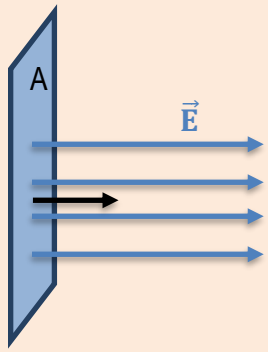
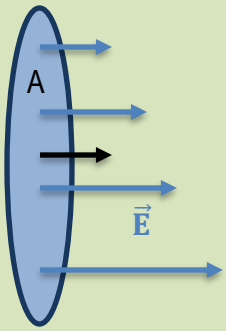
CONCEPT: ELECTRIC FLUX WITH CALCULUS

CONSTANT ELECTRIC FLUX



$\Phi_E = EA\cos\theta$

CHANGING ELECTRIC FLUX



$\Phi_E =$ _____

- When the Electric Field *or* area vector changes along a surface, we use _____ to calculate Electric Flux.
  - Electric field may be a *function* of a position variable (like $\vec{E} = E_0 y\,\hat{x}$)

EXAMPLE: What is the electric flux through a rectangle of length ℓ and width w in the xy-plane due to a changing electric field with magnitude $\vec{E} = E_0\left(\frac{x}{l}\right)\hat{z}$, as shown below?