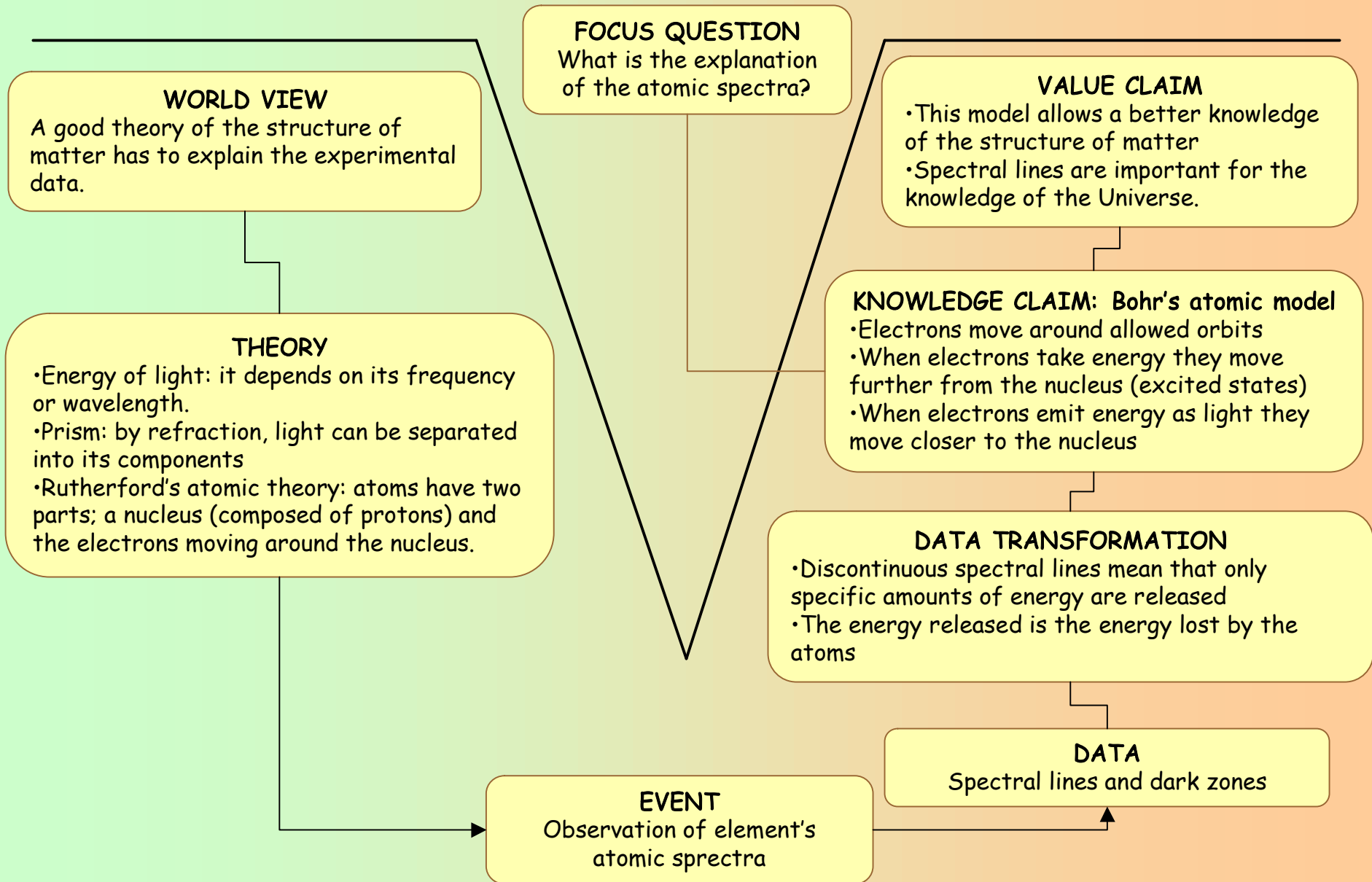


Bohr's Atomic Model



Bohr's Atomic Model

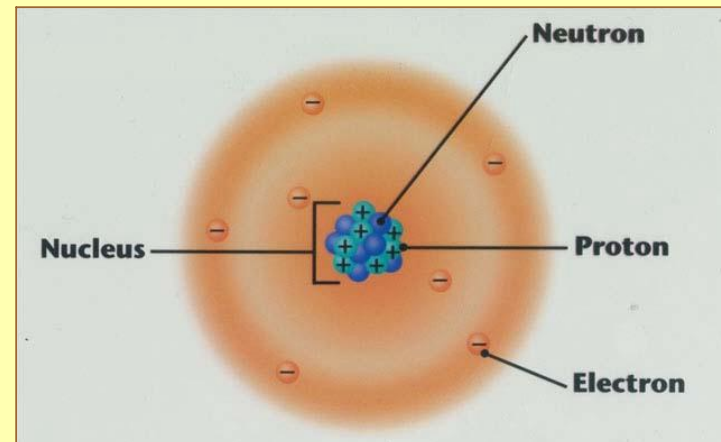
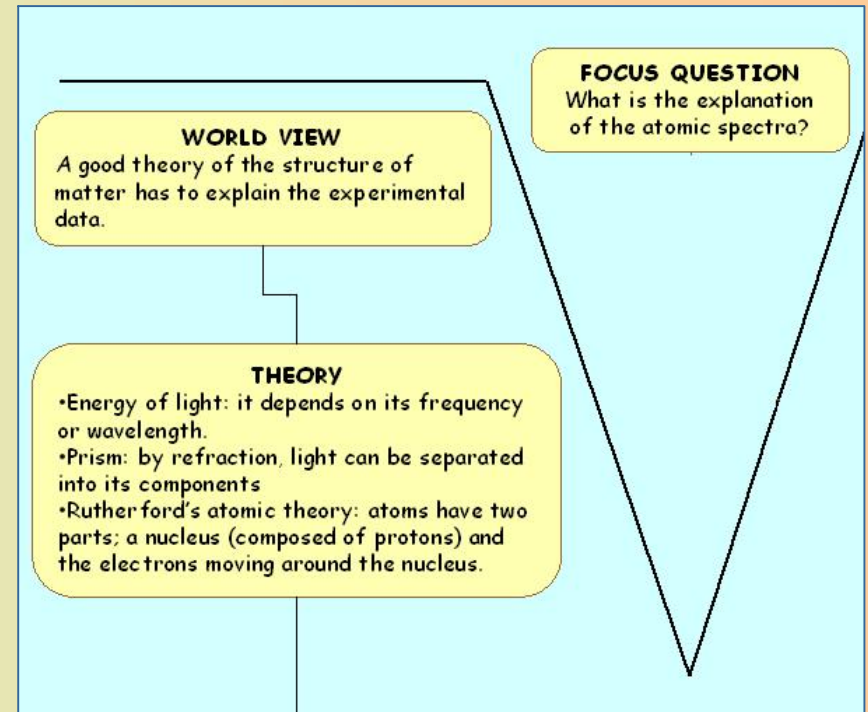
World View

Physicists could not explain the light emitted when an element is vaporized and then thermally or electrically excited.

A new atomic model is needed: an atomic model that explains this new observation.

Theory: Rutherford's atomic model

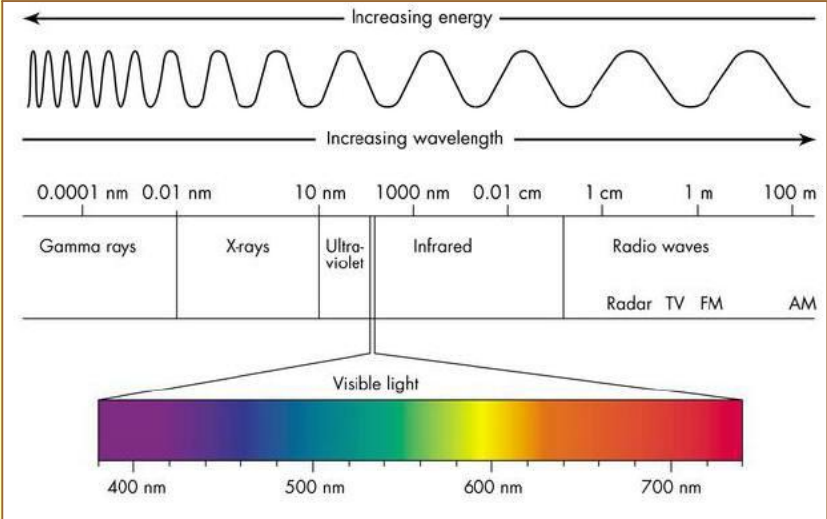
Atoms are composed of a nucleus, that contains all the positive charge and essentially all the mass of the atom. The electrons move around the nucleus.



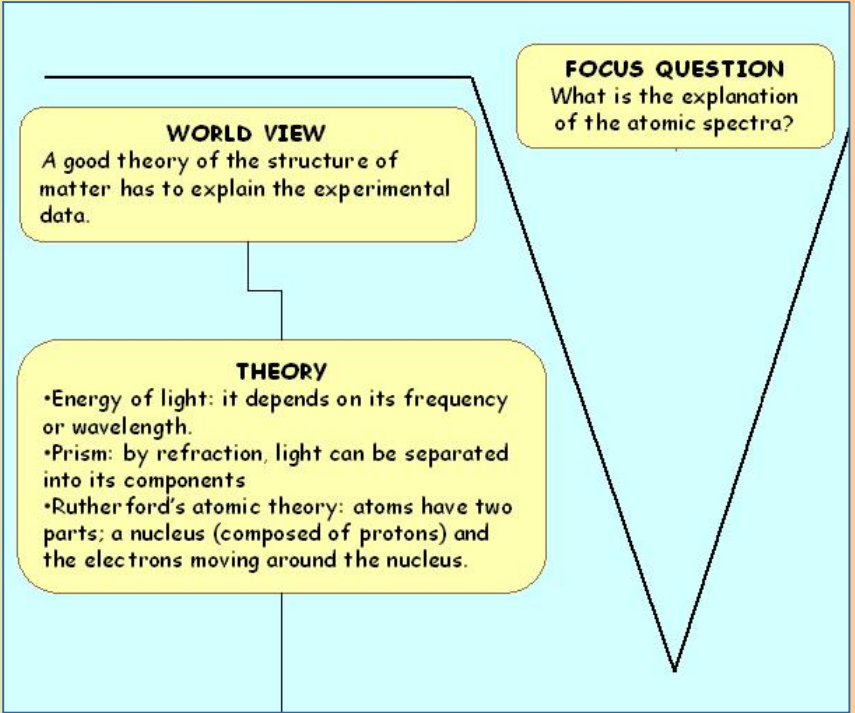
Bohr's Atomic Model

Theory: energy of light

The energy of a beam depends on the wavelength: shorter waves are more energetic.



At the same time, short waves have a higher frequency.



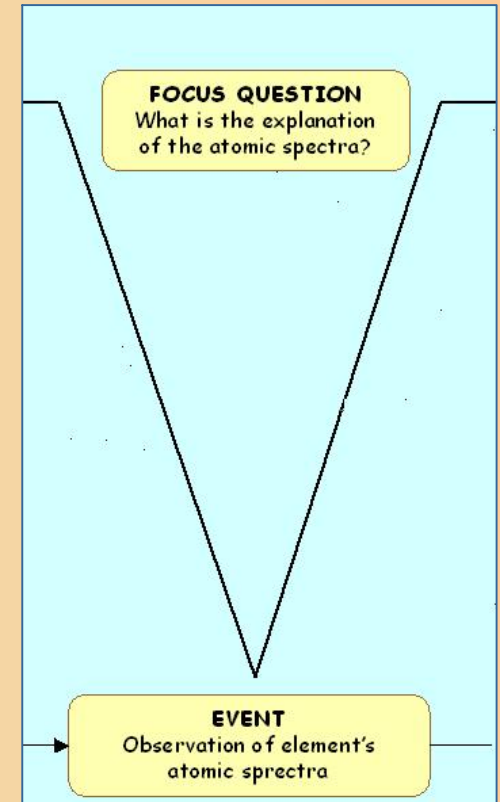
Theory: The prism
Light can be decomposed into its components through a prism



Bohr's Atomic Model

Event: observation of element's atomic spectra

When an element is vaporized and excited (thermally or electrically) emits a light that can be divided into its components and observed through a spectrophotometer.

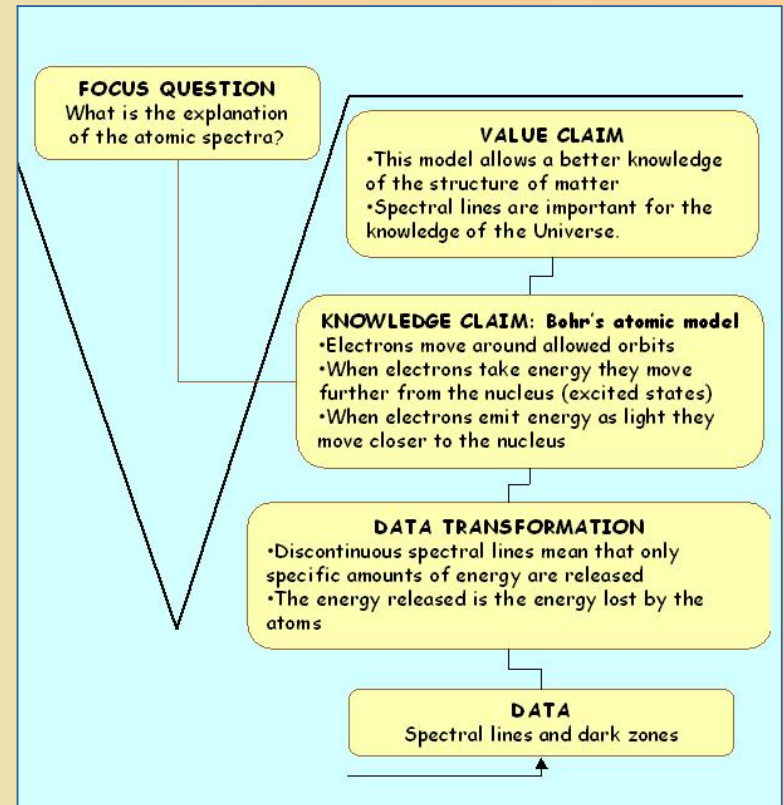
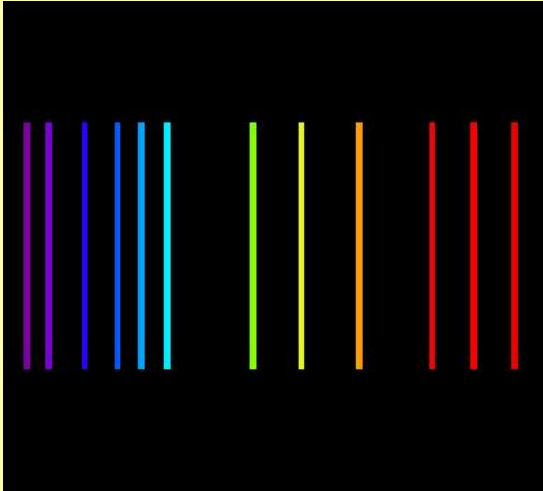


Bohr's Atomic Model

Data: spectral lines

What is observed is a **line spectrum**, a series of fine lines of individual colors separated by black spaces.

Each element has its own characteristic spectral lines.

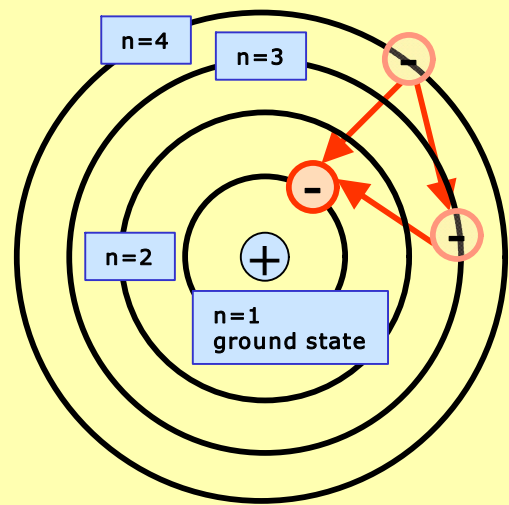


Bohr's Atomic Model

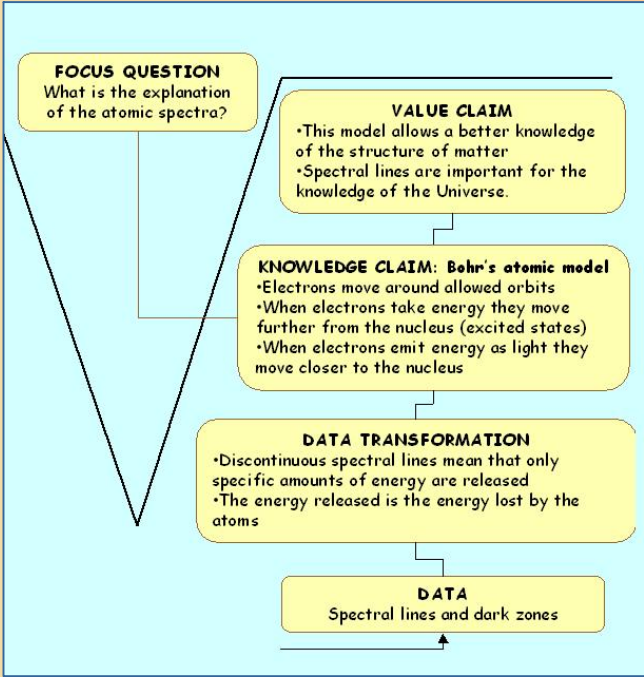
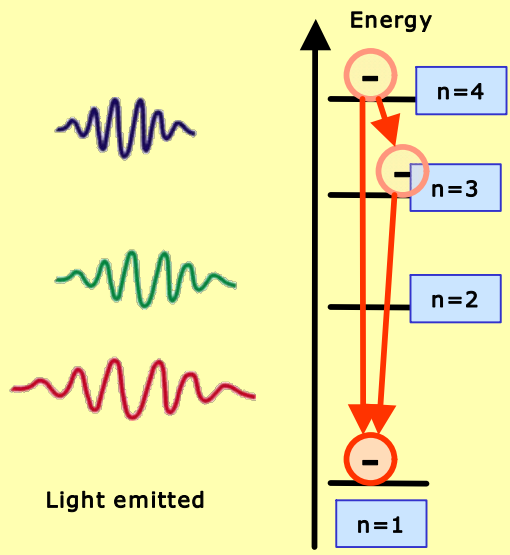
Data transformation: reasons for spectral lines

Provided that every element has its own specific atomic spectrum, it means that atomic spectra is connected to the structure of atoms.

Bohr related the emission of energy to jumps of electrons between allowed orbits.



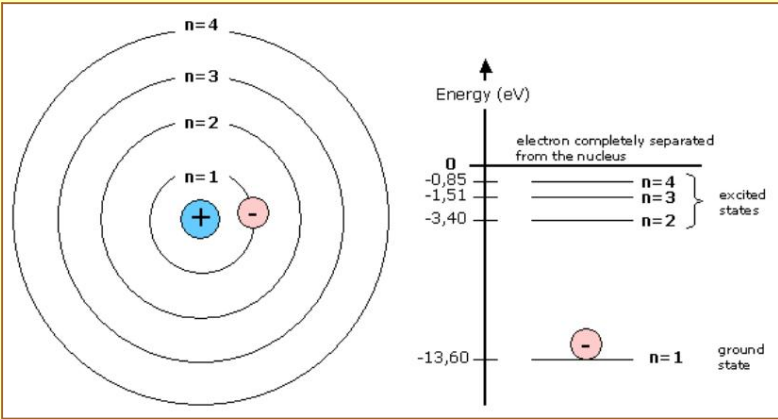
The electron returns to its ground state and releases energy as light photons



Bohr's Atomic Model

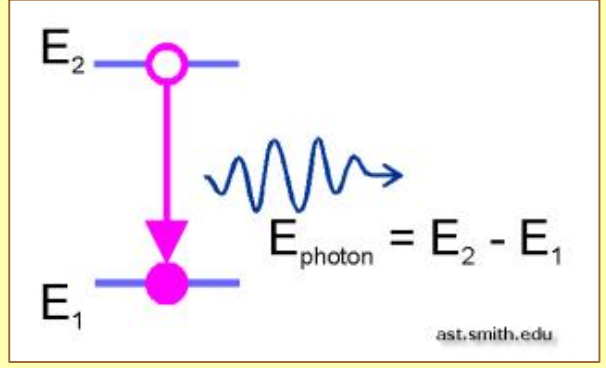
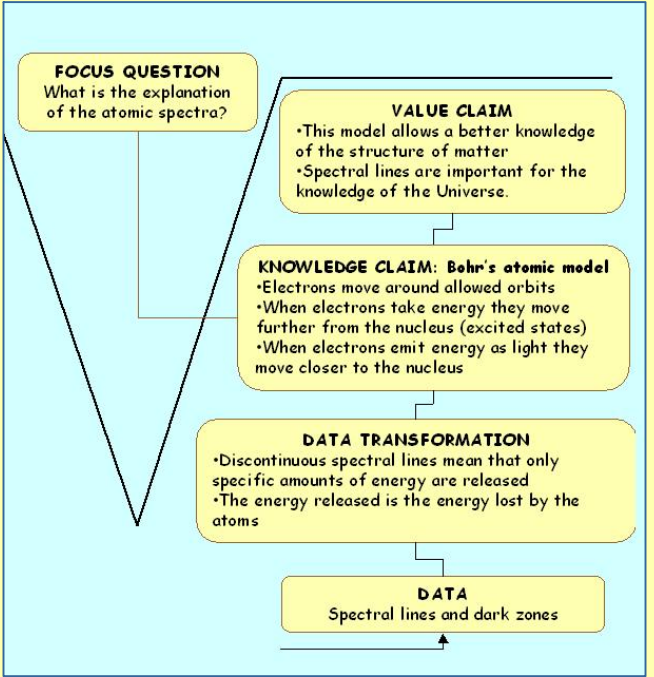
Knowledge Claim: Bohr's Atomic Theory

• Each atom has only certain orbits. Each orbit has a specific energy value (level).



• The atom does not radiate energy while the electron is placed in one of the circular orbits.

• When the electron moves to another orbit, it absorbs (when it goes to an outer orbital) or emits (when it goes to an inner orbital) energy as a photon (light).



Bohr's Atomic Model

Value Claim

- Enhanced knowledge of the structure of matter
- Application of spectral lines in several scientific fields: study of the Universe...

