Say the true value at the point we're stepping is:

$\rightarrow \quad y(x+h)$

It can be expressed in 2 ways

$$y(x+h) = y_1 + h^5 \phi(x) + \cancel{O(h^6)} \quad -(1)$$

(ignored)

[ϕ is some func. of x]

[y_1 is estimate from RK4, with stepsize h]

$$y(x+h) = y_2 + 2\left(\frac{h}{2}\right)^5 \phi(x) + \cancel{O(h^6)} \quad -(2)$$

(ignored)

[y_2 is estimate of $y(x+h)$ for $\boxed{\text{2 steps}}$ of RK4 with stepsize $h/2$. Each step has an error of $O\left[\left(\frac{h}{2}\right)^5\right]$, hence factor 2]

Solving (1) & (2), we get

$$y(x+h) = \frac{16y_2 - y_1}{15}$$

$\boxed{\text{No. of steps}}$

Method 1 uses 4 ~~steps~~ func evals (usual RK4) per step

Method 2 uses 11 ~~steps~~ func evals (1 RK4 of h, 2 RK4 of $h/2$) per step

4 evals   8 evals.

but first step can be reused in (2)

so $8+4-1 = 11$

So if no. of evals is to be same

$\boxed{4 \times nstep1 = 11 \times nstep2}$