Let d, e be two positive integers and let $a \in \mathbb{Z}$. Assume that $\gcd(d, e) = 1$ and $d|a, e|a$. Then prove that $de|a$.

(Recall our definition of $d|a$ is that there exists an integer k such that $a = kd$. Also, remember the result that we proved in class, which says if $d|ab$ and $\gcd(d, a) = 1$, then $d|b$.)