Fruity Battery Investigation

You are currently a scientific researcher working for a major mobile phone company. The company has asked you to investigate the possibility of moving away from lithium batteries and using an environmentally friendly alternative such as citrus fruit.

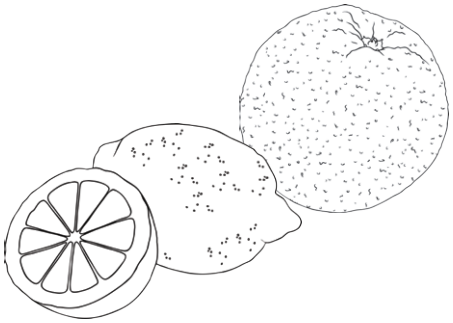
Your boss has told you that the average mobile phone needs **4V** to charge it.

In groups, you are going to carry out an investigation to see which citrus fruits would make the best battery to power a mobile phone.

What are the variables in this investigation?

Independent Variable	
Dependent Variable	
Control Variable	

Construct a table to record your results.



Prediction

Which fruit do you think will produce the most electricity and why?

Conclusion

Which citrus fruit created the biggest voltage? What evidence do you have to support your answer?

Why don't we use fruit instead of batteries?

Did you find any anomalous results?

How do you know the result(s) were anomalous?

Evaluation

How could we improve the investigation for next time?

Questions

1. Batteries store chemical energy, but what is it transformed into?

2. Describe what voltage is.

3. Describe what current is.

4. Use the data that you have gathered from your investigation. Will fruit be able to charge a 4V mobile phone? In your explanation, you should include the following **keywords:** voltage, current and electrodes.

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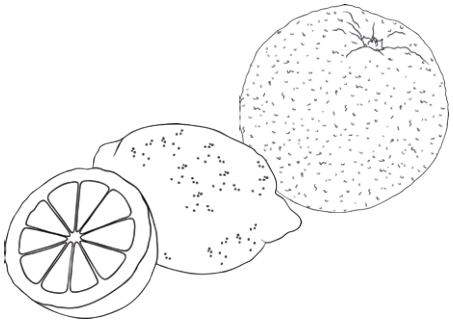
In groups, you are going to carry out an investigation to see which citrus fruits would make the best battery to power a mobile phone.

What are the variables in this investigation?

Independent Variable	**fruit**
Dependent Variable	**voltage**
Control Variable	**equipment, method**

Construct a table to record your results.



Prediction

Which fruit do you think will produce the most electricity and why?

Students will have their own answers.

Conclusion

Which citrus fruit created the biggest voltage? What evidence do you have to support your answer?

Students will have their own answers.

Why don't we use fruit instead of batteries?

Students' answers may vary. Fruit batteries are unreliable and cannot maintain powering a device over a long period of time. This would not be useful to the customer who may need their mobile phone for long journeys.

Did you find any anomalous results?

Students will have their own answers.

How do you know the result(s) were anomalous?

Students will have their own answers.

Evaluation

How could we improve the investigation for next time?

Students' answers may vary. If students carried out the experiment only once, then next time they should carry it out three times in total. This will allow students to calculate an average. Students should compare their results with other groups in the class to see if they have a similar pattern.

Questions

1. Batteries store chemical energy, but what is it transformed into?

   electrical energy

2. Describe what voltage is.

   The voltage of a battery tells us how much energy it provides to the components in the circuit. It tells us how hard a battery pushes the electrons in a circuit - the bigger the voltage, the bigger the push. The strength of the push provided by the battery is called the voltage.

3. Describe what current is.

   Current is the flow of charge around a circuit. The faster the charge flows, the higher the current. Current is measured in amps using an ammeter.

4. Use the data that you have gathered from your investigation. Will fruit be able to charge a 4V mobile phone? In your explanation, you should include the following **keywords:** voltage, current and electrodes.
   Students will have their own answers as to whether their fruit was able to reach 4V, but they should have included the keywords.