What is the physical principle that most thermometers operate on?

1. Celsius scale
2. Kelvin scale
3. Thermal expansion
4. Electrical resistance

What is the approximate “relaxation time” of a mercury thermometer?

1. 10 microseconds
2. 10 ms
3. 10 s
4. 1000 s

For what set of conditions described below would you expect the ideal gas law to be the most accurate?

1. Low volume
2. Low density
3. Low mass
4. Low temperature

How many degrees of freedom does an atom in a simple crystalline solid have?

1. 3
2. 6
3. 8
4. 12

That’s the reading quiz finished. Was it…

1. Way too hard.
2. Tough, but fair.
3. OK
4. Pretty easy.
Schroeder 1.4: Does it ever make sense to say that one object is twice as hot as another?

1. Yes.
2. No.

Schroeder 1.6:
Give an example to illustrate why you cannot accurately judge the temperature of an object by how hot or cold it feels to the touch.

Schroeder 1.11:
Rooms A and B are the same size, and are connected by an open door. Room A, however, is warmer. Which room contains the greater mass of air?

Schroeder 1.19:
Suppose you have a gas containing hydrogen molecules and oxygen molecules, in thermal equilibrium. Which molecules are moving faster, on average?

By what factor?

Schroeder 1.21:
During a hail storm, hailstones with an average mass of 2 g and a speed of 15 m/s strike a window pane at an angle of 45 degrees. The area of the window is 0.5 m$^2$ and the hail stones hit at a rate of 30 per second.

What is the average pressure they exert on the window?

How does this compare with atmospheric pressure?

Schroeder 1.23:
Calculate the total thermal energy in a litre of helium at room temperature and atmospheric pressure.

Repeat the calculation for a litre of air.
Uranium has two common isotopes, with atomic masses of 238 and 235. One way to separate these isotopes is to combine the uranium with fluorine to make hexafluoride gas, UF₆, then exploit the difference in average thermal speeds of the molecules containing the different isotopes. Calculate the rms speed of each type of molecule at 25 degrees C and compare them.

(Atomic mass of fluorine: 19)