

## FRICTION

### KEY IDEAS

- Friction is a force that opposes movement between two surfaces
- Drag is a frictional force that slows things down in air and water (gases and liquids)
- Streamlined shapes move more easily through air and water (gases and liquids)

### EXAMPLE QUESTIONS

- How can you make a slippery surface?
- How can you stop things slipping?
- How could you make things 'slow down' or 'speed up'?

## FRICTION

- Friction is the name we give to the force that slows down moving objects.
- It always acts in the direction opposite to that in which the object is moving.
- When friction is high, surfaces cannot slide easily over one another.
- This can be helpful when a good grip or slowing down is necessary.
- Friction can be reduced by making surfaces slippery.
- When friction is low, surfaces can slide easily over one another. For example, snow on the hillside allows the skis to slide easily because the force of friction is reduced.
- It would be difficult to ski down a hillside without snow; the skis rubbing against the surface would be stopped by the force of friction.
- In some circumstances, low friction can be a nuisance or dangerous, as when driving on icy roads.

## DRAG

- Drag is the name given to a particular kind of frictional force that acts on objects when they move through a liquid or gas.
- The object has to push aside the liquid or gas to get through, so the liquid or gas pushes back on the object.
- Sometimes it can be useful because it slows down moving objects (such as air pushing up on a descending parachute).
- Objects can move faster through air and water (and other gases and liquids) if their shapes are streamlined to cause as little drag as possible.
- Streamlining helps the object 'cut through' gases or liquids.
- Cars, aeroplanes and rockets are streamlined for this reason.

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