

Electricity and Dynamo Jan. 11, 2024

What is **Dynamo?** and Dynamo?

"Dynamo is an electrical generator that utilizes a commutator to generate direct current. **Dynamo converts mechanical energy into electrical energy.**"

- **BYJUS.COM**

What is **electricity?**

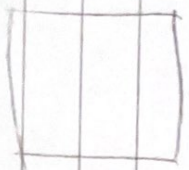
"**Electricity is a flow of electrons and protons.** It can also mean the energy you get when electrons flow from place to place."

- **Brittanica Kids**

Jan. 11. 2024 Materials Needed

- Wheels
- Cardboard
- Drive belt
- Motor
- Wires
- Light bulb

Our Program's Project



Web Websites

- Britannica Kids
- Kidzearch
- BYJU'S
- Google Chrome

Jan. 11 2024

Research Jan. 12. 2024

Sources Jan 12 2024

ENERGY

• "Energy is the ability to do work/move."

Our main source of energy is the Sun!

Energy is split into 6 basic groups.

- Study.com

- Britannica Kids Sections of Energy

Chemical Energy

It is energy that is stored

in the bonds between

atom and molecules.

Radiation energy

Radiation energy can

be transmitted through

electromagnetic radiation.

- HRF

Thermal Energy is

Produced when a rise in

Temp causes atoms and

molecules to move faster

and creates heat

- Google

Electrical Energy

It is energy that we use

to power lights, TVs,

computers, fridges & ovens

Mechanical Energy

It is all the energy that

an object has because of

its motion and its position

All living things and machines

use it for work, - Britannica Kids

Kinetic Energy

It is the energy of motion

of an object. It is the energy that

allows an object to move

your car

- Google

(for research)

- Britannica Kids

- Google

- Twinkl

- healthresearchfunding.org

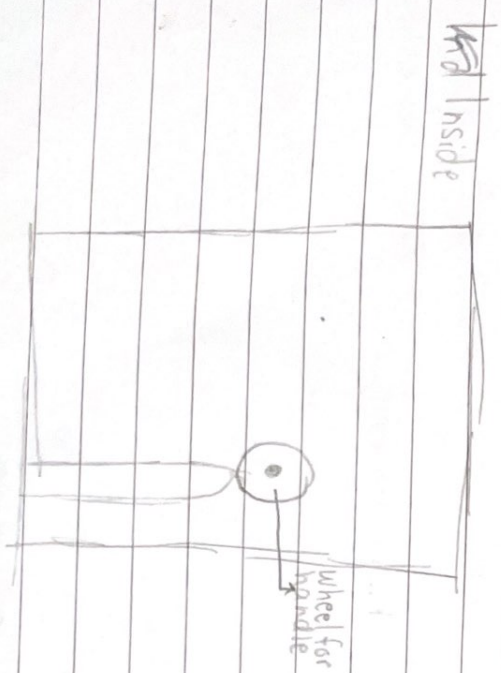
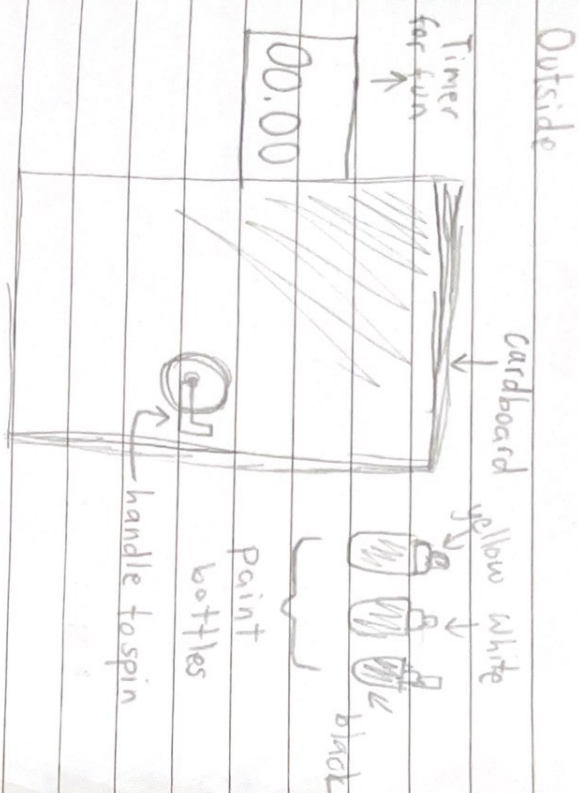
- Study.com

Kinetic energy

the energy an object has because of its motion

- Khan Academy

Cancelled on Jan. 13, 2024
 Diagram of the project: Jan. 12, 2024



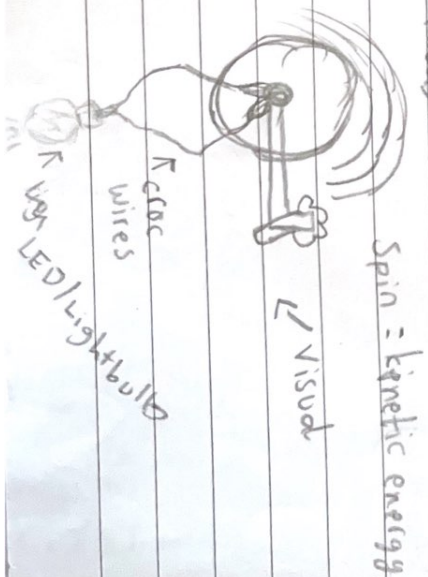
Kinetic Energy Jan. 13, 2024

Kinetic Energy is an energy an object has because of its motion.

If we want to accelerate on object, then we must apply a force. Applying a force requires us to do work. After work has been done, energy has been transferred to the object, and the object will be moving with a new constant speed. The energy transferred is known as kinetic energy, and it depends on the mass and speed achieved.

~~Wish Academy~~ BYJU'S.COM

Ideas:



?? ? Websites

Jan. 13, 2024

- Khan Academy
- ~~RAVENNA~~
- BYJU'S.COM
- <https://www.eia.gov>
- <https://education.jlab.org>
- typeset.io

~~Battery~~

Kinetic Energy Jan. 13, 2024

How can kinetic energy convert into electrical energy? The generator converts kinetic energy to electrical energy

Kinetic energy is the energy of motion. It can be converted into electrical energy.

Does a dynamo use kinetic energy?

The advantages of using a dynamo to generate electricity include harnessing kinetic energy and converting it into electrical energy.

How does kinetic energy work with magnets? ~~RAVENNA~~ - typeset.io

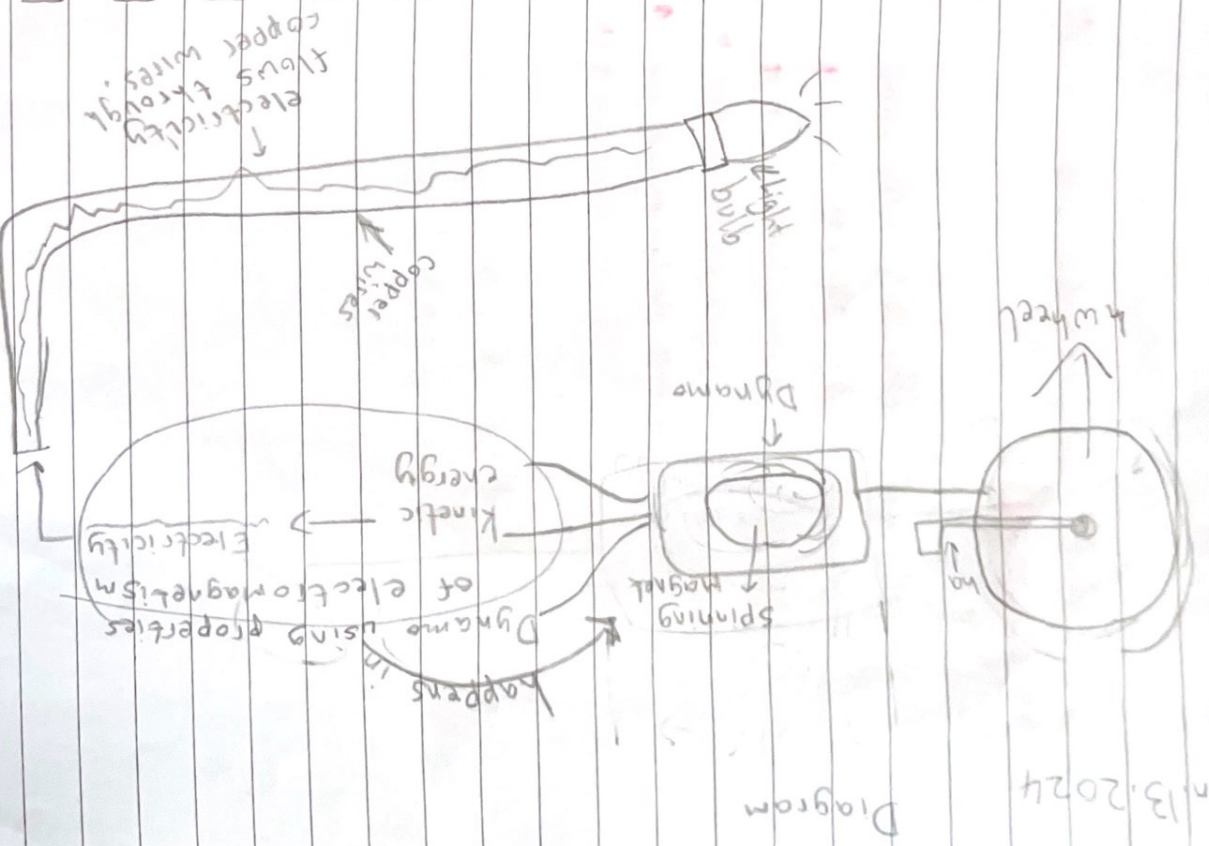
When you rotate a magnet, you are using kinetic energy to move it.

- <https://education.jlab.org>

Kinetic Energy

Jan. 13, 2024

When you spin the wheel, the magnet in the DYNAMO will rotate which creates kinetic energy. Using the properties of electromagnetism, it will convert the kinetic energy to electrical energy. Then, the electrical energy, also known as electricity, will flow through the copper and light the lightbulb up.



Experiment Jan. 13, 2024

Experiment: How different sizes of LED lights need different energy levels.

Variables: Copper wires
Lightbulbs
Spinning Wheel
Dynamometer
Voltmeter - measures electricity voltage = CV
Force

Controlled variable
Manipulative variable
Controlled variable
Controlled variable
Manipulative variable

Hypothesis: If the lights were bigger, then it will more force because we need more electricity

Under the topic of Physical Science & Chemical Science

Date Jan. 13, 2024

Day, Date, Time, Force level, Electricity Flow, Results

Day	Date	Time	Force level	Electricity Flow	Results
					A B C

Analyze

Conclusion

Fun Facts

Jan, 13, 2024

- Did you know that

Who discovered the kinetic energy concept?

Michael Faraday, 1831

- Quizlet.com

How can people use kinetic energy in everyday life?

• In a windmill, when the moving air hits the blades, it causes rotation which ultimately leads to the generation of electricity.

• In a hydropower plant, when the kinetic energy of the moving water hits the turbine the kinetic energy of the water gets converted to mechanical energy. Then, the mechanical energy is transformed into electrical energy.

- BYJUUS.COM

Procedure Jan. 13, 2024

1. Connect the spinning wheel to the voltmeter using copper wires

2. Connect the spinning wheel to the dynamo using copper wires

3. Connect the dynamo to Light Bulb A using copper wires

4. Spin the spinning wheel

5. Check the voltmeter for the voltage or the electricity flow

6. Observe the light bulb

7. Record the observations

8. If the light bulb doesn't light up, spin the wheel faster

9. Make sure the reading on the voltmeter is higher

10. Continue steps 8 and 9 until Light Bulb A lights up

11. Once it lights up, switch Light Bulb A to Light Bulb B

12. Repeat steps 4-10

13. Repeat steps 11-12 for Light Bulb C

Jan. 17. 2024 things to get done

next week

- Sources of ~~the~~ Error ✓
- Have only one manipulative variables ✓

Jan. 18. 2024

one | can only have one
manipulative variable, so I'm having 3
experiments

Exp 1 -> 4 Light bulb A

Exp 2 -> Light Bulb B

Exp 3 -> Light Bulb C

Changed variables

Copper wires - controlled

light bulbs - controlled -> responsive

dynamometer - controlled

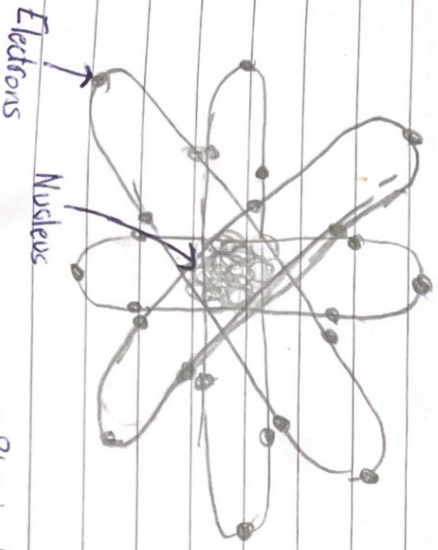
voltmeter - controlled

force - manipulative

Jan. 19, 2024

Electricity

"Electricity is energy that powers our cities, homes and school. Electricity is a form of energy that can build up in one place to another. Electricity begins with atoms. These tiny particles are the building blocks of everything in the universe. Zoom in on an atom ~~and~~ and you'll find ELECTRONS orbiting around its center, or nucleus. Electrons have a negative charge. It is the charge that creates electricity."



- Physical
Science Electricity
and Magnetism book

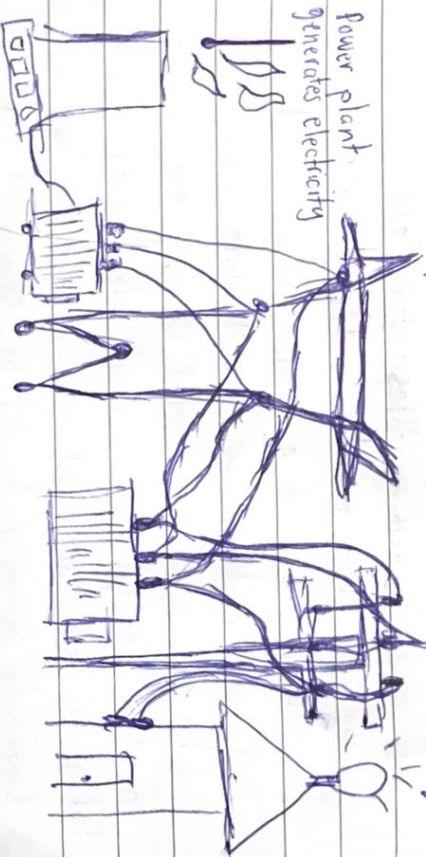
Jan. 19, 2024

Electricity

"Electricity needs a buildup of negative charges in order to work. That means it needs a lot of loose electrons. Electrons are knocked free when energy is added to the atoms. Objects that have opposite charges attract. As a result, positive charges on nearby atoms pull freed electrons toward them. This movement of electrons from one atom to another creates electricity."

Physical Science Book
Power supply and gas

Power lines transport electricity hundreds of miles from power plants to your home.



Jan. 19, 2024

What are conductors?

Sources Jan. 19, 2024

- Physical Science Book - Scholastic

"Metals are good conductors. Why though?"

Electrons can break away from metal

atoms without difficulty. Conductors can

flow electricity easily to create energy.

The loose electrons are free to move through

the material. For this reason, wires in

electrical cords and circuits are made from

metal." Physical Science Book

Battery Pack

"Batteries have a positive (+) end and a

negative (-) end. Different sizes supply

different levels of current. Batteries are

like tiny portable power plants that help

you charge something. Alessandro Volta

created the first modern battery 1800.

He stacked plates of zinc and silver, with

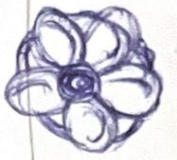
salt water soaked paper in each plate. The

metals and saltwater reacted, allowing electrons

to flow through the to create electricity

Today, batteries are found in countless devices,

from cell phones to flashlight." Physical Science



Jan. 19, 2024

Magnetism

"Magnets are not sticky like glue or tape, yet they can hold ~~scribes~~ tight to certain objects. Magnets can ~~hold~~ also move some materials without even touching them. There's nothing really magical about magnets though. Science can explain their strange & powers! Magnets push and pull on objects because they give off an invisible force. This force is called magnetism. Magnets can only be made of certain metals, such as iron, cobalt or nickel. And they only interact with these same metals. A magnet will not attract objects made out of glass, plastic, or wood." Physical Science Book

Jan. 19, 2024

How magnets work

Just like electricity, magnetism comes from electrons. In addition to their electric charge, these particles act like teeny-weeny magnets. The atoms in most materials are arranged so their electrons' magnetism pulls in different directions. As a result, their forces cancel one another out and the materials does not act like

28.01.2024

How to Light a

Lightbulb?

Experiment 1

Materials:

One wire

One 1.5V battery (AA Battery)

One LED Light

How can you light a lightbulb up with these materials?

First, to flow electricity I need a closed circuit. Things I need in a closed circuit are:

1. Source of energy
2. Conductors

for?

What is an ammeter used

Jan. 28. 2024

An ammeter is used to measure the current.

Observations

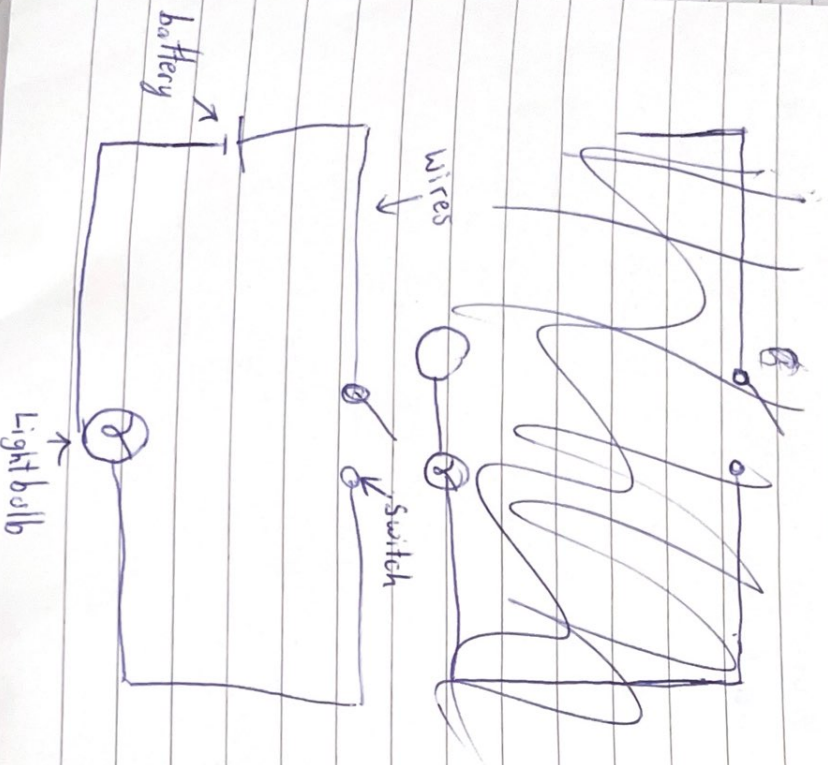
To have a closed circuit, I need:

- Source of energy
- Conductors

Jan, 28, 2024

Here's the plan:

I need a closed circuit. So, I need a source of energy. Instead of using batteries I will use kinetic energy. Today, ~~used~~ I created a circuit:



Jan. 28. 2024

Instead of using batteries, I ~~will use~~ changed it to a ~~hand crank~~ ~~energy~~ spinning wheel.

The spinning wheel is a hand cranker that is connected to the motor/dynamo.

I spy spinned the hand cranker to light the light bulb. The light bulb ~~has~~ ~~require~~ needs 0.2A of current to light up.

• When I spinned it, it did not light up the first time ~~because~~ ~~spinned~~ ~~it~~ ~~slowly~~

• I checked if everything was connected properly.

• I changed the hand cranker ~~or~~ into a battery to see if the circuit works. To make sure the wires and bulb is not ~~at~~ the sources of error.

• Then the light bulb lit up.

Jan. 28, 2024

This means that the ~~source~~ wires and light bulb ~~is not~~ are not the sources of error.

• This means that the hand ~~to~~ cranks ~~is~~ is the source of error.

• So, I checked if the motor and the hand ~~to~~ cranks ~~is~~ were connected properly.

• It turned out that it wasn't. So, I connected the motor ~~to~~ and the hand cranks ~~is~~ properly.

• ~~changed~~ So, I reconnected the hand ~~to~~ cranks ~~is~~ to the ~~to~~ circuit again by changing ~~from~~ the battery with ~~to~~ the hand cranks ~~is~~.

Jan. 28, 2024

• Then, I spinned the hand ~~to~~ cranks ~~is~~ but it still didn't light up.

• So, I spinned it faster and faster until ~~to~~ the light bulb lights up.

• Then, the light bulb lit up.

• What I learned from this is that, you need enough energy to light ~~to~~ the light bulb up.

• The energy comes from me spinning the hand cranks ~~is~~. So, that means, I need to spin the hand cranks ~~is~~ faster to create enough energy to light the light bulb up.

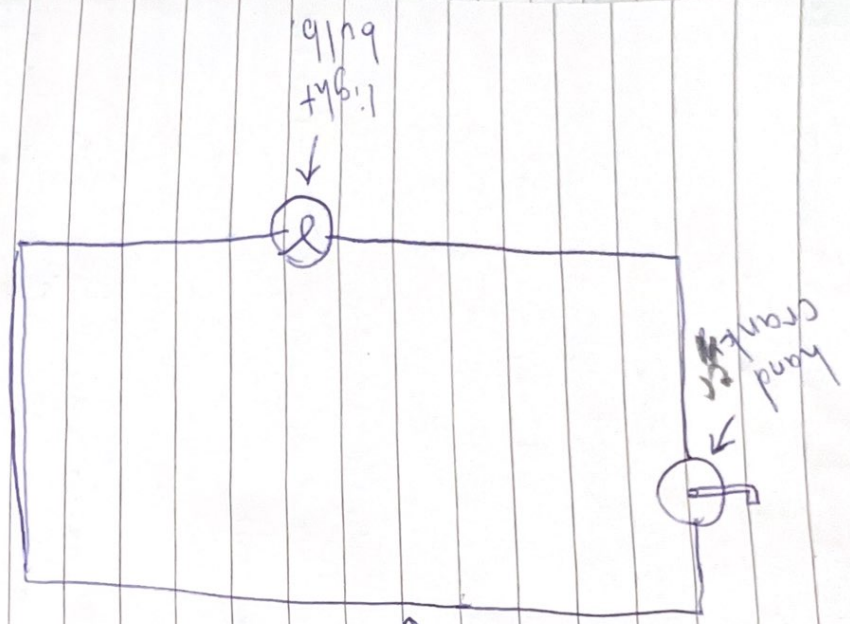
Jan. 28. 2024

o But the hand crank ~~is~~ was a little hard to turn.

o So, I need to get a ~~hand crank~~ new hand crank ~~er~~

o Will try again

Will Be Back!



Circuit with hand crank ~~er~~ wires

Jan 31 2024
Organizations for
Opega Science help

March 4, 2024

~~Abuse~~

V = Volts
A = Amperes

- I bought a new hand cranker
- Going to connect to different light bulbs
- Bulbs that I have =
 - bulb A: 6.3 V 0.3 A (no color) - bulb A
 - bulb B: 2.5 V 0.3 A (blue) - bulb B
 - bulb C: ~~3.8 V 0.3 A (green)~~ - bulb C
- Trying to test the circuit with new hand cranker and all of the bulbs.

~~Bulb A~~ ~~Bulb B~~ ~~Bulb C~~

- I tried it with Voltmeter
- Have to spin hand cranker to the left!
- Hard to see how much electricity is going through and making sure that the bulb lights up.

List of what I
want to ask Ms. Tang

March 4, 2024

- Do I have to upload my written logbook to the CYSF website?
- What does Citations, Acknowledgement and declaration mean?

I ~~Ma~~ tried to connect the ammeter in a parallel circuit and ~~it~~ didn't light up. the lightbulb

Ammeter has to be in a series circuit

I ~~Ma~~ tried to connect the voltmeter in a series circuit and it didn't work.

Voltmeter has to be in a ~~series~~ parallel circuit

March 4, 2024
~~Turn Facts~~

Facts

Observations

March 5, 2024

Light Bulb ~~A~~ B C = 2.5 v

~~When I spin the speed hand counter~~

1 When the reading on the volt meter says 1 volt, Light Bulb A C is very dim

So, I spinned faster

2. It was much brighter when the reading said 2 volts,

~~So~~ Then, I spinned even faster

3. It was very, very bright when it said 3 volts.

Observation = 3 volts will make it very bright, And to get to 3 volts

I had spin to spin the hand counter faster than I did with 1 volt & 2 volts.

March 5, 2024

Observations

Light Bulb G & B = 3.8V

almost no light
was very dim

1 = Light Bulb B - ~~didn't light up~~
when the voltmeter read 1. Volt

So, I spun faster

2 Light Bulb B was dim when it read 2 volts.

Then, I spun even faster

3. When the reading passed 3 volts, Light Bulb B was very bright

Observation = For Light Bulb B

to be very bright, the reading on the voltmeter should pass

3. volts. For me to get to 3 volts I have to spin the hand cranked very fast.

March 5, 2024

Observations

Light Bulb A 6.3V

1 = When the voltmeter read ~~1.5~~ /

1 volt light Bulb A ~~didn't light up~~

light up almost no light

2 = It was very dim when the voltmeter read 2 volts.

So, I spun faster

3 = It was not very bright

when the reading read 3 volts.

So then

Observation = I think Light Bulb A

will be very bright when the reading is ^{way} passed 3 volts. To reach

pass 3 volts, I have to spin really, really fast.

Kandassien

March. 5. 2024

Conclusion

March. 5. 2024

Analysis

So, for my conclusion, ~~the~~ the faster I spin the hand cranker, the brighter the light bulb will be.

My ~~conclusion~~ ^{Analysis} is =

- The faster I spin the hand cranker, the brighter the light bulb will be.

- The faster I spin, the higher the voltage ~~will be~~ reading is on the voltmeter

- The brighter the light bulb is, the brighter the light bulb will be

The faster I spin, there is more

electricity flow as shown on the voltmeter. The brighter the light bulb will be.

My conclusion =

^h You need enough electricity flow for the light bulb to light the brightest.

The higher the voltage of the bulb is, the more energy is required to light spin the hand cranker so that there is enough electricity flow to light the light bulb up the brightest.

Questions for Mrs. Tang.

1 = Presentation video: do I need to
~~do~~ record the video at home or
can someone record my presentation on
Friday?

Research

March 6th. 2024

Pg 1: Good morning, judges and thank
you for your time this morning.
I'm Lana from Grade 5.

Experiment on transformer which wires

Responsive Variable - my result
Manipulative Variable - manipulated
materials

Controlled Variable - everything else

Observations for ~~direction~~
which ~~the~~ direction I have to
spin to get the reading on the
voltmeter to read positive.

- When I connect the negative
terminal to the black +

March 11, 2024

Voltm

By

L.S

1. Negative

Black

Red - Red

Black - Black

Positive

Black

Negative

Red

Positive

Red

Clock wise

Anti-clockwise

AND Not working

AND

Reading on voltmeter

(positive/negative)

Positive -

Positive

March 11 2024

Negative - Red &

Positive - Black are

the same (A.C)

Positive

Negative - Black &

Positive - Red are

the same (C)

Positive

(with lamp socket)

Negative - Red &

Positive - Black ~~AND~~ Positive

(a.c)

Negative - Black &

Positive - Red are

the same (C)

Positive