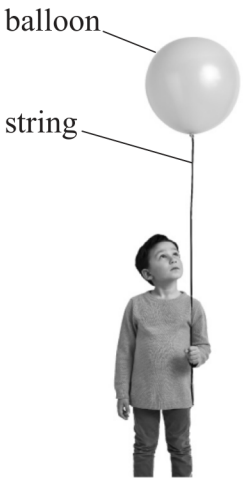
14 A child is holding a balloon by a string, as shown. The balloon contains helium gas. Helium gas is less dense than air.



(Source: © pinstock/Getty Images)

(a) The child releases the balloon by letting go of the string.

Calculate the resultant force on the balloon immediately after it is released.

mass of balloon and string = 9.20×10^{-3} kg
volume of balloon and string = 5.00×10^{-2} m^3
density of air = 1.20 kg m^{-3}

(4)

Resultant force = ...

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*(b) Immediately after the balloon is released, it begins to move upwards.

The density of the air remains constant and there is no wind.

Explain how the forces acting on the balloon affect its motion as it moves upwards from the moment it is released.

(6)

(Total for Question 14 = 10 marks)