

**Water quantity: 2 liters**

**Airflow rate of the pump: 180 L/hr**

**To find: the optimal time to run the air pump**

The standard recommendation for DWC hydroponic systems is to provide around 1-2 liters of air per minute (LPM) per gallon of water (which is roughly 3.8 liters). Since we have 2 liters of water, let's convert that to gallons:

2 liters  $\approx$  0.53 gallons

So, for our system, we should aim for approximately 0.53 to 1.06 LPM of air.

Given that our air pump has a flow rate of 180 L/hr, let's convert that to LPM:

$180 \text{ L/hr} \div 60 \text{ min/hr} = 3 \text{ LPM}$

our air pump is capable of providing 3 LPM of air.

Now, if we want to provide the recommended 0.53 to 1.06 LPM of air per gallon of water, we'll use the average value:

$(0.53 \text{ LPM} + 1.06 \text{ LPM}) / 2 = 0.795 \text{ LPM}$

Now we have a target air flow rate of 0.795 LPM.

To calculate the time we should run the air pump, we can use the formula:

$\text{Time (hours)} = \text{Water quantity (liters)} / \text{Target air flow rate (LPM)}$

$\text{Time (hours)} = 2 \text{ liters} / 0.795 \text{ LPM} \approx 2.52 \text{ hours}$

**Hence, we should run the air pump for about 2.5 to 3 hours.**