Name Date

Worksheet 3.2: Hydrogen  
emission spectrum

In a hydrogen emission spectrum, there are separate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ representing radiations of different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The presence of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ spectrum rather than a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ spectrum provides evidence that electrons can only possess certain allowed   
energies in an atom.

The emission spectrum is produced when an electron is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by external energy and moves from its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ state to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy level. When the electron returns to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy level, a photon of a particular energy is released. The energy   
of the light is equal to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between the two energy levels.

There are different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of lines in the hydrogen emission spectrum. The Lyman   
series in the UV region is produced when the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electron returns to the   
*n* = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ level, where *n* represents the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy level. The Balmer series in the visible region is produced when the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electron returns to  
the *n* = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ level.

The lines in the emission spectrum get \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at higher energy; this means   
the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in an atom get closer at higher \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.