$$
\begin{aligned}
D_{\mathrm{JS}}(P,Q) &= -\sum_{x\in\mathcal{X}} \frac{P(x)+Q(x)}{2}\log_2\left(\frac{P(x)+Q(x)}{2}\right) + \frac{1}{2}\sum_{x\in\mathcal{X}} P(x)\log_2 P(x) + \frac{1}{2}\sum_{x\in\mathcal{X}} Q(x)\log_2 Q(x) \\
&= \sum_{x\in\mathcal{X}} Q(x)\frac{1}{2}\left[\left(\frac{P(x)}{Q(x)}+1\right)\log_2\left(\frac{2}{\left(\frac{P(x)}{Q(x)}+1\right)}\right) + \frac{P(x)}{Q(x)}\log_2\left(\frac{P(x)}{Q(x)}\right)\right] \\
&= \sum_{x\in\mathcal{X}} Q(x) f_{JS}\left(\frac{P(x)}{Q(x)}\right). \qquad \square
\end{aligned}
$$