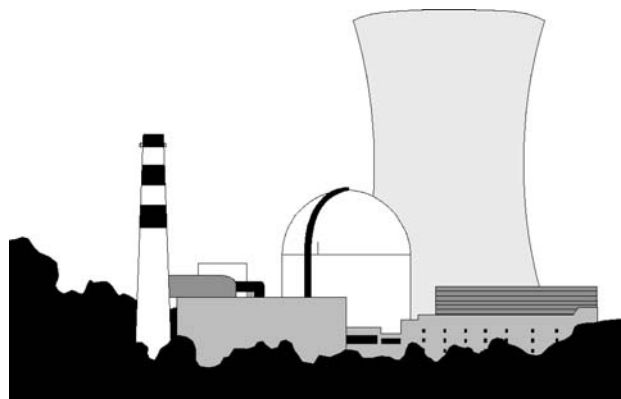


Real-Life Career Activity

Nuclear Engineer

Nuclear engineers design, build, and operate facilities that use nuclear energy, such as nuclear power plants and scientific research facilities. Radioactive materials are used in medicine as well as in nuclear weapons. Doctors treat some types of cancers using nuclear technology. Researchers in nuclear medicine are discovering many new ways to use nuclear energy to diagnose and fight diseases.



Plutonium is a radioactive substance that nuclear power plants use. Nuclear engineers in these plants often have to carefully calculate the number of atoms contained in an amount of plutonium. An engineer can use the formula below to calculate the approximate number of plutonium atoms.

$$n = 2.5 \times 10^{21} \times m$$

In this formula, n is the approximate number of plutonium atoms, and m is the mass of the plutonium in grams.

Suppose a nuclear engineer wants to calculate how many plutonium atoms are in 2 grams of plutonium.

$$n = 2.5 \times 10^{21} \times 2$$

$$n = 5 \times 10^{21}$$

There are 5×10^{21} plutonium atoms in 2 grams.

Solve.

1. Calculate how many plutonium atoms are in 0.5 gram of plutonium.
2. Calculate how many plutonium atoms are in 3 grams of plutonium.
3. If you write 2.5×10^{21} atoms without using scientific notation, how many zeros do you write?