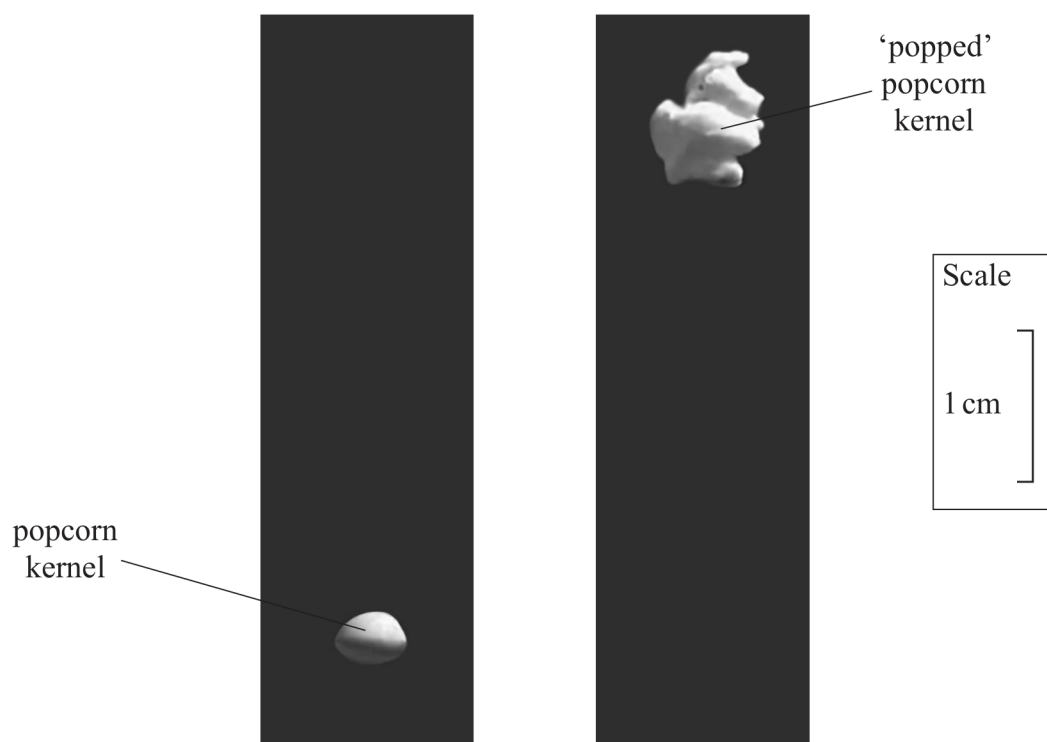


- 16 Popcorn kernels contain water. When heated, the water turns to steam. The kernel 'pops' and moves upwards.



- (a) The photographs above show a popcorn kernel just before popping and at the maximum height after popping. The time between the two photographs was 83 ms.
- (i) Determine the maximum height after popping.

(2)

Maximum height = .....



(ii) Calculate the initial speed of the ‘popped’ popcorn kernel.

(3)

Initial speed = .....

(b) The average water content in a popcorn kernel is 14% of the total mass of the kernel.

A kernel is heated until it pops. Steam is ejected downwards, and the popped kernel moves upwards with an initial speed of  $1.5\text{ m s}^{-1}$ .

Calculate the speed at which the steam is ejected.

total mass of unpopped kernel = 0.11 g

(4)

Speed = .....

(Total for Question 16 = 9 marks)