E. Coli bacteria Under Microscope for ~~2.6 min~~ 12 hrs

Eq^n we have is $\frac{dy}{2^x \log_e(2)} = dx$

now, we have x & we need to find y for every x.

x	y
1	
2	
6	
7	
8	
9	
11	
12	

Note This function is descreate it has specific values for each x value

$$dy = 2^x \ln(2)\, dx$$

now, $\int dy = \int 2^x \ln(2)\, dx$

as, $\int dy = \int a^x \ln(2)\, dx$

$$y = \ln(2) \int a^x dx$$

$$y = \ln(2) \boxed{\frac{a^x}{\ln(a)}} + k$$

i.e.

$$y = \ln(2) \frac{2^x}{\ln(2)} + k$$

$$\boxed{y = 2^x + k}$$

at $x=0$ $y=1$

$\therefore \quad 1 = 2^0 + k$

$\therefore \boxed{k=0}$

Now, $\boxed{y = 2^x}$

This is the funct^n means at this rate the number of bacteria are increasing.

Now,

$x=1$	$y=2$
$x=2$	$y=4$
$x=6$	$y=64$
$x=7$	$y=128$
$x=8$	$y=256$
$x=9$	$y=512$
$x=11$	$y=2048$
$x=12$	$y=4096$

We got the data, Now we will plot it in the form of histogram.

(bin size) no. of bins $\Rightarrow \therefore 1 + \log_2(n)$

$N = 1 + \log_2(2^{12})$

$\boxed{N = 13}$

we will need N For Histogram plotting