

The Maryland Core Technologies

The Core Technologies as defined in Maryland are the major content elements used to create technology devices and systems. They can be identified singularly or in combination in all technology devices. They are related to specific areas of scientific discovery and experimentation, and maybe uniquely defined by their application of specific scientific principles and concepts. They also provide experimental application and functional application of mathematic theorems and proofs as they operate.

Materials technology - the technology of producing, altering and combining materials.

Applications: producing paper from wood, producing aluminum from ore, drilling holes in wood, annealing to soften metal, casting ceramic, welding metal, laminating wood.

Mechanical technology - the technology of putting together mechanical parts to produce, control and transmit motion. Applications: gear systems in a car transmission, brakes on a bicycle, agitator in a washing machine.

Electrical technology - the technology of producing, storing, controlling, transmitting and getting work from electrical energy. Applications: power plant generator, flashlight battery, light switch, electric motor in a can opener, door bell, electric heater, blow dryer.

Electronic technology - the technology of using small amounts of electricity for controlling; detecting; and information collecting, storing, retrieving, and communicating. Applications: thermostat for controlling temperature, a metal detector, video tape recorder, computer, pocket calculator, telephone, radio, television.

Structural technology - the technology of putting parts and materials together to create supports, containers, shelters, connectors and functional shapes. Applications: legs on a chair or table, city water tower, swimming pool, buildings, roadways, bridges, storm sewer, airplane wing, satellite antenna dish.

Fluid technology - the technology of using fluid, either gaseous (pneumatics) or liquid (hydraulics) to apply force or to transport. Applications: pneumatics: air brakes on a truck, tires on a car, airfoils on an airplane. warm air heating ducts and fan in a building hydraulics: brakes on a car, plumbing in school.

Optical technology - the technology of producing light; controlling light; using light for information collection, processing, storage, retrieval and communication; and using light to do work. Applications: light bulb, LED (Light Emitting Diode), lenses to magnify and reduce, laser speed detector, laser compact disk, fiber optic telephone communication, laser cutting tools, laser surgery instruments furnace.

Thermal technology - the technology of producing, storing, controlling, transmitting and getting work from heat. Applications: furnace, hot water heater, toaster, insulation, heat exchanger (radiator, condenser), refrigerator, jet engine, hot air balloon.

Bio technology - the technology of using, adapting and altering organisms and biological processes for a desired outcome. Applications: stain "eating" enzymes in detergent, bacteria "leaching" of metals from ore, altering plant genes to produce better crops.