

"What Type of Batteries Are Best?"

Problem and Purpose:

What type of AA batteries (Standard, Heavy Duty, Alkaline, or Rechargeable Ni-Cad) batteries will last the longest?

Hypothesis:

Alkaline batteries will probably last the longest.

Description of Materials:

2 - New AA Standard Battery
2 - New AA Heavy Duty Battery
2 - New AA Alkaline Battery
2 - New AA Rechargeable Ni-Cad Battery 1 - Charger for AA rechargeable batteries
1 - Erector set motor and propeller 1 - Battery operated clock
1 - Battery holder
1 - Wire

Procedure:

Experiment:

One battery of each type will be connected to the motor and clock until the motor and clock stop. The clock will be set at 12:00 initially, the time that the clock stops will be recorded.

The test will be repeated with the same type of battery. An average of the two times will also be recorded.

This procedure will be repeated with all four types of batteries. The rechargeable batteries will be fully charged prior to the test.

The batteries will be tested in a random order. They will be selected from a paper bag with my eyes closed.

Batteries:

A battery is used to store electricity. Electricity flows when a battery is connected to an object like a watch, toy, or flashlight. A battery is also known as a cell.

Primary and secondary are how batteries are grouped. Primary batteries include zinc-carbon and alkaline and can't be recharged easily. Secondary batteries include nickel-cadmium which are used in small electronic items. This battery is a storage one.

There are many sizes and types of batteries. Some are stronger than others. No battery is perfect. Your choice depends on what you will be using it in.

Different types of AA batteries were tested to find out which one lasted the longest with a flashlight or a motor. My hypothesis was that the alkaline AA batteries would be best. I was correct. The experiment showed that the alkaline AA batteries lasted the longest with the flashlight, 215 minutes; or the motor, 2033 minutes, compared to the other types of batteries tested (general purpose, heavy duty, and rechargeable nickel-cadmium).

The rechargeable nickel-cadmium batteries cost the most but may cost less over the long term

since they may be recharged and reused.

Future experiments recommended would compare different brands of alkaline batteries, comparing different types of rechargeable batteries, or comparing a recharged old nickel-cadmium battery with a charged new nickel-cadmium battery.

Experiment

One new AA battery will be placed in the flashlight and turned on. The time will be written down when the light turns on and when it turns off by itself. The length of time that the battery lasts will be determined. The test will be repeated for all four types of batteries. The test will be repeated again with a second new battery of each type.

One new AA battery will be placed in the battery holder connected to the erector set motor and turned on. The time will be written down when the motor turns on and when it stops by itself. The length of time that the battery lasts will be determined. The test will be repeated for all four types of batteries. The test will be repeated for a second new battery of each type.

Rechargeable batteries will be fully charged for 12 hours prior to the test.

Flashlight ,Test 1:

The general purpose battery lasted 33 minutes, heavy duty, 52 minutes, alkaline, 211 minutes, and the rechargeable 68 minutes.

Flashlight, Test 2:

The general purpose battery lasted 32 minutes, heavy duty, 51 minutes, alkaline 218 minutes, and the rechargeable 68 minutes.

Motor, Test 3:

The general purpose battery lasted 587 minutes, heavy duty, 715 minutes, and alkaline 2034 minutes.

Motor, Test 4:

The general purpose battery lasted 625 minutes, the heavy duty 736 minutes, and the alkaline 2032 minutes.

Experiment Conclusion

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The rechargeable nickel-cadmium batteries cost the most, but may cost less long term to use since they may be recharged and reused.

Future experiments recommended would compare different brands of alkaline batteries, comparing different types of rechargeable batteries, or comparing a recharged old nickel-cadmium battery with a charged new nickel-cadmium battery.