**Nuclear Energy Guided Notes**

**Vocab:**

Nuclear Fission:

Turbine: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that has a part with blades that are caused to spin by pressure from

\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Generator: a machine \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**The Nuclear Fuel Cycle:**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Process Uranium to make fuel

**Effects of Radiation:**

* Genetic damage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Genetic defects can become apparent in the next generation
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: burns, miscarriages and cancer

**Radioactive Waste:**

* Above Ground Disposal
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + - Cheap
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Use a geologic formation and excavate a tunnel to dispose of high level radioactive waste.

**Nuclear Meltdown:**

* Nuclear accident in which the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fails.
* Nuclear fuel becomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that breaches the reactor and contaminates the outside environment with radioactivity.

**Advantages of Nuclear Energy:**

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Low environmental impacts (without accidents)
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Disadvantages of Nuclear Energy:**

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Low net energy yield
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. No acceptable solution for long-term storage of waste

**Will nuclear fission save us?**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* No risk of meltdown or large radioactivity release
* Still in research after 50 years and $34 billion

**Yucca Mountain**

By Stephanie Kishi

5/19/14

One of the hottest subjects in Nevada is whether the federal government will go through with long-time plans to build a repository *(a place where things are deposited or stored)* for radioactive nuclear waste at Yucca, which is about 90 miles northwest of Las Vegas.

If Senate Majority Leader Harry Reid, D-Nev., has anything to say about it, it won't be built. Reid, who has slowed down and blocked the project was able to slash more than $100 million out of the budget for the Yucca Mountain repository project before the end of 2007.

How did Nevada, which has no nuclear power plants of its own, come to be viewed as the spot to store all spent radioactive waste from the country's 100-plus nuclear power plants?

The Department of Energy has had its eye on Yucca since 1978.That's when the DOE looked at a 1957 recommendation by the National Academy of Sciences that found the best way to dispose of nuclear waste was to place it inside rocks deep underground. The Nuclear Waste Policy Act of 1982 established a program that put the DOE *(department of energy)* in charge of finding, building and operating an underground waste repository.

Reid, a long time opponent of Yucca Mountain, became the Senate Majority Leader after Democrats took control of the Senate. And since that time, he has been able to slow down and block the project. Reid has called the project dead.

1. Why do you think Harry Reid wants to block the Yucca Mountain project?

Yucca Mountain is located inside the Nevada Test Site in Nye County, Nevada, and is actually a ridge comprised of volcanic rock. Because of the material that the volcanic rock is made of, some experts believe that it is perfect to hold the waste long enough for it to decay. The exact time it takes for nuclear waste to decay is unknown, but some estimate it can take over 100,000 years.

One concern is that the waste units will inevitably fail and that the waste will slowly seep out into the underground water supply before it can fully decay. Another concern is the mountain's seismic activity. Yucca Mountain does sit on tectonic deformation, but according to the DOE, the activity is so low that it won't affect the repository.

2) Do you believe that all the nuclear waste in the country should be stored in Yucca Mountain? Why or why not?