

At-a-distance interaction pairs = force pairs that involve field forces

- While these action-reaction pairs of forces are not often as obvious, they still exist

Example 1: Consider a free-falling object close to the Earth surface. If this object has mass of 10.0 kg, the Earth is acting on the object with force:

However, Newton's Third Law tells us that the object also pulls on the Earth with the force of equal magnitude but opposite in direction:

The object's pull has no effect on the Earth due to the enormous disproportion between the Earth's mass and the object's ~~mass~~ **mass**.

- By Newton's Second Law, if no other forces were acting onto the Earth at the time, the acceleration caused by the 10.0-kg object would be:

∴ This acceleration is negligible.

**Example 2: Opposite electric charges attract each other:**

- The force of attraction is the electrostatic force between the two charges
- Note, the electric force exists without the two charges being in contact. However, it is essential for the charges to be relatively close to each other to feel the effect of the field force.

**Example 3: Opposite poles on a bar magnet also attract each other without having a surface of contact. This force of attraction becomes negligible if the magnet move further apart.**