

## READING

### **Energy**

Energy is the ability to do work. It is what enables something to "do something". For example, gasoline in a car is a source of energy which enables the car to move. The sun is a source of energy which heats the earth and sustains all processes that make the planet suitable for life such as ours. Energy can also change from one form to another. For example, I can rub two sticks together to make them warmer. What I am doing is changing the energy of motion (due to the rubbing action) into heat energy, which is what makes the sticks warm up.

### **Force and motion**

When you push or pull on an object you are exerting a force on it. If the object is not held in place by something then it will move. The harder you push, or pull, on the object the faster it will move. Forces are fundamental to nature and arise from the contact between two or more objects. Objects that are in contact exert a force on each other and objects that are not in contact do not exert a force on each other. An exception to this is gravity and magnetism which both cause a force to be exerted between objects even if they are not touching. Gravity and magnetism can be thought of as "invisible" forces. There are also aerodynamic forces which (for example) are the forces which hold up a plane and move it forward. These forces are caused by the contact of the plane body, and propeller, with the surrounding air.

### **Gravity**

Gravity is a type of force related to the mass of objects. It is fundamental in nature. It is a force of attraction which exists between all objects. The more mass an object has, the greater its gravitational force of attraction on other objects. All objects have mass which means that all objects exert a gravitational "pulling" force on all other objects, but unless an object is very massive (like the earth) the amount of gravitational force it exerts on another object is negligible. Everyday objects such as cars, bicycles, and buildings are way too small to exert significant gravitational force. The other interesting thing about gravity is that the gravitational "pulling" force between objects occurs no matter how far away they are from each other. But the closer two objects are the more gravitational force exists between them. For example, a gravitational force exists between you and the (very massive) earth which means that you are "pulled" towards the earth. This pulling force is what keeps you on the ground. Otherwise you would float away. If you lift an object, such as a ball, and let it go, it will fall. This is due to the force of gravity pulling down on it. An object is said to defy gravity if it floats above the ground and doesn't fall. For an object to do this it must generate a lifting force to resist the force of gravity so that it doesn't fall.