



Seeing Is Believing!



Topic: Maxwell-Boltzmann statistics, Kinetic theory of gases

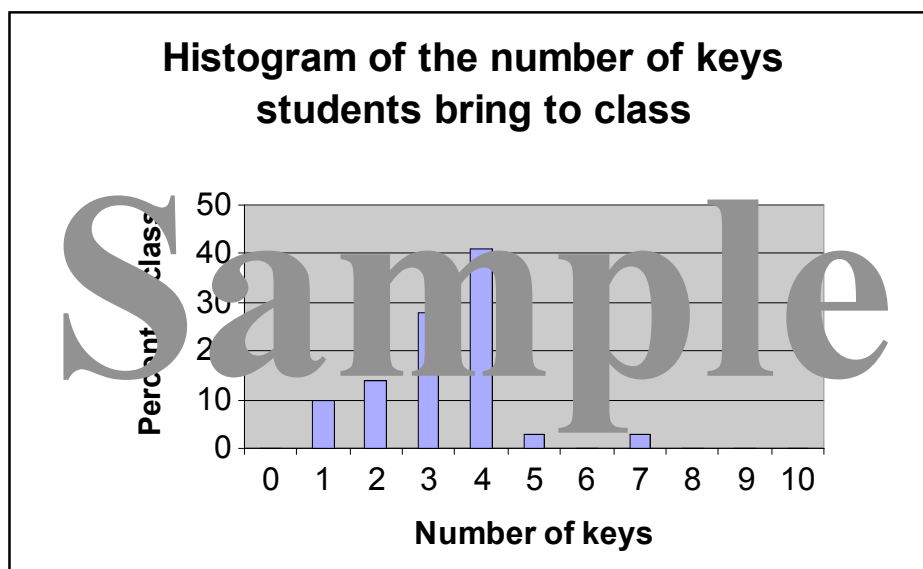
Courses: General Chemistry, Physical Chemistry

Text References:

Procedure: Demonstration time is < 5 minutes.

1. Ask students to take out their keys.
2. By show of hands, determine how many students have one key. Two keys? Three keys? ...
3. Convert data into a histogram.

Observation: The histogram will not be Gaussian.



Explanation: This demonstration introduces the notion of non-Gaussian distributions to the students. Unlike in a Gaussian distribution, the average value is not the same as the peak maximum (the mode). Another way to say this is that the average value is not equal to the most probable value. (In the example given above, the average value is three keys, but the most probable number of keys is four.) Real-life examples of non-Gaussian distributions can be found in chemical thermodynamics. An example is the kinetic theory of gases where the average speed of a molecule is not equal to the most probable speed of a molecule.