Peaceful Uses of Nuclear Energy

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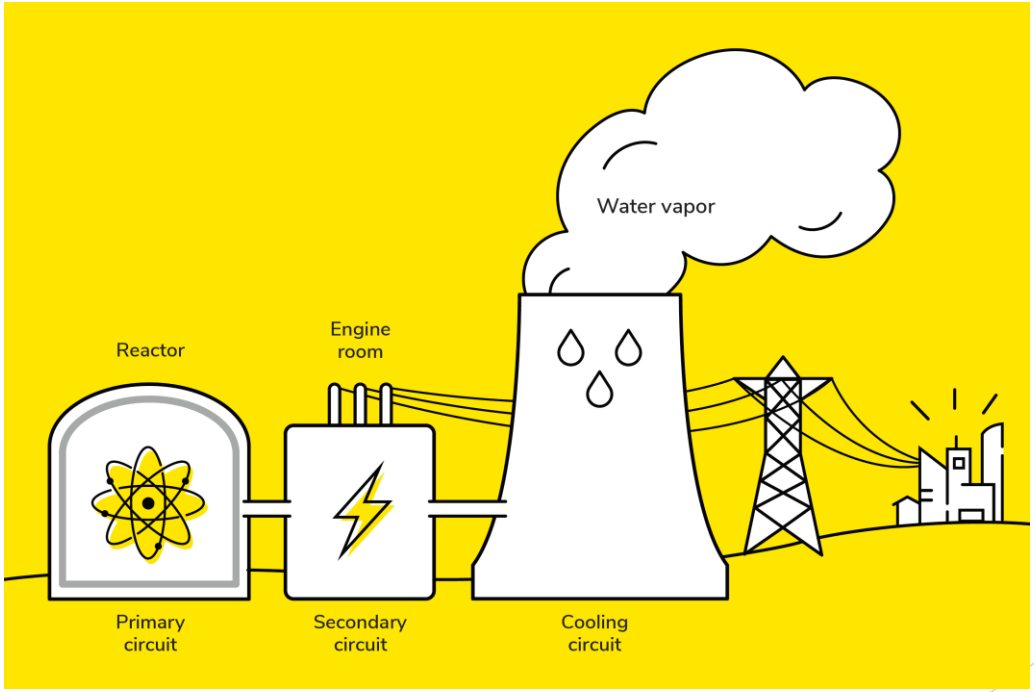
Nuclear Energy Production

- Fission reactions generate heat
- Steam drives turbines → electricity
- Low CO_2 emissions compared to fossil fuels



Nuclear Medicine

- Radiotherapy destroys cancer cells
- PET scans detect metabolic activity
- Radioisotopes used in diagnosis

Sterilization

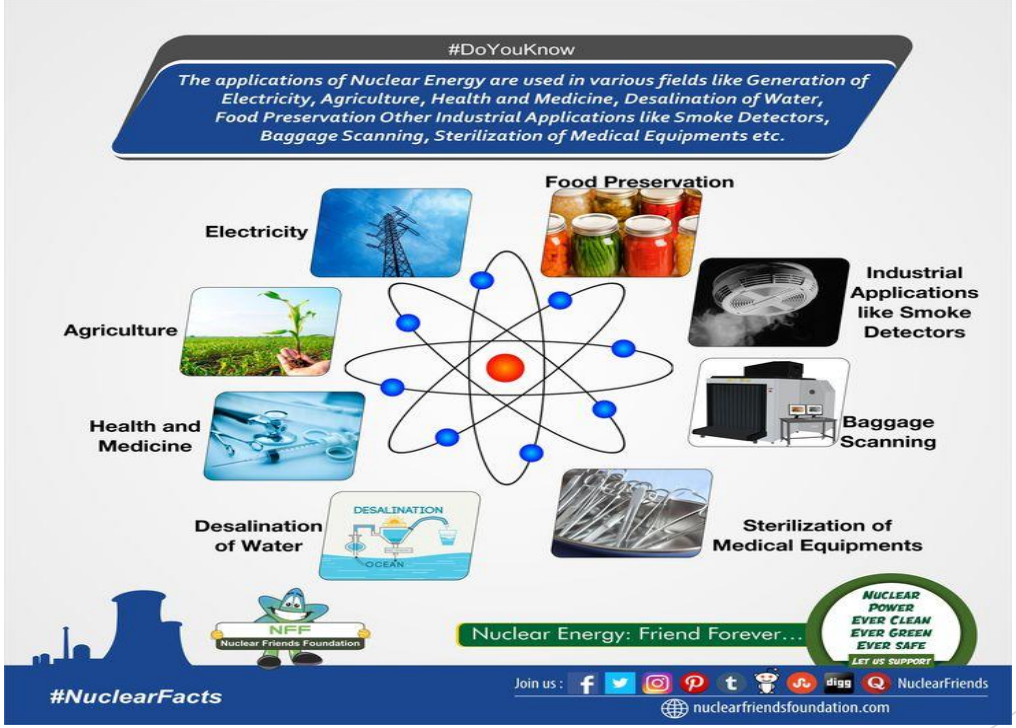
- Gamma radiation sterilizes equipment
- Used in hospitals and labs
- Prevents infection spread

Agricultural Applications

- Mutation breeding improves crops
- Sterile insect technique controls pests
- Increases food production

Industrial Applications

- Radiography inspects welds
- Thickness gauges in manufacturing
- Leak detection in pipelines

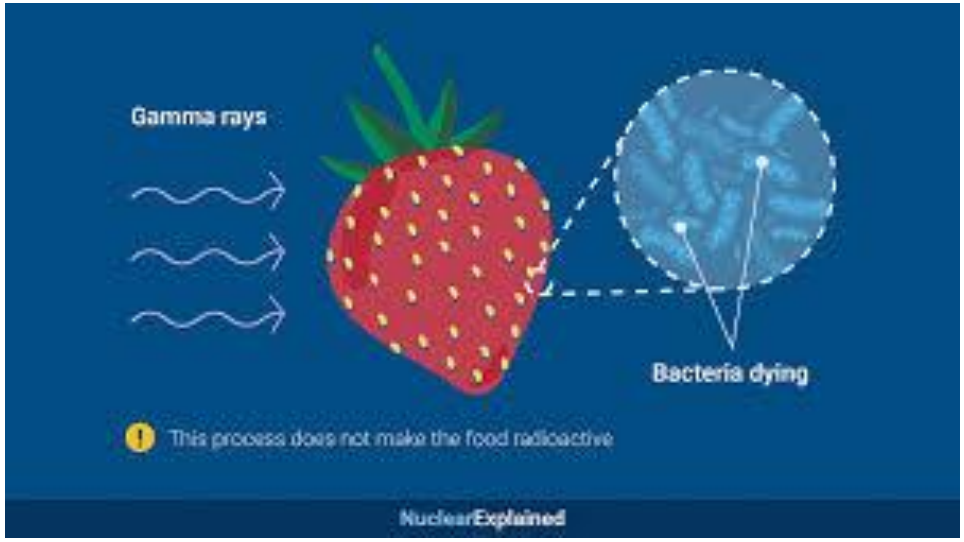


Environmental Protection

- Tracing pollutants using isotopes
- Studying groundwater movement
- Climate change research

Food Irradiation

- Kills bacteria like Salmonella
- Extends shelf life
- Maintains nutritional value

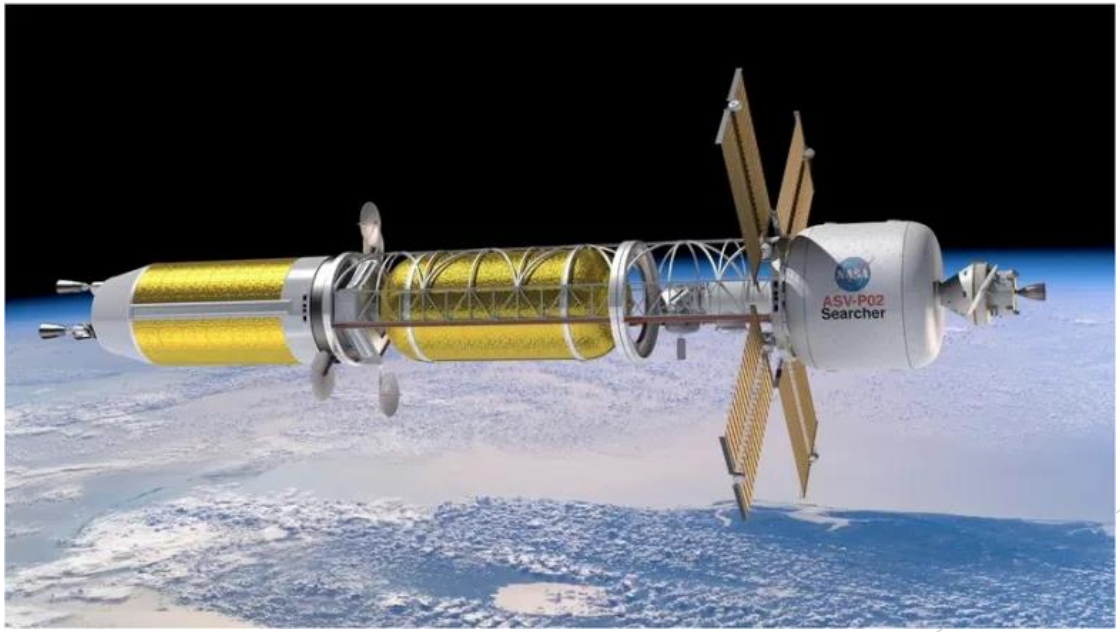


Space Applications

- RTGs power spacecraft

(RTG: Radioisotope Thermoelectric Generator (RTG) is a type of "nuclear battery" used to power spacecraft)

- Used in missions like Voyager
- Reliable for deep space



Advantages of nuclear energy

- Clean and efficient energy
- Medical breakthroughs
- Supports global food security
- Enhances industrial safety

Risks & Safety of nuclear energy

- Radiation exposure risks
- Waste disposal challenges
- Strict safety protocols required

International Regulation of Nuclear Energy

- IAEA sets global standards
- (IAEA: International Atomic Energy Agency)
- Monitoring nuclear activities
- Promotes safe use

THANKS FOR LISTENING

Conclusion

- Nuclear technology has vast peaceful benefits
- Essential in modern science and medicine
- Future depends on safe and responsible use