

Name: _____

Period: _____

Nuclear Power

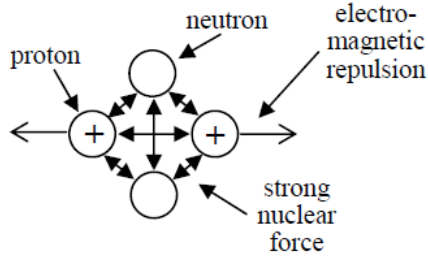
Atoms can be changed

Democritus believed there to be a smallest, indivisible particle: atomos. In the early 20th century scientists learned that the atom is indeed divisible and even fusible.

All Atoms are not Stable

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Protons and neutrons are known as **nucleons** because they are in the nucleus.



Neutrons add **strong nuclear force** without repelling the protons. Since the strong nuclear force only works over short distances eventually there are too many protons and the repulsion wins. Over 83 protons and the nucleus will undergo **radioactive decay**.

Isotope Notation

Mass #: protons + neutrons

14 C

6

Atomic #: protons

Fission versus Fusion



Nuclear power plants use fission.

Fission

There are two types of nuclear reactions.

The sun uses fusion and is the source of all power on earth.



Fusion

Large atoms are split apart. Uranium is split into smaller atoms.

Nuclear Process

Small atoms are fused together. Two hydrogen atoms are fused into a helium atom.

1 lb completely fissioned Uranium = 6,000 barrels of oil = 1,000 tons high-quality coal

Energy Produced

1 km³ of sea water = more energy than all known fossil fuels in the world.



Toxic radioactive waste that takes billions of years of decay to become safe.

Waste Products

Perfectly safe Helium. We could make balloons.



The real winner: nuclear fusion. So why don't we use it? Fusion occurs in the sun. It takes millions of degrees to even start fusion. So far we can't control it. But scientists are working on it.

As a future voter — demand money for fusion research!

What are your thoughts on Nuclear Energy? Should we use it? Why or why not.

Power Generation

WATCH THESE VIDEOS AND FOLLOW THE INSTRUCTIONS BELOW:

Draw, label and explain the basic components of a fossil fuel power plant.

http://www.youtube.com/watch?v=4SHN5zCM_uM

Draw, label and explain the basic components of a nuclear power plant in the space below

http://www.youtube.com/watch?v=1SZcMn_oQ-I

Draw, label and explain the basic components of a Hydroelectric dam.

<http://www.youtube.com/watch?v=cOqcivR1eQ4>