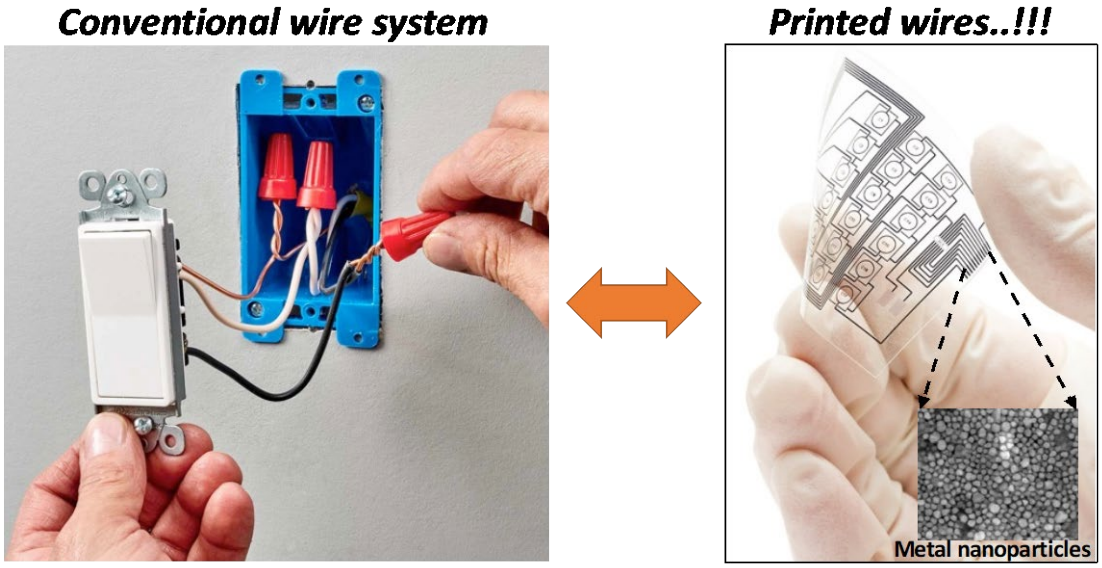
Healthcare

Printed Flexible Electronics

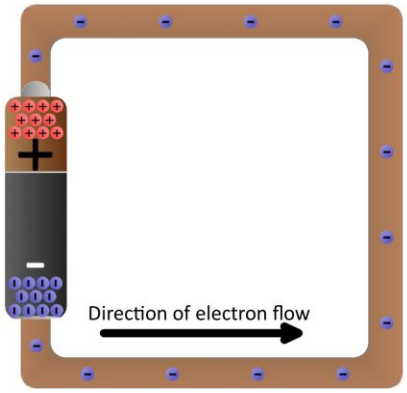


Printed flexible electronics is a cool and emerging field of technology that involves creating electronic devices on flexible materials, like plastic or paper, using printing techniques. It's a bit like printing a circuit board, but instead of using rigid materials, we use flexible ones. The advantage of printed flexible electronics is that they are lightweight, low-cost, and can conform to curved surfaces, making them perfect for wearable devices, like fitness trackers or medical sensors. They can also be used in cars or airplanes to make components that fit into irregular shapes. The key to printed flexible electronics is the use of conductive inks with suspended metal nanoparticles. These inks are formulated to have high electrical conductivity and can be printed onto flexible substrates to create electrical circuits, sensors, and other electronic components. Also, it is important to think of energy conservation by preserving our natural resources, reducing greenhouse gas emissions, and saving money. Piezoelectric effect is a phenomenon where certain materials can generate an electrical charge in response to mechanical stress or deformation, and vice versa, where the application of an electrical charge can cause a change in shape or deformation of the material. A simple example of the piezoelectric effect can be observed in quartz crystals commonly used in watches. When a voltage is applied to the crystal, it vibrates and produces an accurate time measurement. Conversely, when a mechanical force is applied to the crystal, it

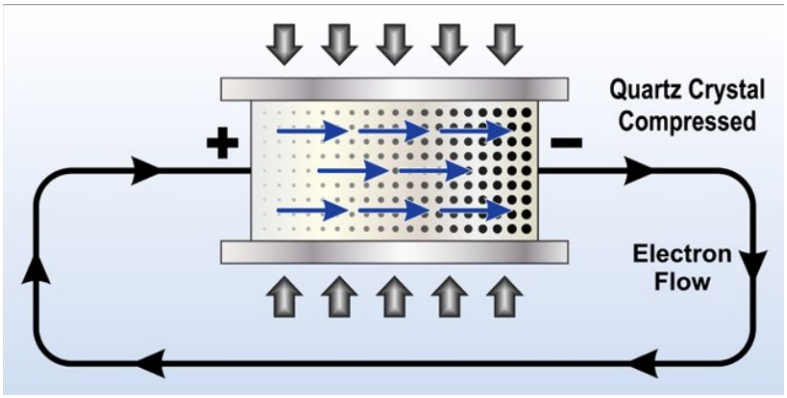
generates a voltage which can be used to power the watch. It is exactly like a battery but works with the mechanical force! Let's see this effect by integrating the piezoelectric effect and printable electronics.

So here we can try the piezoelectric surface connected on one side and a green LED light on the other side. You can see a double arrow that is having a space in between which we will use to check how printable electronics work.

A simple battery

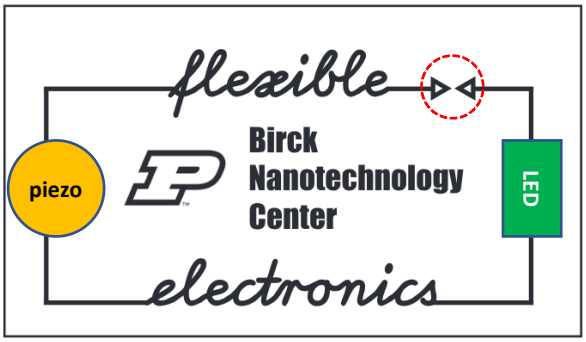


A Piezoelectric effect



Let's do the nanotechnology activity:

- Carefully apply the adhesive pen on the red circle.
- Blow dry the circle with a hair dryer.
- Now try to tap the piezo button and see what happens….



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