PLAY STEM WITH LM:

Fact OR Fiction ?

LEARNING ABOUT SCIENCE IS FUN!

Discover interesting and surprising facts about nuclear science.

1. Read the front of the card.
2. Before you turn it over, guess if the statement is **FACT** or **FICTION**.
3. Flip the card over for the answer and fun facts!

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Fact OR Fiction?

THE FIRST X-RAY WAS AN ACCIDENTAL DISCOVERY.

Fact OR Fiction?

NUCLEAR ENERGY BATTERIES CAN LAST UP TO 50 YEARS.

FACT

IT IS TRUE

The first X-ray was discovered by accident in 1895 by professor Wilhelm Roentgen when he applied high voltage to a cathode ray tube, which caused it to emit an invisible photon, or electromagnetic ray. He learned that the rays had very short wavelengths that enabled them to pass through human flesh and leave a shadow of the underlying bones on a piece of light-sensitive paper.

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FACT

IT IS TRUE

Nuclear energy battery technology generates electric current from beta particles emitted by radioactive sources. New and upcoming inventions in nuclear energy will produce batteries that can last as long as 5,700 years. This power source is suited for long-term, maintenance-free power, like in medical devices or space vehicles.

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Fact OR Fiction?

OVER TIME, NUCLEAR ENERGY WILL BECOME TOO COSTLY FOR ENERGY PRODUCTION.

Fact OR Fiction?

SHIPPING SPENT NUCLEAR FUEL REQUIRES SPECIALIZED METHODS AND TECHNIQUES.

FICTION

IT IS FALSE

From a cost standpoint, nuclear power can make a lot of energy quite cheaply and will not increase as regularly as with other fuels. It is more reliable than wind power, more consistent than solar power, and produces no greenhouse gas emissions, giving it a big win over fossil fuels.

FACT

IT IS TRUE

The shipping of radioactive material is highly regulated and is done safely by truck, rail, and cargo ships in containers made of thick steel, shielding materials, and special labeling. These design features protect workers, the public, and the environment from radiation exposure.

Fact OR Fiction?

RADIOACTIVE WASTE CAN BE STORED ANYWHERE.

Fact OR Fiction?

NUCLEAR FUEL IS GLOWING GREEN SLIME.

FICTION

IT IS FALSE

The storage of nuclear waste requires careful planning and execution to ensure that it is handled in compliance with stringent safety and environmental regulations. These sites must be geologically suitable to store nuclear waste for thousands of years.

Currently, spent fuel is stored in over 70 locations. These sites are safe and secure. These facilities are designed to isolate the waste from the environment.

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FICTION

IT IS FALSE

While movies and cartoons play off this comedic image, nuclear fuel is not glowing green slime. Fuel is inserted into a reactor as solid uranium pellets stacked inside sealed metal fuel rods. Once used, these pellets are removed as a solid.

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Fact OR Fiction?

NUCLEAR POWER PLANTS REQUIRE MASSIVE AMOUNTS OF URANIUM TO PRODUCE ENERGY.

Fact OR Fiction?

LIVING NEAR A NUCLEAR POWER PLANT IS DANGEROUS.

FICTION

IT IS FALSE

It only takes small amounts of uranium to produce a vast amount of energy. One single uranium pellet the size of a pencil eraser will last up to five years before it needs to be replenished. It would require 6.8 pounds of enriched uranium to produce enough electricity for one person's lifetime.

With new technology rising, many nations are investing research into extracting the unused parts from the spent fuel cell for energy generation so there is even better usability.

FICTION

IT IS FALSE

Living near a power plant is not dangerous. A person continuously standing outside a nuclear plant for one year could be exposed to less radiation than if they had a chest X-ray.

OTHER FACTS:

Nuclear power plants do not produce air pollution or carbon dioxide. The emission from the tower is water vapor (steam).

Power plant containment vessels in the U.S. are designed to withstand extreme weather events and earthquakes.

Fact OR Fiction?

BANANAS ARE RADIOACTIVE.

Fact OR Fiction?

THE U.S. NAVY LAUNCHED THE FIRST NUCLEAR-POWERED SUBMARINE.

FACT

IT IS TRUE

It's true! Bananas are radioactive. In fact, all living things on Earth emit some amount of radiation because there is natural radiation in soil, water, and air.

Bananas are radioactive because they naturally contain potassium. Brazil nuts, lima beans, carrots, and potatoes also make the list. None of these radiation levels are harmful.

BANANA MATH:

Dental X–ray = 50 bananas
Transatlantic flight = 800 bananas
Mammogram = 20,000 bananas

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FACT

IT IS TRUE

In 1951 the U.S. Navy launched the first nuclear-powered sub — the USS Nautilus.

FUN FACT:

On its inaugural voyage, the USS Nautilus was powered by fuel rods produced at Fernald uranium refinery in Ohio. Nuclear power enabled the USS Nautilus to become the first submarine to complete a submerged transit of the North Pole.

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Fact OR Fiction?

RADIOCARBON DATING IS USED TO DETERMINE THE AGE OF OBJECTS AND MATERIALS.

Fact OR Fiction?

THE BIKINI WAS NAMED FOR THE BIKINI ATOLL NUCLEAR TEST SITE.

FACT

IT IS TRUE

Radiocarbon dating is the method scientists utilize to measure levels of carbon-14.

All living things absorb carbon from the atmosphere, including an amount of radioactive carbon-14. When a plant or animal dies, the radioactive carbon-14 that has been accumulated begins to decay. Radiocarbon technology measures the carbon-14 in the remains of living things like bones, plant fibers, wood, and pollen to determine their age.

FACT

IT IS TRUE

The bikini was named after a nuclear testing area. In 1946, four days before the swimwear debuted on the French Riviera, the U.S. military performed nuclear strike tests at Bikini Atoll, inspiring the designer to name his new garment the “bikini” with the intention that the look would explode as the nuclear strikes did.

Fact OR Fiction?

URANIUM USED IN NUCLEAR WEAPONS AND IN POWER PLANTS IS FOUND IN ROCKS.

Fact OR Fiction?

YOU SHOULD NEVER EAT IRRADIATED FOOD BECAUSE IT'S RADIOACTIVE.

FACT

IT IS TRUE

Uranium is a natural metal found in the earth, everywhere from ore deposits, soil, and plants!

Rocks containing uranium ore are dug out of the ground at mining sites. The uranium must be extracted from the ore to be usable in power plants and processed even further, or "enriched," to be used in a weapon.

FICTION

IT IS FALSE

Eating irradiated foods is safe. In fact, this technology, discovered in the 1920s, that exposed foods to ionizing radiation enabled foods to remain in better condition longer and prevented spoiling.

By the late 1950s, the first commercial use of food radiation was utilized to eliminate microorganisms, insects, and germs.

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