The use of dimensionless numbers in engineering and physics allows

- Data reduction of similar problems.

This means that a lot of experimental runs are avoided if data is correlated using appropriate dimensionless parameters.

Examples:

Thus the **Re** number is a measure of the type of behavior of the flowing fluid and can be used in real life applications, such as for designing fountain heads, water tubes and pumps etc. The Reynolds Number is a dimensionless ratio comparing the viscous and momentum forces in a moving fluid.

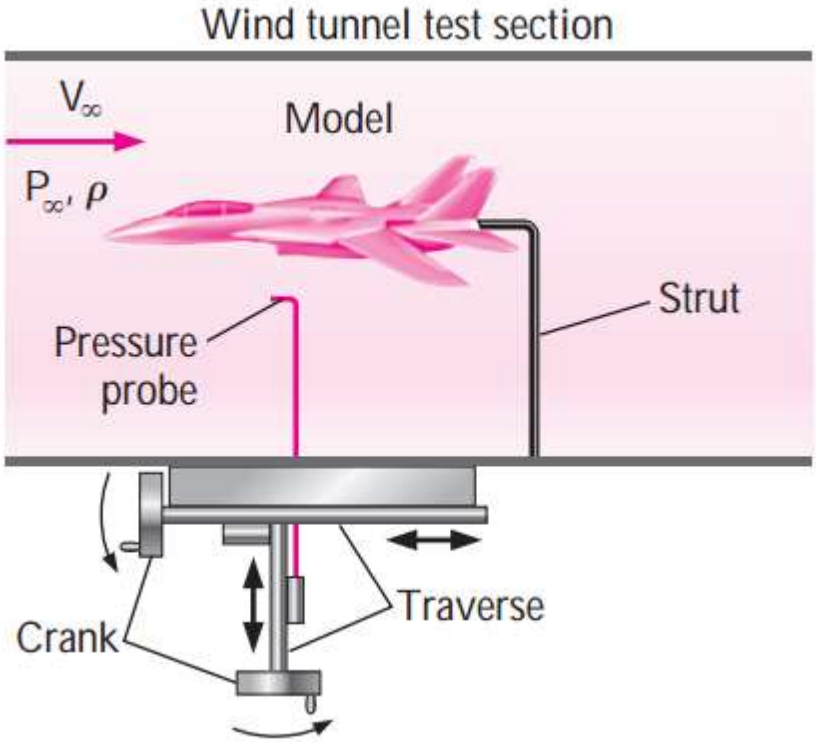
1) Reynolds number plays an important part in the calculation of the friction factor in a few of the equations of fluid mechanics, including the Darcy-Weisbach equation.

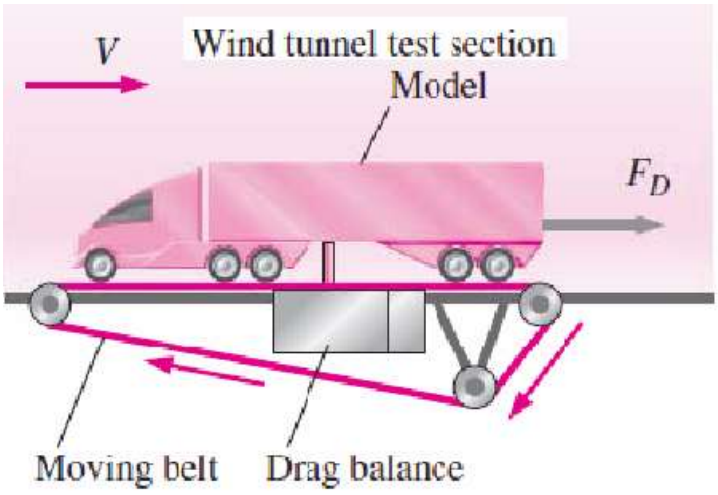
2) It is used when modeling the movement of organisms swimming through water.

3) Atmospheric air is considered to be a fluid. Hence, the Reynolds number can be calculated for it. This makes it possible to apply it in wind tunnel testing to study the aerodynamic properties of various surfaces.

4) It plays an important part in the testing of wind lift on aircraft, especially in cases of supersonic flights where the high speed causes a localized increase in the density of air surrounding the aircraft. Few applications are

Abbe number	**optics (dispersion in optical materials)**
Albedo	**climatology, astronomy (reflectivity of surfaces or bodies)**
Archimedes number	**motion of fluids due to density differences**
Colburn j factor	**dimensionless heat transfer coefficient**


Wind tunnel test section
V_∞
Model
P_∞, ρ
Strut
Pressure probe
Traverse
Crank


V
Wind tunnel test section
Model
F_D
Moving belt
Drag balance