Model: Ray Optics

Act 8.7.4 Follow-up of DLM 09 FNTs 1, 2, 3 (~60 min)

Learning Goals:

(see DLM09 for learning goals)

Act 8.7.5 Amateur Optometry (~60 min)

Learning Goals:

- Understand that corrective lens for people with imperfect vision can understood as creating a virtual image that located within the range where the person can focus elearly
- Understand optometry on a simple level, exploring how certain basic corrective lens types (convergent or divergent) can remedy nearsightedness or farsightedness, and how this is related to the optical power of the corrective lens.

Act 9.1.1 Electric Charges and Electric Forces (~20 min)

Learning Goals:

- Two dissimilar neutral materials can acquire opposite charges by rubbing together.
- Electrostatic forces are exerted on net neutral objects (conductors and insulators) via charge induction.

Reading Assignment:

Begin reading Unit 9 on Fields and Potentials in the Course Notes

Model: Ray Optics

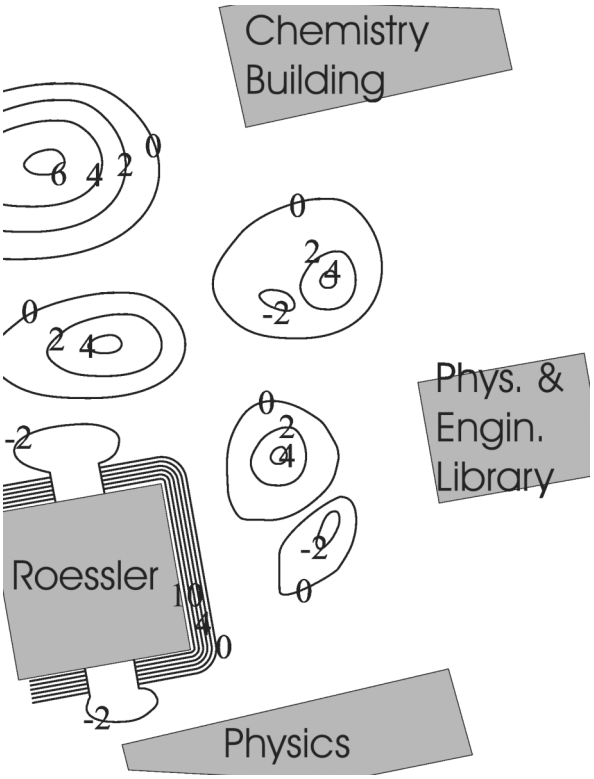
(Reflection/Solidification) Review the Activity sheets from DLM08 through DLM10, which cover optics. If you have any questions about this material, it is a good idea to address them now in office hours. Starting with the next DLM, we are going to change gears and explore the physics of electricity and magnetism.

(Solidification) If you want to improve your ray tracing skills, you can try making ray traces of the multiple-lens scenarios. One thing to keep in mind as you do this: The principle rays that you draw for the first lens will not be the principle rays of the second lens.

Model: Fields and Forces

In physics, a "field" refers to a quantity that has a value for <u>every</u> point in space.

The picture to the right shows a topographic map (a picture of a 2-dimensional region of space) of the region of the Physical Sciences section of campus. The following questions concern fields defined over this 2-dimensional space.



1) (Introduction) What kinds of physical quantities are fields? Of the following physical quantities decide which are <u>fields</u> in the 2-dimensional space of the map (i.e. which quantity has a value at **every** point on the map). You may remember that vectors are physical quantities that have a direction and scalars are physical quantities that are just numbers. For each field you name, is it a vector field or a scalar field?

a) Temperature at ground level.

b) Wind velocity at 100 feet above the ground.

c) Gravitational force on Roessler Hall.

d) Height of the Physics building.

e) Height (above sea level) of the ground.

f) Slope of the surface of the earth.