Inquiry/driving Questions: What is the minimum voltage needed to light up an LED light

Predictions/hypothesis:

1.5 volts

Experimental design:

Step 1
Make an LED light up using batteries
Measure the minimum voltage required

Step 2
Make an LED light up using a hand generator
Measure the minimum voltage required

Step 3
Make an LED light up using an motor
Measure the voltage output of the motor(generator)
Write a list of ideas/questions about what you need to make this work
Share your ideas with another group
Share our ideas as a class

Step 4
Write a note in your experiment conclusion about your ideas of how you can make a motor light up the LEDs (can use pictures)

Observations:

Step1: To make the light bulb light up you need two 1.5 volt batteries.

Step2: When using a hand generator once the volts reached around 2.1 the LED bulb light up

Step3: with our hands we weren't able to reach a high enough voltage with our hands. Without batteries we reached around 0.4 volts with one batteries we could reach around 1.5 volts. We tried adding two motors to our circuit and spinning them by hand we only got 0.1 higher

Conclusion: (confirm or deny your predictions with supporting evidence, explain possible errors, ask more questions)

Our prediction of what is the minimum voltage needed to light up an LED light was wrong. We estimate 1.5 would be the minimum when it is actually around 2.1. The motor didn't work without batteries because we couldn't spin it enough so what could we use to make it easier to spin the motor faster?

What can we do to make our generator project light up and LED?

We could use a stream and gears to turn the motor
Attaching multiple motors can create a higher voltage
Get better materials such as a bigger motor
Try different ways to make the circuit stronger: parallel, resistor.