



## Problem of the Week

### Problem C and Solution

#### Drying Fruit

#### Problem

Fruit can be preserved through drying to remove excess moisture.

The water content of a certain fruit, by mass, is 70%. Therefore, 30% of the fruit, by mass, is other material.

When left in the sun to dry, the fruit loses 80% of its water content, and the amount of other material remains the same.

Rounded to the nearest tenth, what percent of the dried fruit is water?

#### Solution

##### Solution 1

Let's consider a piece of fruit that originally weighs 100 g. Since 70% of the mass is water, that means that 70 g is water and 30 g is other material.

When left in the sun to dry, the fruit loses 80% of its water mass. So it loses 80% of 70 g =  $0.8 \times 70 = 56$  g of water, and  $70 - 56 = 14$  g of water remains.

The dried fruit still contains 30 g of other material. Therefore, the dried fruit consists of 14 g of water and 30 g other material, for a total of 44 g.

Therefore, the dried fruit is  $\frac{14}{14 + 30} \times 100\% = \frac{14}{44} \times 100\% \approx 31.8\%$  water.

##### Solution 2

Suppose the fruit originally weighs  $x$  g. Since 70% of the mass is water, that means that 70% of  $x = 0.7 \times x = 0.7x$  g is water and 30% of  $x = 0.3x$  g is other material.

When left in the sun to dry, the fruit loses 80% of its water mass. So it loses 80% of  $0.7x = 0.8 \times 0.7x = 0.56x$  g of water, and therefore  $0.7x - 0.56x = 0.14x$  g of water remains.

The dried fruit still contains  $0.3x$  g of other material. Therefore, the dried fruit consists of  $0.14x$  g of water and  $0.3x$  g of other material, for a total of  $0.44x$  g.

Therefore, the dried fruit is  $\frac{0.14x}{0.14x + 0.30x} \times 100\% = \frac{0.14x}{0.44x} \times 100\% \approx 31.8\%$  water.