

Tutorial 3 Homework
Newton's third law

Name _____

Tutorial section _____

I. Newton's 3rd law and gravity

A thoughtful student puts forth the following argument about when Newton's 3rd law applies.

I understand why Newton's 3rd law applies to contact forces, the forces objects exert on each other while touching, like when a truck hits a car. But I don't think Newton's 3rd law applies to gravity. When you drop a ball, the Earth exerts a gravitational force upon it, which makes the ball rush down to the Earth. But according to Newton's 3rd law, the ball exerts just as big a force on the Earth as the Earth exerts on the ball. That can't be right! The Earth doesn't "rush up" to meet the ball. This goes to show that the Earth exerts a bigger force on the ball than the ball exerts on the Earth. So, Newton's 3rd law isn't true for gravity.

How would you respond to the student?