

Student Guide: What Makes Different Types of Batteries Unique?

Directions: Your group should take ownership of one battery type. Using the resources recommended by your teacher, find the following information for your battery (elaborate in areas where a lot of information is accessible) and summarize your findings according to your teacher's instructions.

Please be sure to include the following information:

1. Type of battery
2. Is it a primary or secondary cell (one time use or rechargeable)?
3. What is the overall redox reaction?
4. What gets oxidized (oxidation half reaction) and what gets reduced (reduction half reaction)?
5. What is the common electrolyte/ionic compound (to neutralize charge buildup)?
6. What is the voltage per cell?
7. What is the overall battery voltage, and how many cells are required to produce that voltage?
8. What is the maximum energy density in Joules per kilogram (and/or milliliter) for this electrochemical reaction? For reference, how does that compare to the energy density in Joules per kilogram (and/or milliliter) for gasoline?
9. What are the advantages of this battery type, and what aspects of the electrochemistry and battery design give it those advantages?
10. What are the disadvantages of this battery type, and what aspects of the electrochemistry and battery design give it those disadvantages?
11. What are the major applications of this battery type, and what aspects of the electrochemistry and battery design make it suitable for those applications?
12. What are the environmental concerns for the use and/or for the disposal of your battery type?
13. What is the best method of disposal for your battery type? Can it be recycled and, if so, how?
14. When and where was this battery type first developed?
15. What characteristics of this battery type could be improved, and what changes in the electrochemistry or the battery design might yield those improvements?