

Learning Strategies for Students with Limited English Proficiency

1. Point out new vocabulary words in context and practice using the words as much as possible throughout the activity.

Slit	Distinct	Corresponding	Equivalent	Model
Transition	Detector	Pictorial	Broadcast	Unit
Campfire	Revolutionary	Crucial	Least	Comprise

2. The quantization of energy levels is a difficult concept for students to accept. It helps students understand the spectroscopy and energy-level concepts to dramatize the steps and focus the discussion on energy. A dramatization can be used to explain the hydrogen atom levels. Because a hydrogen atom has only one electron, only one student is needed to represent the electron. Select the one student who will act as the electron that will move from the ground level to higher energy levels. This electron-student should begin by sitting on the floor. Have several different levels available to the student, such as a chair, a table, and a countertop. Add some energy to the atom. This act can be represented by pretending to zap the atom. Make sure students note that the atom now has more energy than it did before. In the process of absorbing this energy, the electron makes a transition to an excited state. The electron-student should jump up to a higher energy level and sit on one of the higher energy levels. Ask students to tell you which transition represents the greatest gain of energy and the least gain of energy. Give the electron-student a ball or other soft object. This represents the additional energy that the electron now has. If you have several different-sized soft objects, the sizes can represent the amounts of energy of the light emitted by the atom when the electron-student makes transitions downward in energy level. The electron relaxes down to a lower energy state. In the process it emits (gives away) the extra energy it had as light energy. The electron-student should jump down to a lower level, throwing the ball to the audience while doing so. In order to assess students' understanding, ask them, "Why can the atom not emit light (such as yellow) of an energy intermediate in the quantized spectrum?" The answer is that there are no energy-level transitions in this atom that correspond to the intermediate colors.