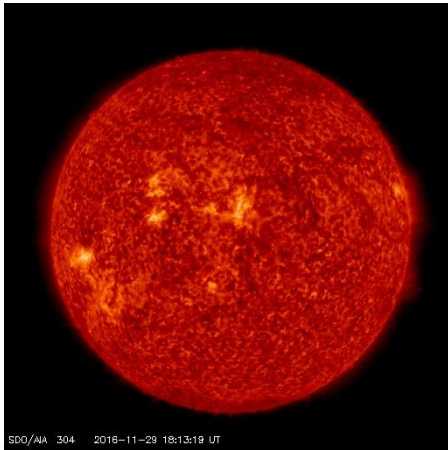
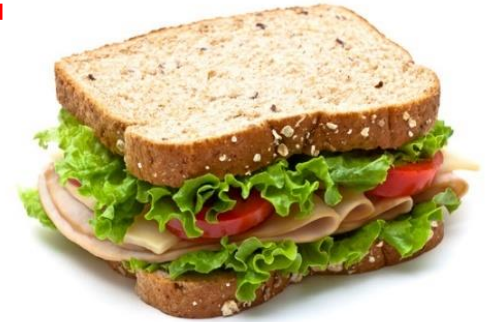
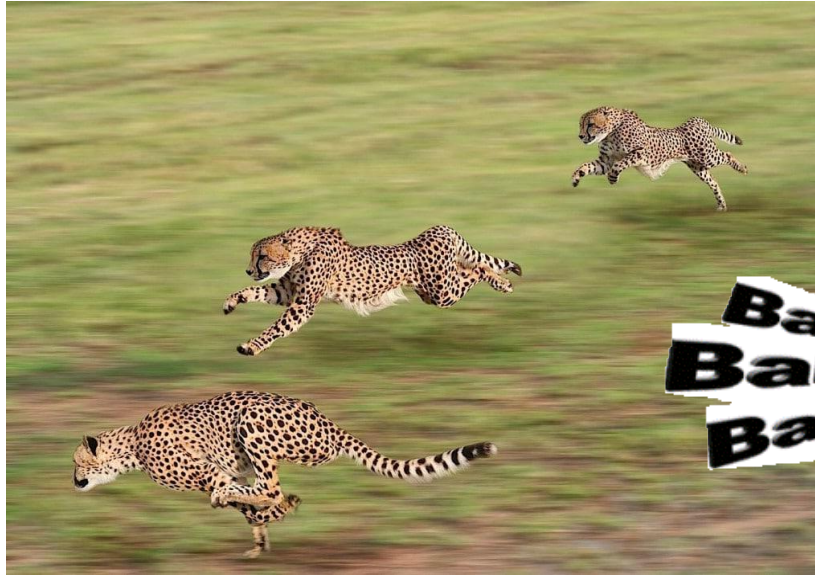
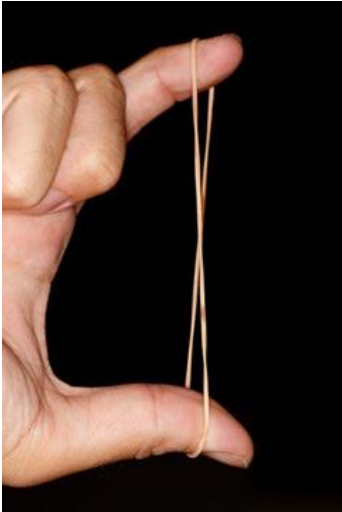


# What type of energy?

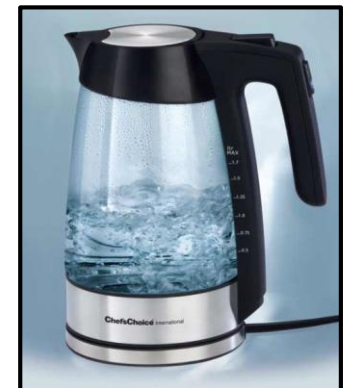
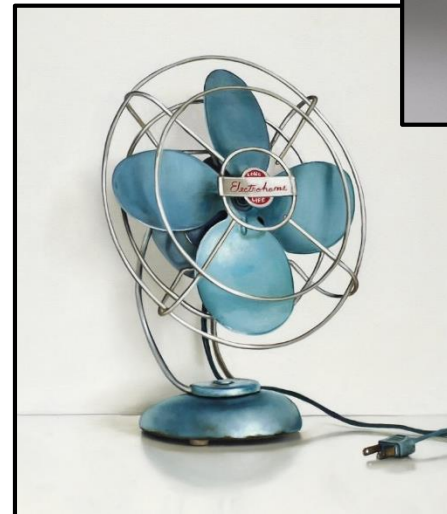


# Law of Conservation of Energy

Total energy of an isolated system is conserved over time: energy can be neither created nor destroyed, but can be transferred, or converted from one form or place to another.

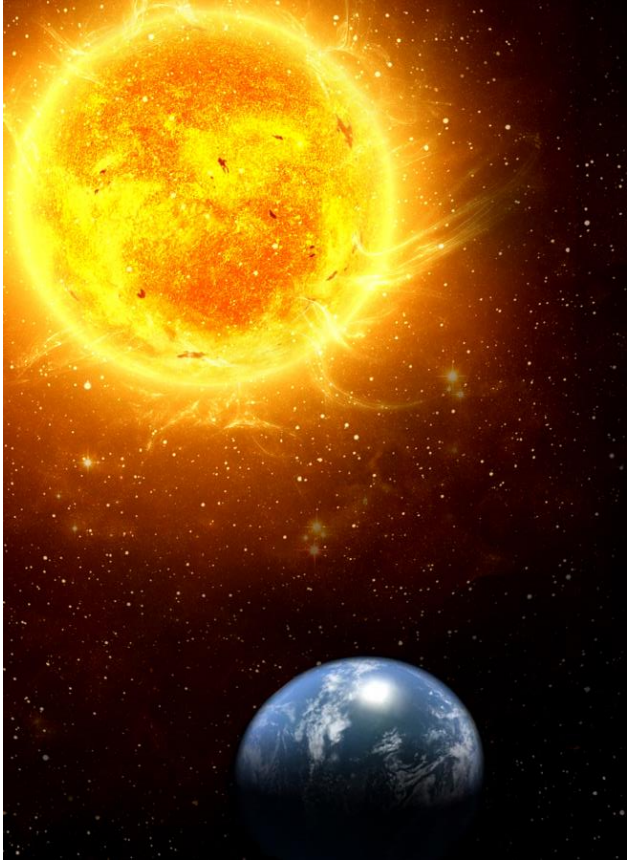


...and is converted into...



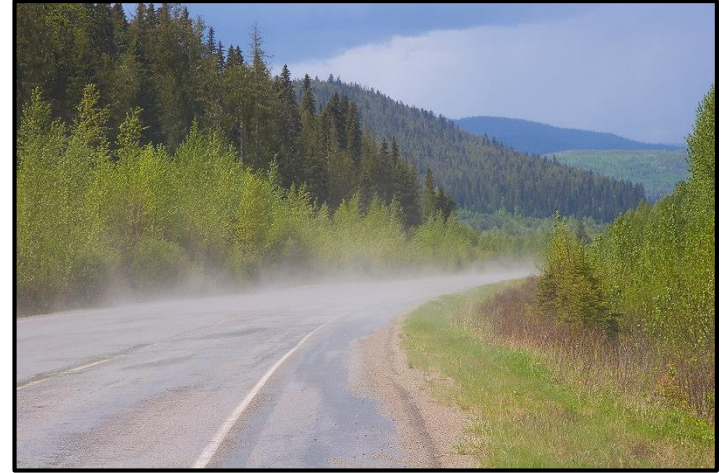
**Electrical energy** is transported to your house through power lines...

# Energy Conversion



**Light** from the Sun is reaching the Earth...

...and is converted into...



# Energy Transfer between Objects



Identify **all types of energy** as well as **objects** involved.

# US Electric Energy Generation



Fossil fuel

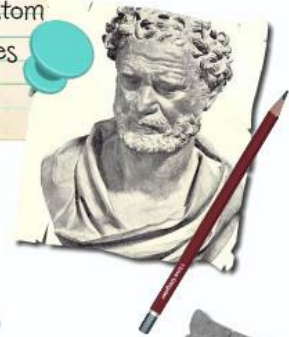
+



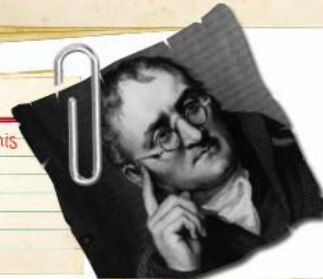
# What is Atom?



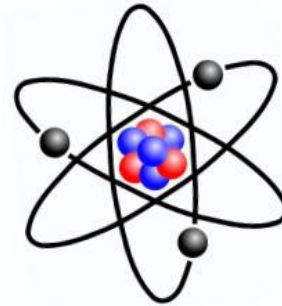
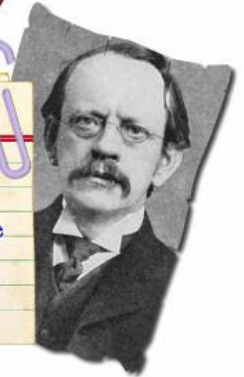
Democritus said that all atoms are small, hard particles.



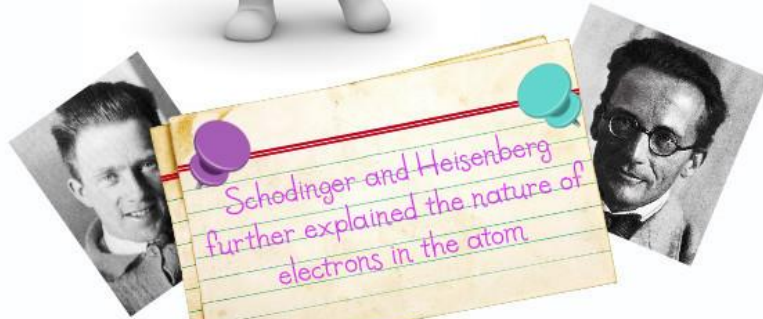
John Dalton developed his atomic theory from observations of many experiments.



J.J. Thomson discovered that there are small particles inside the atom.



Schrodinger and Heisenberg further explained the nature of electrons in the atom.



Rutherford decided to test Thomson's theory by an experiment to study the parts of an atom.

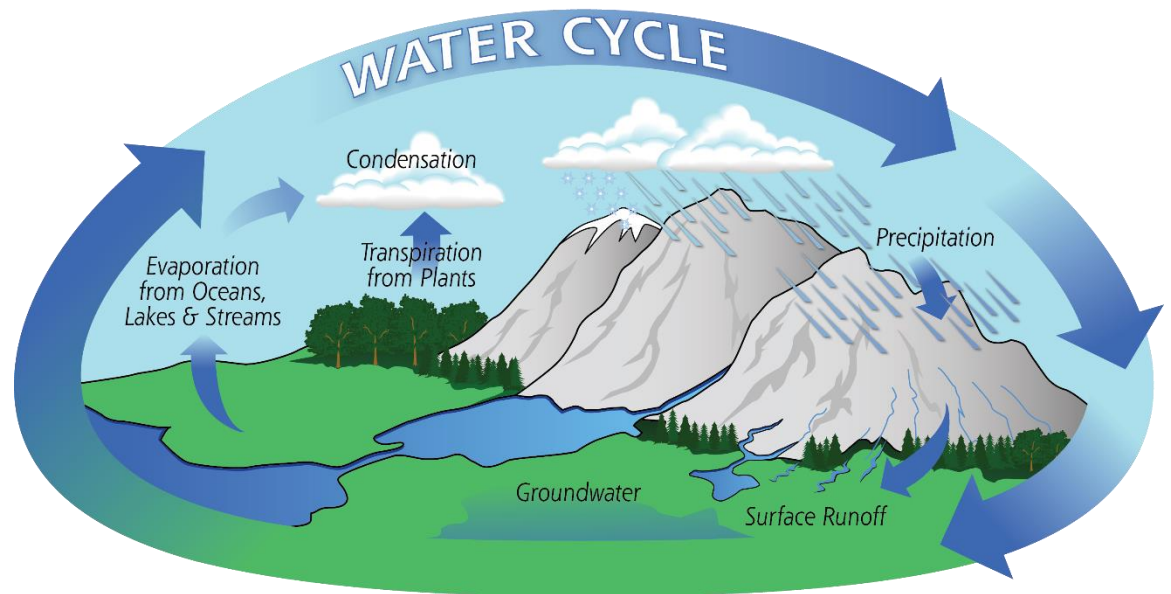


Bohr's results led him to propose that electrons move around nucleus in certain paths or energy levels.



# What is a Model?

In Science, a model is a physical, mathematical, or conceptual (abstract) representation of a real phenomenon that is difficult to observe directly – that is, a *convenient substitute*.

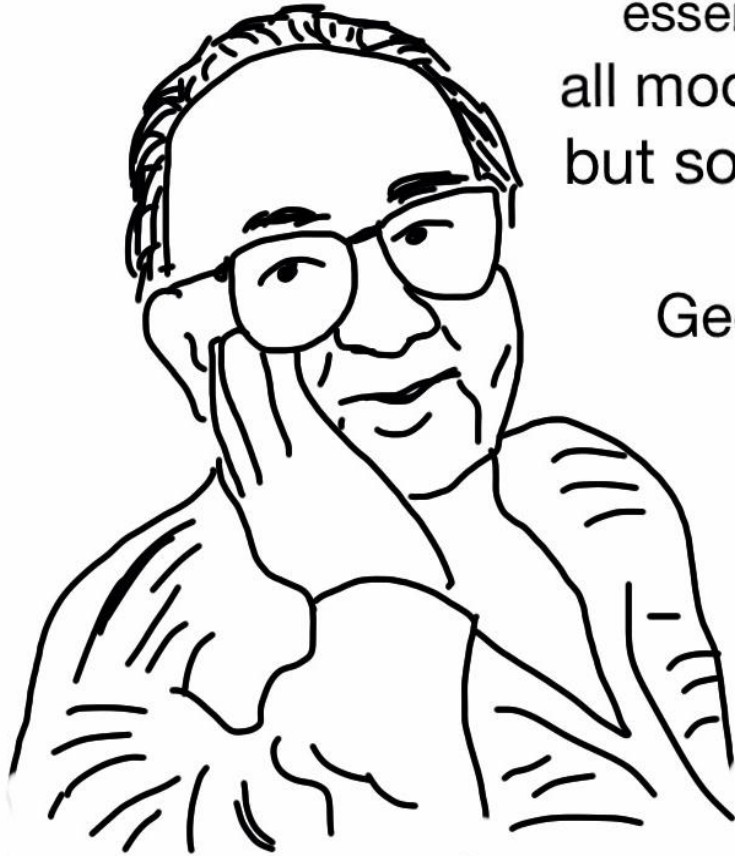


Scientific **models** are used in a variety of scientific disciplines to explain and predict the behavior of real objects or systems.

# Model is Never Perfect

essentially,  
all models are wrong,  
but some are useful

George E. P. Box



*(one of the most  
influential  
statisticians of  
the 20<sup>th</sup> century)*



Scientific models  
are **approximations**  
of the objects and  
systems that they  
represent!

Scientists are constantly working to **improve and refine** models.