Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

5 Newton's laws of motion

Exercise C, Question 3

Question:

A child jumps off a table and lands on the ground. Describe how the force that the ground exerts on the child varies. Also describe how the force that the child exerts on the ground varies.

Solution:

The higher the table jumped from, the larger the forces involved. Before landing there is no force between the child and the ground. On impact, the force exerted on the child by the ground increases and is upwards. Newton's third law says the force on the ground by the child is equal in size but is downwards. The magnitude of these forces increases (to decelerate the child) and then decreases again until the force exerted upwards by the ground on the child balances the child's weight.