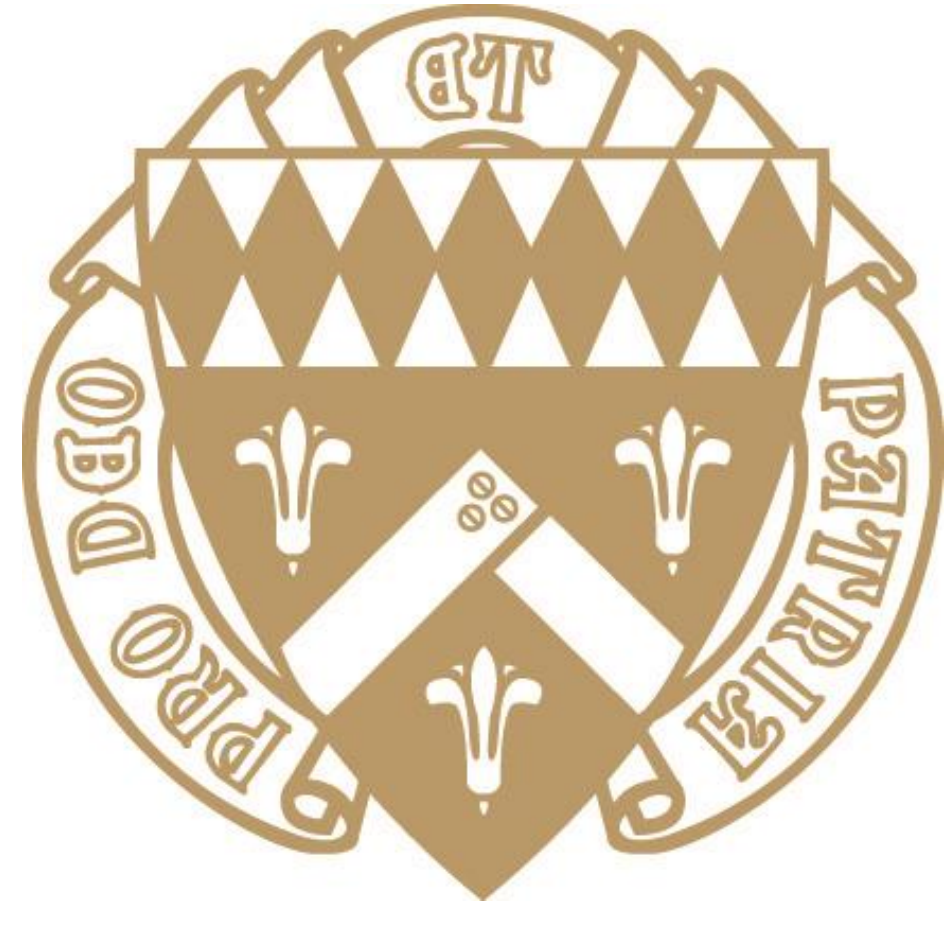


# Thermoelectric Power Generator to charge Personal Devices



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## Introduction

- Campers, Hikers and Outdoor enthusiasts are always looking for efficient ways to generate energy for devices.
- Having a small and portable charging device is important to the consumer due to little storage when doing outdoor activities
- Using renewable energy is significant due to park regulations and protection of the environment.
- This device would use naturally occurring temperature difference energy to transform to a DC electrical output to power a small device.

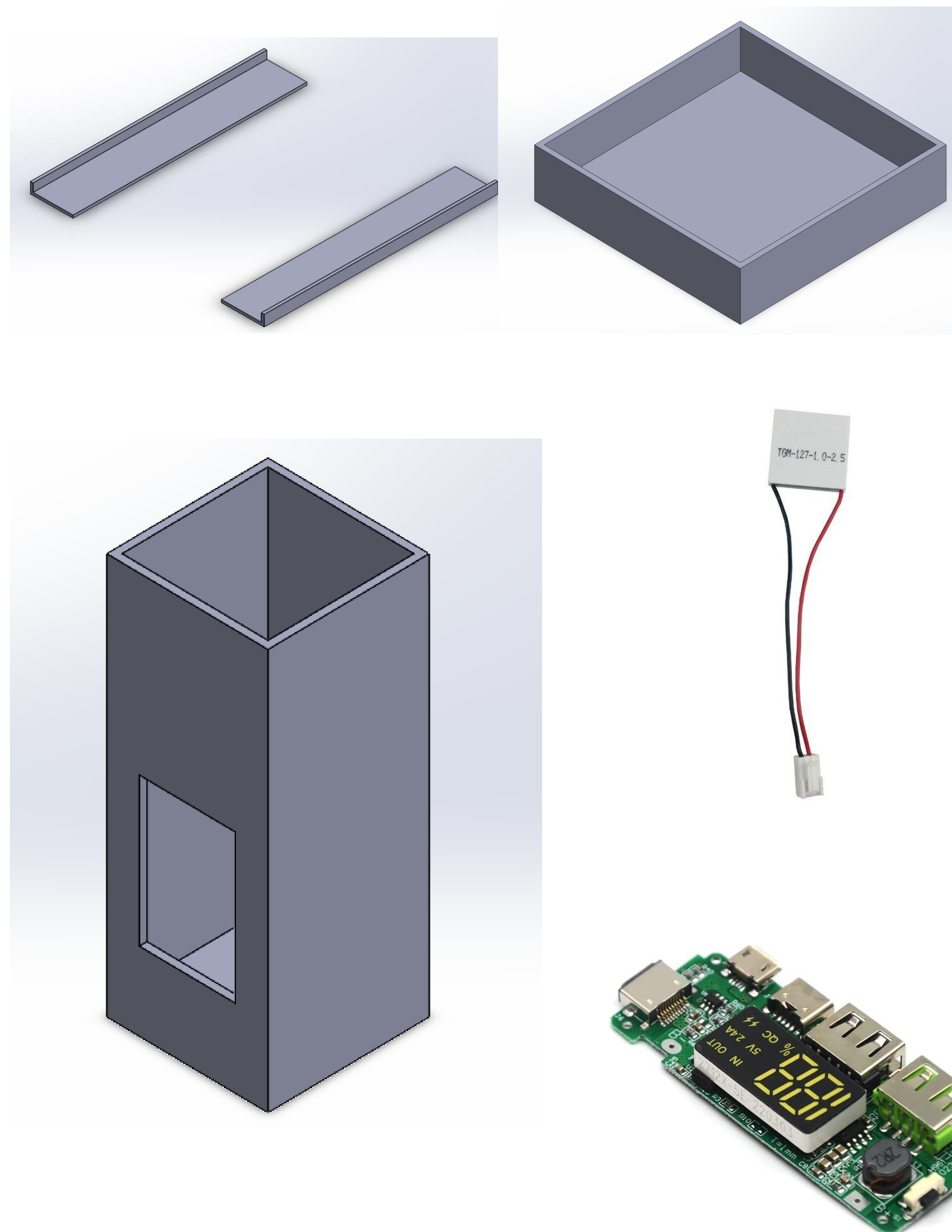
## Piezoelectric Effect

1. "Piezo" means "squeeze"
2. By deforming a crystal such as Bismuth Telluride the perfect crystalline structure gets disturbed and tries to correct itself. This creates a thermal output.
3. By applying a heat source to a single side of the crystal the crystalline structure is forced out of its perfect structure and creates an electrical output.
4. This electrical output is DC (direct current) voltage which is what charges our phones

## Design Layout

### Design AIMS

1. Make a small, portable device using a Thermoelectric Generator Chip or (TEG Chip) to produce an electrical DC output, using the naturally occurring temperature difference within camping scenarios.
2. This design must be small, light in weight. Create enough power to charge a device (5 volts) from common temperature differences.



Thermoelectric Generator components: Housing, TEG chips, OverCharge Protector

## Future Design and Goals

- Make device with more charging port options- be able to charge a wide variety of device with multiple adapters available
- Have a longer battery life while still be small and portable- find areas to put larger battery or more batteries into the device.
- Faster charge - does adding more chips result in a faster charge that is relevant
- More portable, possibly all fabric, with flexible chips, could be rolled up

## Conclusion

- ❖ The Thermoelectric Generator Chip takes up less space and is more consistent than Wind Turbines, Hydroelectric Turbines and Solar Panels due to there always being a temperature change present.
- ❖ This design works well in any weather conditions.
- ❖ The portability of this design makes it a great option for backpackers.

## References

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