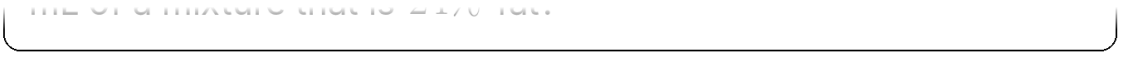
Mixtures

RP19-V1 · storyboard · RP19 Mixtures and concentration. Read each picture with its sentences.

Picture 1



$$c + m = 400 \quad \text{the mixture}$$

$$0.36c + 0.04m = 0.24 \times 400 = 96$$

the fat

$$0.36c + 0.04(400 - c) = 96 \quad m = 400 - c$$

$$0.32c = 80$$

$$\boxed{c = 250 \text{ mL}, \quad m = 150 \text{ mL}}$$

Check: $0.36 \times 250 + 0.04 \times 150 = 90 + 6 = 96$ ✓

1. Cream is 36 percent fat and milk is 4 percent fat.
2. How much cream is in 400 millilitres of a mixture that is 24 percent fat?
3. Let c and m be the millilitres of cream and milk.
4. For the mixture: c plus m is 400.
5. For the fat: 0.36 c plus 0.04 m equals 0.24 times 400, that is 96.
6. Put in m equals 400 minus c.
7. Then 0.32 c equals 80.
8. So there are 250 millilitres of cream and 150 of milk.
9. Check the fat: 90 plus 6 is 96.

Picture 2

Trap 36% and 4%

$\times$ half and half: 20%

✓ 250 mL : 150 mL

10. Watch for the trap: averaging the concentrations.
11. Half and half would give 20 percent, and that only works with equal amounts.

Picture 3

A beaker holds 180 mL of 20% acid. How many mL must be poured out and replaced with pure acid so that it holds 30% acid?

$$36 - 0.2x + x = 0.3 \times 180 = 54$$

pour out x, add x of pure acid

$$\boxed{0.8x = 18, \quad x = 22.5}$$

12. A beaker holds 180 millilitres of 20 percent acid.
13. How much must be poured out and replaced with pure acid so that it holds 30 percent acid?
14. There are 36 millilitres of acid.
15. What you pour out takes its share of acid with it, 0.2 x, and then you add x of pure acid.
16. The acid must be 54.
17. So 0.8 x is 18, and x is 22.5 millilitres.

Picture 4

Trap pour out x mL of 20% acid

$$\times \; 36 + x = 54$$

$$\checkmark \; 36 - 0.2x + x = 54$$

18. Watch for the trap: pouring mixture out without taking out its share of the acid.
19. The x millilitres you pour out hold 0.2 x of acid.