relative motion | observations of the sky | the earth's gravity | forces and motion

9-12

Gravitational force is an attraction between masses. The strength of the force is proportional to the masses and weakens rapidly with increasing distance between them.

6-8

The sun's gravitational pull holds the earth and other planets in their orbits, just as the planets' gravitational pull keeps their moons in orbit around them.

Every object exerts gravitational force on every other object. The force depends on how much mass the objects have and on how far apart they are. The force is hard to detect unless at least one of the objects has a lot of mass.

Because every object is moving relative to some other object, no object has a unique claim to be at rest. Therefore, the idea of absolute motion or rest is misleading.

If a force acts toward a single center, the object's path may curve into an orbit around the center.

Everything on or anywhere near the earth is pulled toward the earth's center by gravitational force.

An unbalanced force acting on an object changes its speed or direction of motion, or both.

3-5

The earth is one of several planets that orbit the sun, and the moon orbits around the earth.

Changes in speed or direction of motion are caused by forces.

People cannot determine how the solar system is put together just by looking at it.

The rotation of the earth on its axis every 24 hours produces the night-and-day cycle. To people on earth, this turning of the planet makes it seem as though the sun, moon, planets, and stars are orbiting the earth once a day.

The patterns of stars in the sky stay the same, although they appear to move across the sky nightly, and different stars can be seen in different seasons.

The earth is approximately spherical in shape. Like the earth, the sun and planets are spheres.

The earth's gravity pulls any object on or near the earth toward it without touching it.

K-2

The sun can be seen only in the daytime, but the moon can be seen sometimes at night and sometimes during the day. The sun, moon, and stars all appear to move slowly across the sky.

Circles, squares, triangles, spheres, cubes, cylinders and other shapes can be observed in things found in nature and in things that people build.

Things near the earth fall to the ground unless something holds them up.

The way to change how something is moving is to give it a push or a pull.