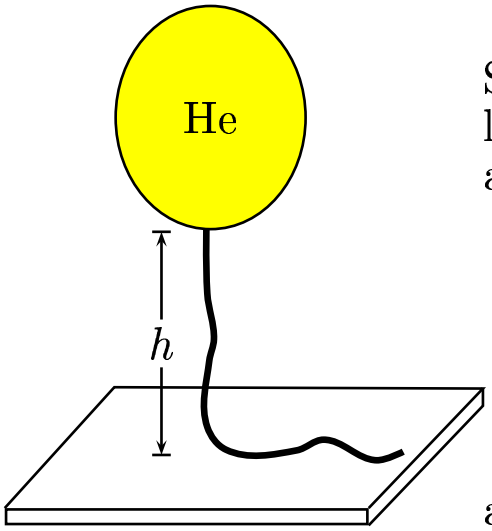

Consider a balloon floating in the air. See sketch. There is a string tied to the balloon. The string has a weight of W_{string}, and a length L.

Define the following set of symbols.

$V_b =$ Volume of the balloon.

$W_b =$ Weight of the balloon.

$W_{He} =$ Weight of the helium within V_b.

$W_{air} =$ Weight of the air in a volume V_b.

$h =$ Length of the part which is in the air.

Choose the correct relation (neglect the string volume)

A) $W_{air} = W_{He} + W_{string} \left(\frac{h}{L} \right)$.

B) $W_{He} = W_b + W_{string}$.

C) $W_{air} = W_b + W_{He} + W_{string}$.

D) $W_{air} = W_b + W_{He} + W_{string} \left(\frac{h}{L} \right)$.

Apply Archimedes' principle.

The buoyant force equals to W_{air}, which lifts the weight of the portion of the object, which floats in the air.

Answer **D**