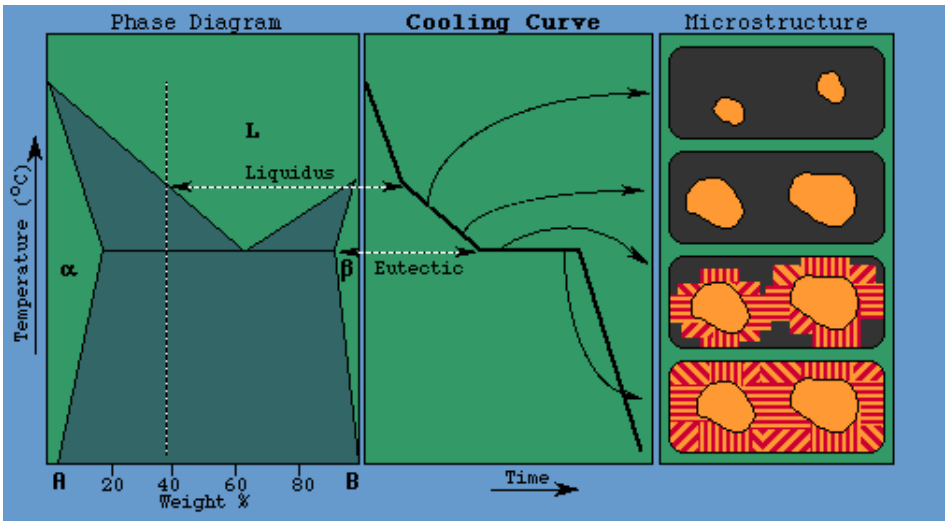

Figure 3. One frame from an animation of cooling a two-phase material with a Eutectic. The side-by-side graphics show simultaneously the phase diagram, the cooling curve, and the evolving microstructure.

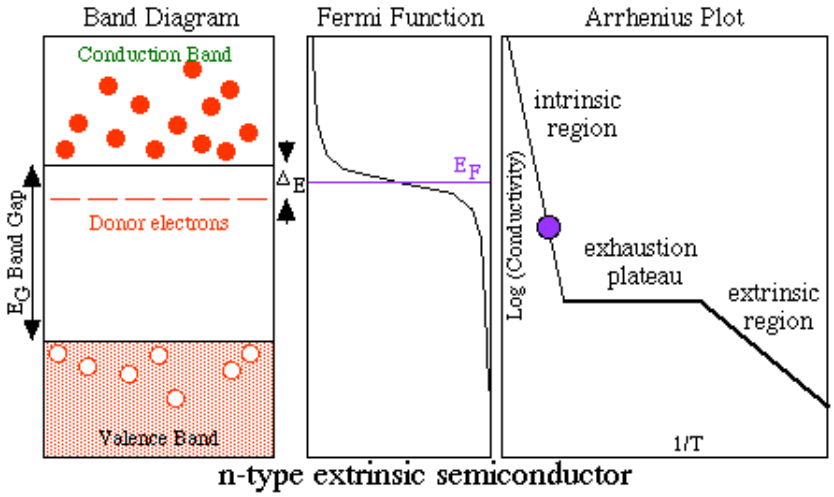

Figure 4. One frame from an animation of the effect of temperature on conductivity of an extrinsic semiconductor, relating the changes in the distibution of electrons across the band gap to the Fermi function, and to an Arrhenius plot of conductivity.

Figure 5. A student project experiment using peanuts in frozen Jello to demonstrate the effect of particle size and density on impact properties of composites (measured by dropping weights from different heights to produce failure).

Figure 6. Using a plate of cooked spaghetti to demonstrate how the alignment of polymer molecules with deformation strengthens the polymer.

Figure 7. Breaking uncooked spaghetti noodles provides a virtual laboratory experiment to demonstrate Weibull modulus of brittle materials.

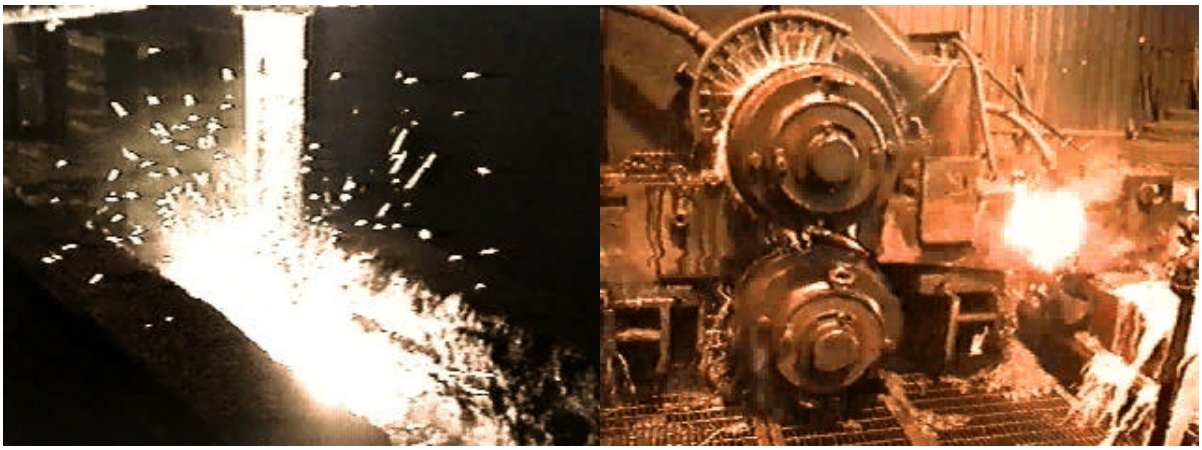

Figure 8. A field trip to a steel mill provides a total of 15 minutes of digital video covering all aspects of steelmaking (shown here are pouring the molten metal into a continuous casting machine, and rolling of the billet).

Figure 9. Digital video showing Nell Cole, an important person in the history of pottery making in North Carolina, throwing a pot.

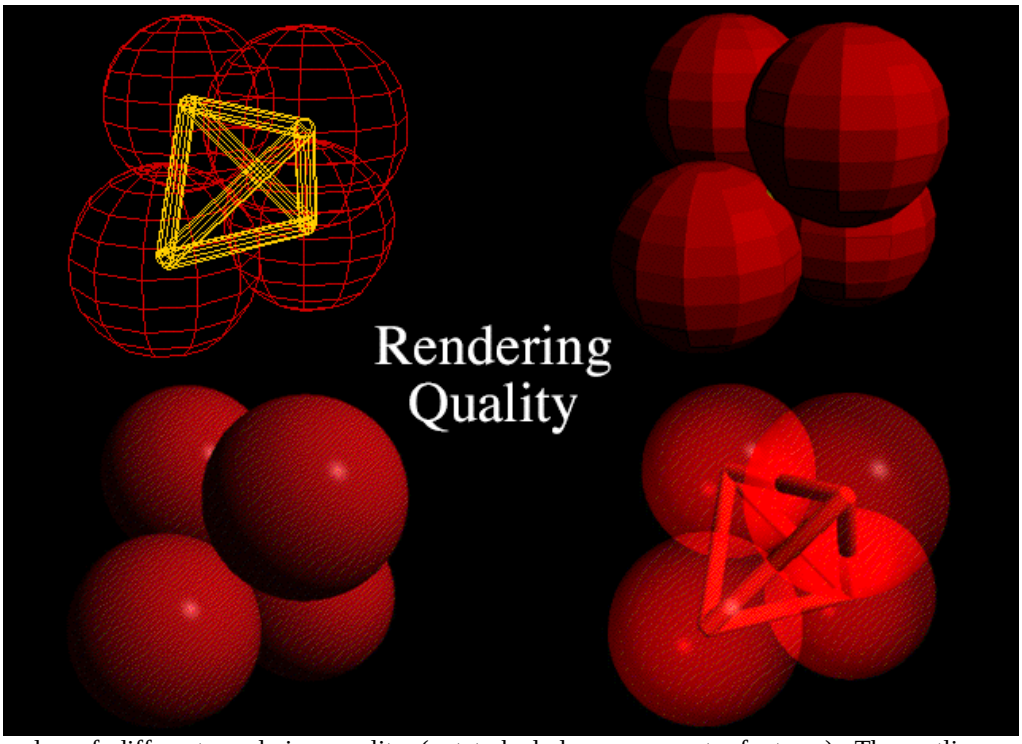

Figure 10. Examples of different rendering quality (a tetrahedral arrangement of atoms). The outlines-only view is not acceptable to any students. The shaded polyhedra view is acceptable to white males, while the smoothly rendered spheres are preferred by minority students. Selective use of transparency is useful to show internal details, but only as a supplement to solid exterior views as the addition of internal surfaces and structure is confusing to a large fraction of students.

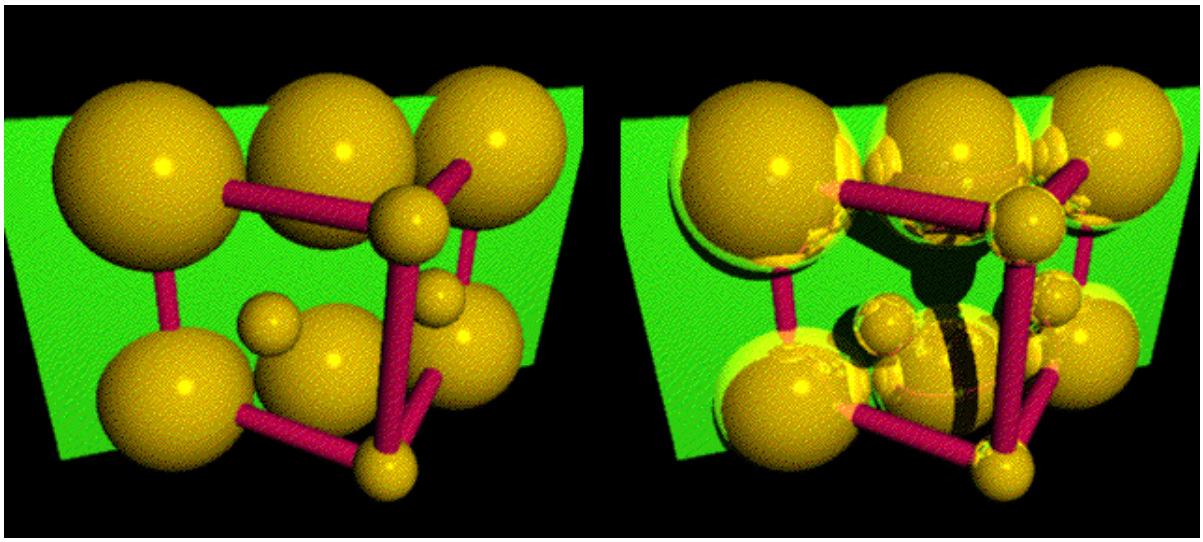

Figure 11. Rendering this plane through a unit cell with reflections and shadows is preferred to flat shading as “more realistic” by black minority students.

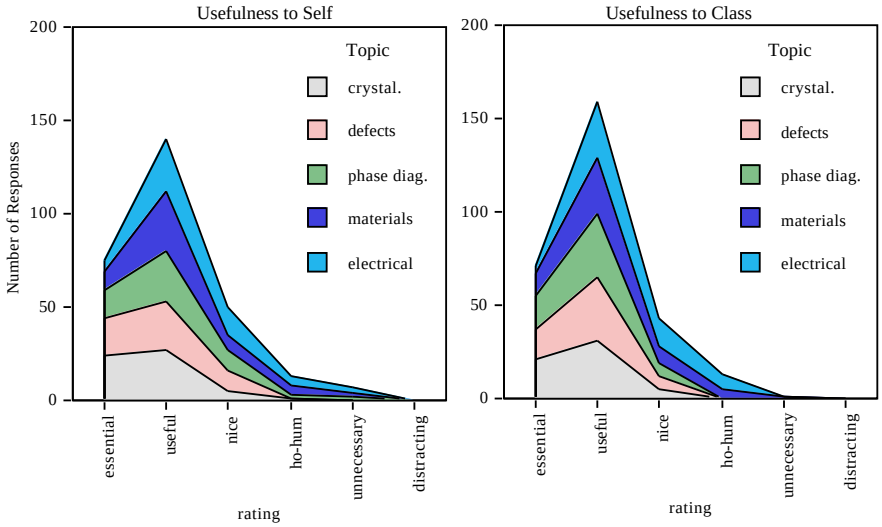

Figure 12. Representative student responses to questionnaires ranking the utility to themselves and their estimates of the utility to the class as a whole, for multimedia modules addressing several topics within the course syllabus.