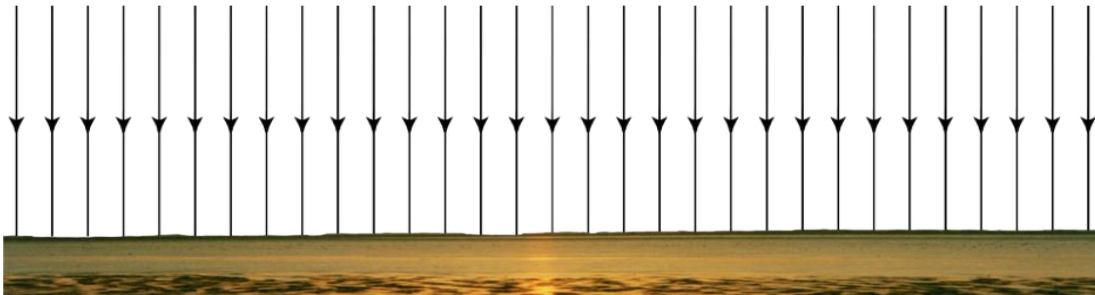
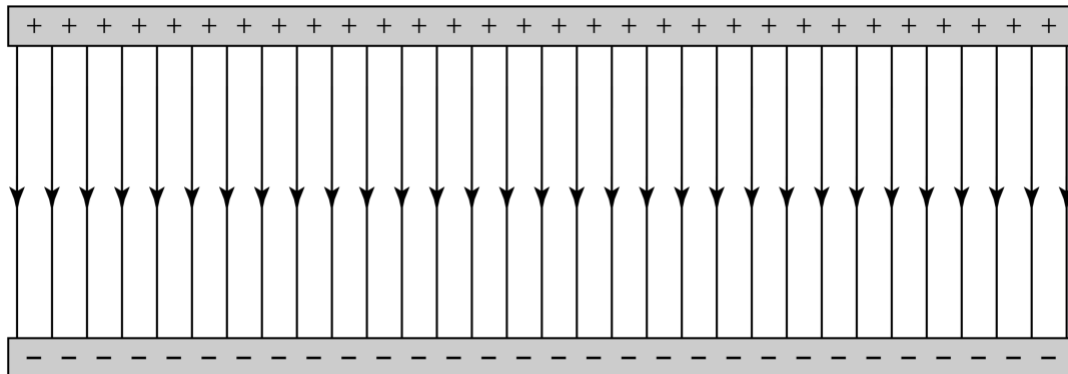


We have already learned that, when viewed at a local level, the gravitational field near the surface of a planet has a uniform magnitude and is directed downward toward the center of the planet.



And we have learned that the electric field which exists between two parallel plates of uniform, opposite charge also has a uniform magnitude and is directed from the positively charged plate to the negatively charged plate. [Last time](#) we showed where that electric field came from.

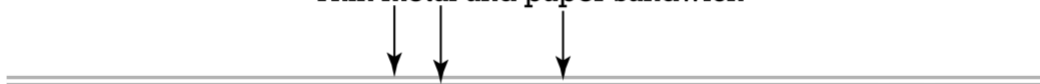


Ideal, uniform electric field between two parallel, oppositely charged plates.

Before we move on, let's discuss some of the limitations of this illustration:

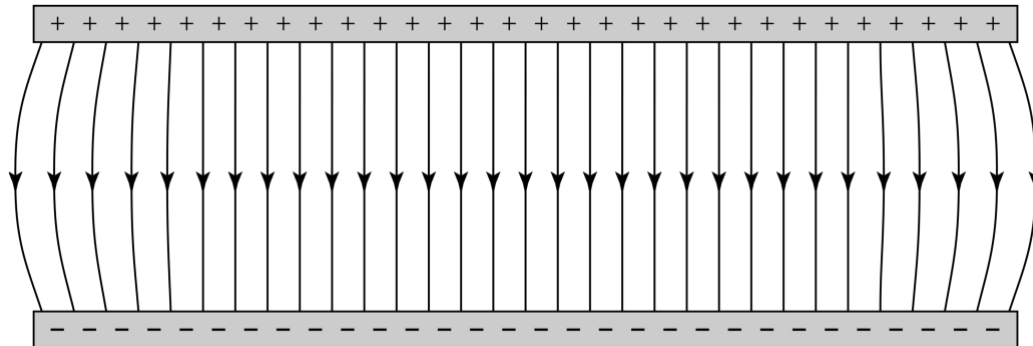
- Both plates are generally thin sheets of conducting metal.
- The distance between the two plates is typically very small.
 - Usually there is a thin sheet of insulating material which is basically a sheet of paper between the two thin, metal, parallel plates.

- So, in reality, it looks closer to this:
Thin metal and paper sandwich



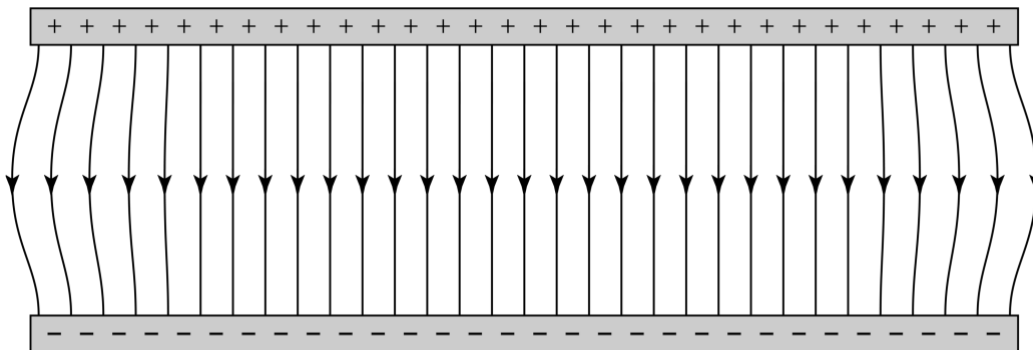
- It would be very difficult to understand what is going on if that were the illustration.
- The main point: In an ideal world, the two, thin parallel plates can be considered to be infinitely large.

When a pair of parallel plates are non-ideal and the two plates cannot be considered to be infinitely large, you might see the electric field illustrated like this



Non-ideal, nearly uniform electric field between two parallel, oppositely charged plates with an error.

The error here is that the electric field near a conductor in electrostatic equilibrium is always perpendicular to the conductor. We learned this [last time](#)! A better approximation of the nonideal electric field is this:



Non-ideal, nearly uniform electric field between two parallel, oppositely charged plates.

Another error with this illustration has to do with the charges. Because a non-ideal pair of parallel plates has plates which are not infinitely large, the charges in the non-ideal parallel plates are not quite uniformly distributed. It turns out that the charges will be closer together near the edges of the plates and farther apart near the middle of the plates. However, the illustration above is what you usually see when representing a non-ideal electric field between a pair of parallel plates.