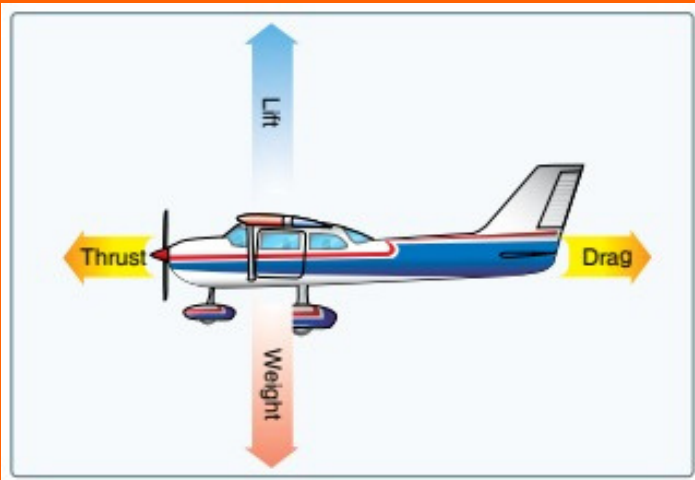


AERODYNAMICS



THE FOUR FORCES OF FLIGHT ARE LIFT, WEIGHT, THRUST AND DRAG. THESE FORCES MAKE AN OBJECT MOVE UP AND DOWN, AND FASTER OR SLOWER. HOW MUCH OF EACH FORCE THERE IS CHANGES HOW THE OBJECT MOVES THROUGH THE AIR

THERE ARE TWO TYPES OF FORCES THAT WILL AFFECT YOUR DESIGN—POSITIVE FORCES AND NEGATIVE FORCES. POSITIVE FORCES ACCELERATE (OR PUSH) THE DRAGSTER OFF THE STARTING LINE. NEGATIVE FORCES DECELERATE (OR PULL) THE DRAGSTER AWAY FROM THE FINISH LINE. THE CARTRIDGE FORCE IS A POSITIVE FORCE, WHILE SURFACE FRICTION AND DRAG ARE NEGATIVE FORCES.



FOR ALL THE DRAGSTERS IN THE CHALLENGE, A CO2 CARTRIDGE PROVIDES THE FORCE TO MOVE THE VEHICLE FORWARD. THE CARTRIDGES CONTAIN A LARGE VOLUME OF CARBON DIOXIDE GAS UNDER EXTREME PRESSURE. THE FIRING PIN ON THE START GATE MAKES A HOLE IN THE NOZZLE SO THE PRESSURIZED CO2 GAS ESCAPES, PRODUCING THRUST OR POSITIVE FORCE.



THESE FORCES ARE ALSO RELATED TO FLUID FLOW ALONG THE BODY OF AN AIRCRAFT. FLUID CAN FLOW IN THREE POSSIBLE REGIMES (LAMINAR, TURBULENT, OR TRANSITIONAL), AND THE CHARACTERISTICS OF FLUID FLOW IN EACH REGIME WILL AFFECT THE DRAG AND LIFT ON AN AIRCRAFT.