

Name:

Date:

Class:

Pre-Activity Discussion Questions **Answers**

- 1) What gives power to your cell phone?
 - Answer: battery
- 2) What happens when you 'discharge' a battery?
 - Answer: When a battery discharges, leads that connect to the battery allow current to flow from the battery to the device that you want to charge.
- 3) How are batteries used today?
 - Answer: Various answers include: power cell phones, iPads, portable electronics.
- 4) Are there different kinds of batteries? If so, give some examples.
 - Answer: Yes, AA, AAA, C, D, 9 volt, lithium polymer, silver oxide
- 5) What do you think are the differences between these types of batteries?
 - Primary and secondary cells = primary batteries cannot be recharged (most AA, AAA, C, etc.) and secondary batteries can be recharged (lithium, etc. in cell phones and iPads)
 - Each type of battery whether primary or secondary may also have different active materials that react together to produce electricity, i.e. Alkaline, Acidic, Lithium, etc. activities.
- 6) What are the differences between AA, AAA, etc. types of cells as shown in Figure 1?
 - Answer: Some of the cells are primary and some are secondary. They are in different kinds of configuration and have different active materials.

Note: Some students may ask why primary cells cannot be recharged as secondary batteries.

Answer: The reason why primary batteries cannot be recharged is because they are multifaceted. Some explanations are provided below.

1. In some primary cells, the chemical reaction causes gas evolution, which requires a lot of input energy to force the chemical reaction to go the reverse direction. Secondary cells often get around this by including catalysts to assist the reaction in the opposite direction.
2. Sometimes there is a physical change in the reactants in the cell, like in the standard Leclanché cell, which is made with an outer shell of zinc. As the cell discharges, parts of the shell are dissolved, which eventually produces holes. Reversing the current flow will cause zinc to redeposit, *but not necessarily filling in the weakened areas*. Also, some cells are unable to work in reverse because there is a buildup of large, insoluble crystals can accumulate on the surfaces of the electrode during the chemical reaction, thereby preventing reversal of the chemical reaction during charging.