



Mission Folder Score Range – 101-200

Team Collaboration

How was your team formed? Was your team assigned or did you choose to work with each other?

We chose to work with each other.

Provide a detailed description of each team member's responsibilities and jobs during your work on the Mission Folder.

Student 1 did all the experimentation and typing while Student 2 put together the board. Student 3 did absolutely nothing.

Did your team face any problems working together? If so, how did you solve them? If not, why do you think you were able to work together so well?

There were no problems we got all the work done because we are good friends.

What were some possible advantages to working together as a team on this project? How would working as individuals have made this project more difficult?

We were able to work on multiple parts at the same time and get more done. Working individually would have slowed down progress.

Use of Engineering Design

What problem in your community will your team attempt to solve using the engineering design process?

We are trying to figure out which phone (iPhone and Samsung) would charge faster using a 9 volt battery in a situation with no power. We connected a pen spring to a car plug and the other end to the 9v battery.

Research your problem. You must learn more about the problem you are trying to solve and also what possible solutions already exist. Find AT LEAST 10 different resources and list them here. They should include books, periodicals (magazines, journals, etc.), websites, experts, and any other resources you can think of. Be specific when listing them, and do not list your search engine (Google, etc.) as a resource.

<https://electronics.howstuffworks.com/everyday-tech/battery2.htm> <http://www.Physicsforums.com>

<http://Van.physics.illinois.edu>

<http://www.Engineeringtoolbox.com>

Explain what you learned from your research. What did you find out about your problem that you didn't know before? What kinds of possible solutions already exist? Be sure to put this in your OWN words, do not just copy and paste information. Also, be sure to cite your sources.

We learned that Samsung phones charge faster than an i-phone using the 9v charging method. One easy solution to this problem is to buy a Samsung phone rather than a i-phone.

What MUST be a part of your solution? This is called the criteria. What does your solution need to have in order to solve the problem? (NOTE: Don't discuss a specific solution here, just the characteristics of a good solution).

We need the results of the 3 trials and to see which phone has the better battery over the other.

What limits are there on your solution? These are called constraints. Does it need to be a certain size? A certain weight? Is the cost a factor? Write down all of the limits on your solution.

The limits on my solution are the amount of products we can use to test our solution, since we are limited to 2 phones. there is no certain size the phones have to be, the main limit is the amount of energy which phone can hold more than the other.

Based on your criteria and constraints, what is your proposed solution to the problem you chose? Explain what it will look like and how it will work. If you can, include a detailed, labeled drawing.

Our proposed solution is to experiment which phone battery charges faster over the other, the Samsung or the iPhone. it will work by putting each phone on a charger until one of them reach 10 percent first and seeing which phone charges faster.

How will you test your solution? The BEST way to test your solution is to build a working model or a prototype that you can actually use. Or you can guess how your solution will work BASED ON your research. Which method will you use and why?

We will test our solution by getting

1. 2 9v batteries, 2 pen springs, 2 charging cables, 2 car chargers, and an iPhone and a Samsung.?
2. Connect the pen springs to the 9v socket and connect the car charger to the corresponding socket. (Due for both batteries)?
3. Connect the pen spring to one of the little metal arches on the side of the car charger. (Due for both)?
4. Connect the charging cable to the car charger. (Due for both)?
5. Plug both phones into their charging cables and record the time it takes to charge both phones to 10%.?

If you built a prototype or model, explain how you built your prototype or model, step-by-step including all safety precautions. If you guessed how your solution would work BASED ON your research, explain important information from your research that you used to prove how your solution would work and be sure to cite your sources.

1. We got 2 9v batteries, 2 pen springs, 2 charging cables, 2 car chargers, and an iPhone and a Samsung.
2. We connected the pen springs to the 9v battery socket and connected the car charger to the corresponding socket.
3. Finally, both of us connected the charging cable to the car charger which we did for both phones.

Explain how you tested your prototype or model. Be sure to include every step of your testing including all safety



precautions that were taken. If not stated it will be assumed no safety precautions were taken. If you are using research to guess how your solution will work, explain step-by-step how it will work and why.

We tested our model by charging both phones at the same time and observing which phone will get to 10 percent of battery first. Then, we wrote down our observations on a notebook and turned our results into a graph on powerpoint and made a table to show another way of displaying our results.

What problems did you find with your solution? Be specific since you will need to redesign based on these problems.

We did not find any problems in our solution.

Describe all of the changes you made to your prototype or model (or proposed prototype) after your first test. Why will these changes improve your solution?

We did not alter our model in any way.

Present the data you collected from your tests or from your research. If you tested a prototype or model then include all of the numbers you gathered during your testing and all observations you made. Use of graphs and charts is HIGHLY encouraged. If you used research to prove how your solution would work, be sure to include all of the numbers, charts, and graphs you used to make your case.

The Samsung charged faster than the iPhone. The times were close to each other but through 3 trials Samsung charged faster. Samsung's charge times were 27:42, 27:23, and 28:43. The iPhone's were 30:31, 29:50, and 30:25..

What are your potential sources of error? Remember, this doesn't mean "Did everything work?", all tests have potential sources of error, so make sure you understand what that means. Explain how these sources of error could have affected your results.

One of our sources of error was the construction of the charger. The process was very difficult and a tedious process.

What conclusions can you draw based on the data you gathered during your tests?

We concluded that the Samsung has a better battery because the Samsung has a more efficient charging rate than the iPhone.

Benefit to the Community

Explain how investigating the problem your team chose will help the community. Be sure to include the impacts your research will have on individuals, businesses, organizations, and the environment in your community (if any). Make it very clear why solving this problem would help your community.

The problem we chose to investigate will help people who need to use their phone in an emergency situation but don't have any phone battery. What we did was see which phone would be a better phone to charge fastest using a 9v battery. So if you're in an emergency situation you will know which phone would be a quicker one to charge if you need to make an emergency call or etc.



Abstract

The purpose of this experiment was to find out which battery charged faster, the Samsung battery or the iPhone battery. First and foremost, we obtained 2 9v batteries, 2 pen springs, an iPhone and Samsung charging cable. For the experiment we used an iPhone and a Samsung phone. Secondly, we connected the pen springs to the 9v battery arch. Next, we connected the phone chargers to the car plugs USB connector. Then, we connected the car plug and pen spring to the 9v battery's terminals (positive/negative). Finally, we plugged in both phones and recorded how long it took for each phone to charge to 10 percent. We then recorded the time in our notebooks and translated the information into a data table. In our hypothesis, we predicted that the Samsung would charge faster than the iPhone. For the first trial we conducted the experiment and the Samsung phone beat the iPhone by a few minutes. The Samsung took 27 minutes and 42 seconds to charge to 10 percent, while the iPhone took 30 minutes and 31 seconds to charge. For the second trial of the experiment, the Samsung took first place again, beating the iPhone. The Samsung's time was 27 mins and 23 seconds while the iPhone's time was 29 mins and 50 seconds. For the third and final trial, the Samsung once again beat the iPhone by a few minutes. The time it took for the Samsung to charge was 28 mins and 43 seconds while the iPhone lost by less than 3 mins with a time of 30 mins and 25 seconds. In conclusion, the Samsung charged quicker than the iPhone. Our results show that it came in first every time because the Samsung has a bigger and more efficient battery than the iPhone. The reason why we predicted that the Samsung would charge faster than the iPhone is based on how the phones were created for use. The Samsung was created more for work, with better and faster hardware which is why the Samsung will charge faster than its competitor, the iPhone. Unlike the Samsung, the iPhone, although functional, was created with lots of bells and whistles but remains more a status symbol.

Attachments

Title: Powerpoint with pictures

Description: evidence for project

Hypothesis

If the Samsung has a better battery than the iPhone, then the Samsung phone will charge faster.

Problem statement

Which phone can charge fastest to 10%
using the 9V charging method?
iPhone or Samsung?

Materials list

- Two 9v batteries.
- Two pen springs.
- Two car chargers.
- An iPhone charger.
- A Samsung Charger.
- One iPhone.
- One Samsung phone.

Variables

Manipulated variable:

The phone batteries that are going to be charged.

Responding variable:

The variable is time because as the phone batteries charge the time changes.

Control Variables:

The time it takes to charge in a normal outlet.

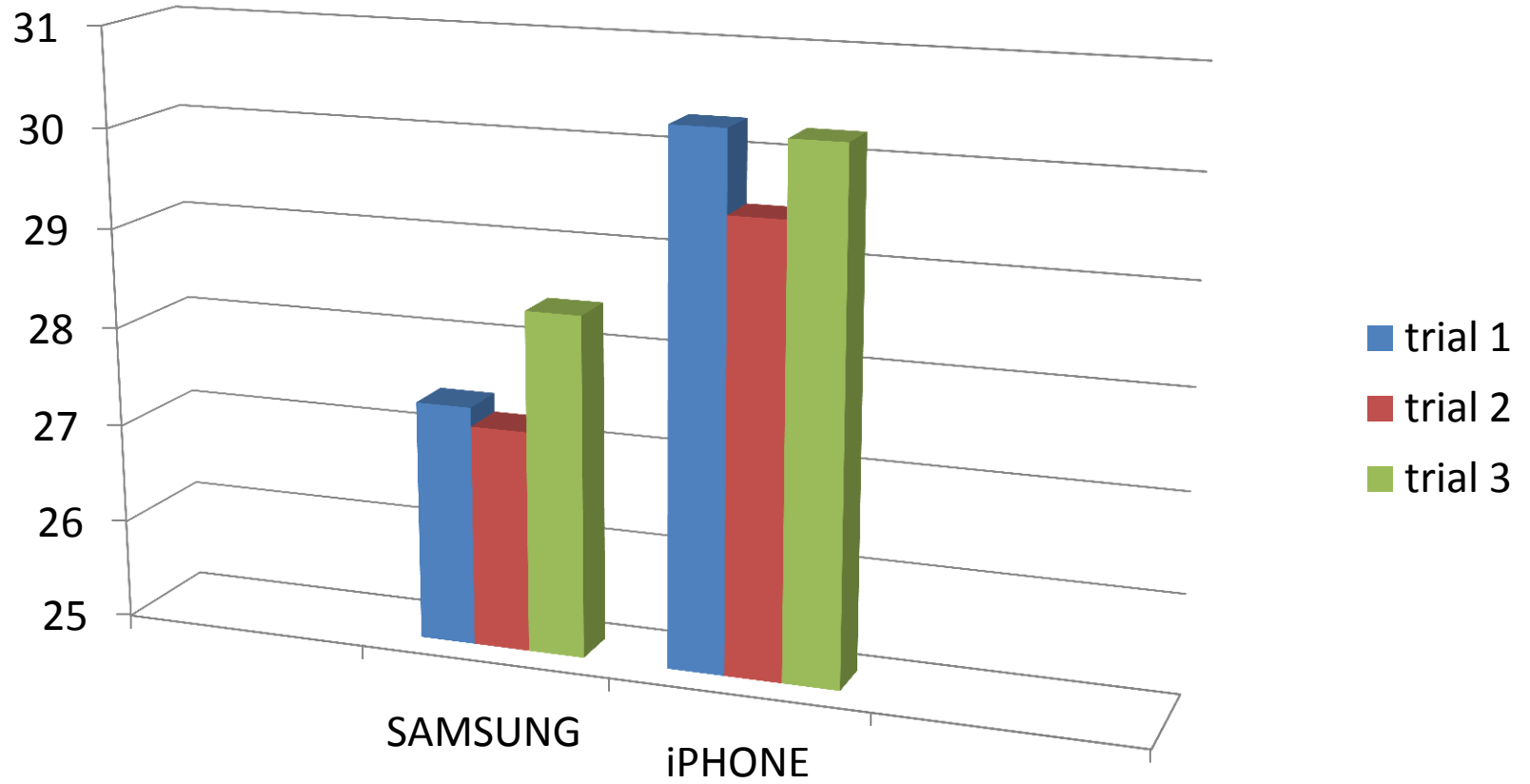
Constant:

The same battery, the percentage at the beginning and at the end, same equipment, and the same age phone.

Procedures

1. Get 2 9v batteries, 2 pen springs, 2 charging cables, 2 car chargers, an iPhone and a Samsung.
2. Connect the pen springs to the 9v socket and connect the car charger to the corresponding socket .(do it for both batteries)
3. Connect the pen spring to one of the little metal arches on the side of the car charger. (do for both)
4. Connect the charging cable to the car charger. (do for both)
5. Plug both phones into their charging cables and record the time it takes to charge both phones to 10%.

Data



Results

The Samsung charged faster than the iPhone. The times were close to each other but through 3 trials Samsung charged faster. Samsung's charge times were 27:42, 27:23, and 28:43. The iPhone's were 30:31, 29:50, and 30:25.

Conclusion

In conclusion, the Samsung charged faster than the iPhone. The times were close to each other but through 3 trials Samsung charged faster. Samsung's charge times were 27:42, 27:23, and 28:43. The iPhone's were 30:31, 29:50, and 30:25..

Application

The importance and significance of this science fair project is to show that in a case of an emergency when there is no electricity this can be an easy way to charge your phone with easy to find materials. The reason we tried to see which phone charged faster was to put ourselves in a situation in which you needed to charge your phone without electricity and find which phone was more efficient and faster, because if you're ever in an emergency situation the faster charging phone could potentially save your life.

Abstract

- The purpose of this experiment was to find out which battery charged faster, the Samsung battery or the iPhone battery. First and foremost, we obtained 2 9v batteries, 2 pen springs, an iPhone and Samsung charging cable. For the experiment we used an iPhone and a Samsung phone. Secondly, we connected the pen springs to the 9v battery arch. Next, we connected the phone chargers to the car plugs USB connector. Then, we connected the car plug and pen spring to the 9v battery's terminals(positive/negative). Finally, we plugged in both phones and recorded how long it took for each phone to charge to 10 percent. We then recorded the time in our notebooks and translated the information into a data table. In our hypothesis, we predicted that the Samsung would charge faster than the iPhone.
- For the first trial we conducted the experiment and the Samsung phone beat the iPhone by a few minutes. The Samsung took 27 minutes and 42 seconds to charge to 10 percent, while the iPhone took 30 minutes and 31 seconds to charge.
- For the second trial of the experiment, the Samsung took first place again, beating the iPhone. The Samsung's time was 27 mins and 23 seconds while the iPhone's time was 29 mins and 50 seconds.
- For the third and final trial, the Samsung once again beat the iPhone by a few minutes. The time it took for the Samsung to charge was 28 mins and 43 seconds while the iPhone lost by less than 3 mins with a time of 30 mins and 25 seconds.
- In conclusion, the Samsung charged quicker than the iPhone. Our results show that it came in first every time because the Samsung has a bigger and more efficient battery than the iPhone. The reason why we predicted that the Samsung would charge faster than the iPhone is based on how the phones were created for use. The Samsung was created more for work, with better and faster hardware which is why the Samsung will charge faster than its competitor, the iPhone. Unlike the Samsung, the iPhone, although functional, was created with lots of bells and whistles but remains more of a status symbol.

Bibliography

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