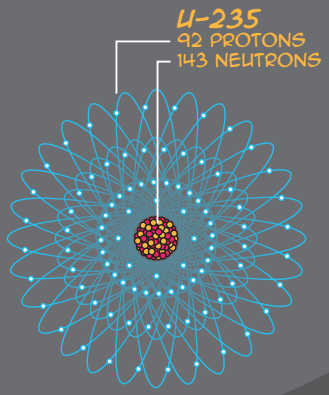
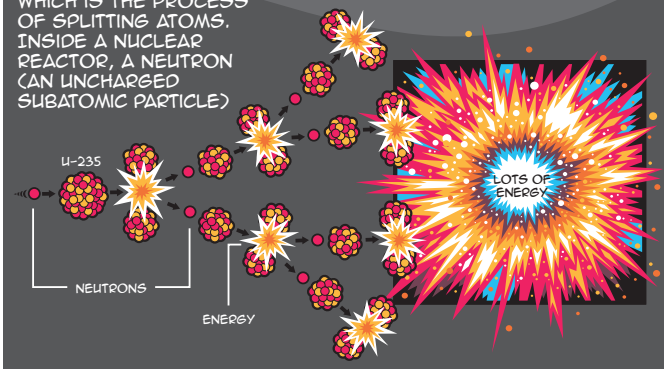
NUCLEAR

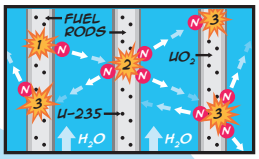
URANIUM IS A HEAVY METAL THAT IS MINED AND PROCESSED TO SERVE AS FUEL FOR NUCLEAR REACTORS. IT IS A RADIOACTIVE ELEMENT AND THE ISOTOPE URANIUM -235 CAN BE USED TO PRODUCE NUCLEAR ENERGY. ISOTOPES ARE VARIATIONS OF THE SAME ELEMENT, WITH AN ATOM HAVING A DIFFERENT ATOMIC WEIGHT DEPENDING ON THE NUMBER OF NEUTRONS IN ITS NUCLEUS.



NUCLEAR ENERGY IS CREATED THROUGH NUCLEAR FISSION, WHICH IS THE PROCESS OF SPLITTING ATOMS. INSIDE A NUCLEAR REACTOR, A NEUTRON (AN UNCHARGED SUBATOMIC PARTICLE)



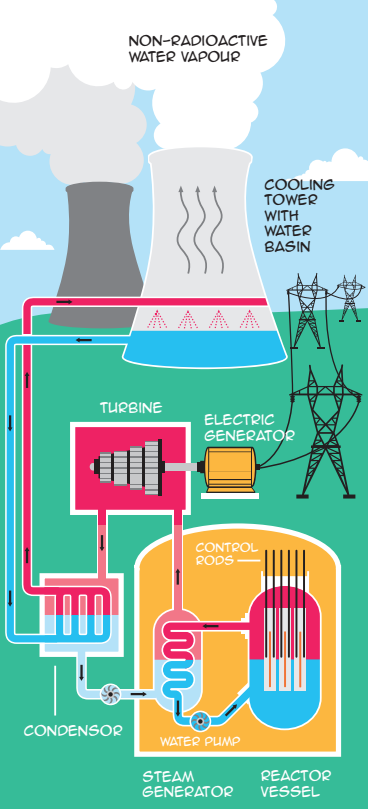
IS FIRED AT THE NUCLEUS OF THE ISOTOPE U-235. THIS EXTRA NEUTRON IN THE NUCLEUS MAKES THE ISOTOPE HEAVIER AND HIGHLY UNSTABLE. TO RELEASE THAT ENERGY, THE ISOTOPE SPLITS INTO TWO SMALLER ELEMENTS. IT ALSO RELEASES A FEW NEUTRONS IN THE PROCESS. THESE NEUTRONS GO ON TO COLLIDE INTO OTHER U-235 ISOTOPES, CAUSING A CHAIN REACTION (I.E., A NUCLEAR REACTION).

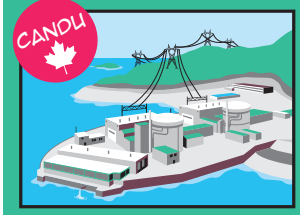


THE NEUTRONS RELEASED IN THE REACTION MOVE AT SPEEDS THAT MAKE IT DIFFICULT FOR THEM TO HIT OTHER ISOTOPES. TO MAKE SURE THE NUCLEAR REACTION CAN CONTINUE, THE NEUTRONS NEED TO BE SLOWED DOWN, OR "MODERATED." WATER IS USED AS A MODERATOR.

NEUTRONS BOUNCE OFF OF WATER'S HYDROGEN NUCLEI AND LOSE ENERGY WITH EACH COLLISION.

NUCLEAR REACTORS ALLOW FOR CONTROLLED NUCLEAR FISSION. CONTROL RODS, MADE FROM A MATERIAL THAT ABSORBS NEUTRONS, ARE RAISED OR LOWERED INTO THE NUCLEAR REACTOR TO CONTROL THE RATE OF FISSION. NUCLEAR FISSION PRODUCES A LARGE AMOUNT OF ENERGY, WHICH IS DISSIPATED AS HEAT.





THIS HEAT BOILS WATER AND CREATES STEAM TO POWER THE GENERATORS THAT PRODUCE ELECTRICITY.

CANADA HAS DEVELOPED ITS OWN UNIQUE NUCLEAR REACTOR TECHNOLOGY, CALLED CANDU, WHICH IT HAS EXPORTED TO THE WORLD.