Sometimes a patient's dosage is based on their bodyweight. For example, when giving a drug to a child it may be required that you adjust the dosage based on how much they weigh, as assigning a dosage based on age could result in the child taking too much or too little of the drug.

The formulae

Daily dose ((mg or ml)/day) = Patient weight (kg) x Dosage for one day ((mg or ml)/kg/day)

Single dose ((mg or ml)/dose) = $\dfrac{\text{Daily dose ((mg or ml)/day)}}{\text{Number of doses in a day (doses/day)}}$

Dose volume (ml/dose) = $\dfrac{\text{Single dose (mg/dose)}}{\text{Concentration of drug (mg/ml)}}$

Dosages may not necessarily be given per day. They could be per hour, or any time frame. The calculations remain the same, but be careful about units and potentially needing to convert values.

How to calculate drug dosage per kg

Step 1	Determine the dosage of the drug. This is usually written on the drug's packaging, it will usually say something like 'administer 5mg/kg of bodyweight/day'.
Step 2	Weigh the patient in kg.
Step 3	Multiply the dosage by the patient's weight.
Step 4	Divide the dosage by the number of times the patient will take the drug in the day. This will give you the amount of the drug that the patient needs to take in a single dose.
Step 5	If the drug is in liquid form, it will have a concentration. This will be something like '2mg/ml'. In order to calculate the volume to be administered, divide the single dose by the concentration.

Example

A patient is prescribed a drug. The dosage of the drug is 3mg/kg of body weight/day, and the patient weighs 40kg. The drug comes in liquid form with a concentration of 2mg/ml. What volume of the drug should the patient be given in a single dose if they must take the drug 2 times per day?

Answer

Step 1	The dosage of the drug is 3mg/kg of bodyweight/day.
Step 2	The patient weighs 40kg.
Step 3	Daily dose (mg/day) = weight (kg) x dosage (mg/kg/day) Daily dose (mg/day) = 40kg x 3mg/kg/day = 120mg/day.
Step 4	The patient must take the drug 2 times per day. Single dose (mg/dose) = $\dfrac{\text{Daily dose (mg/day)}}{\text{Number of doses in a day (doses/day)}} = \dfrac{120 \text{ mg/day}}{2 \text{ doses/day}} =$ 60mg/dose.
Step 5	The concentration of the drug is 2mg/ml. Volume of drug in a dose (ml/dose) = $\dfrac{60 \text{ mg/dose}}{2 \text{ mg/ml}}$ = 30ml/dose.

Remember to include units.

Be careful when reading questions. There are a few ways they can be made more difficult:

- Adding information that you don't need into the question.

- Asking you to round the final dosage.

- Giving the information in the wrong units, which you will need to convert before you do the calculation.

There are factsheets on how to deal with these things in the maths factsheet section!