

Engineering Notebook

Mechatronics Engineering 2025-2026

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[github](#)



Instructions:

For each day that you enter data into your Engineering Notebook, Copy this template text and table for each project entry. The difference between a Physical Engineering Notebook and this Notebook will be that your most current entry (i.e. **Your newest entry**) will be at the “top” like a blog... Check [here for a Rubric](#)

Sometimes you will see a comment from your teacher. Please read, and if it's a question, answer it.

Comment or Question from Mr. Burnham: Check out the [New Blog Template Here](#)
Also, please have the newest Blog Entry here at the top... and turn all your text black from the **red**

<Date> <Title - Daily/Weekly “Blog” Project Title - compelling, descriptive title>

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8/19/2025 DMM resistor lab

Lab where we measure resistance and compare it to what the resistor itself says.

R #	Resistor Number Value (from Colors)	Measured Ω	Ω Error In Spec?
#1	Orange, Orange, Brown, Gold = 330 Ω 5%	326.4	3.6 Ω
#2	Red, Red, Orange, Gold = 22K Ω 5%	21.7K Ω	0.3K Ω
#3	Red, Red, Black, Gold = 22 Ω 5%	21.8	0.2 Ω
#4	Yellow, Blue, Yellow, Gold = 0.460M Ω 5%	0.462M Ω	0.002M Ω
#5	Orange, Orange, Black, Black, Brown = 330 Ω 1%	329.2	0.8 Ω



8/20/2025

Entry Ticket: I read a book about basic physics and space. It said in the book that mass can become energy with an equation like $E = mc^2$ and it said that black holes will stretch people apart. I found this book very interesting and enjoyed reading it

Today's Class Notes:

R #	Resistor Number Value (from Colors)	Measured Ω	Ω Error In Spec?	Measured Volts	Calculated I	Measured I
#0	Red, Red, Brown, Gold = 220 Ω 5%	217 Ω	3 Ω	5.16 V	23.8 mA	23.9 mA
#1	Red, Purple, Brown, Gold = 260 Ω 5%	269.8 Ω	0.8 Ω	5.1	18.9mA	18.86mA
#2	Brown, Green, Red, Gold = 1.5K Ω 5%	1.496K Ω	0.004 Ω	5.13	3.43mA	3.41mA
#3	Brown, Black, Blue, Gold = 10M Ω	10.21M Ω	0.21M Ω	5.13	0.502 μ A	0.5 μ A
#4	Red, Black, Red, Gold = 2K Ω 5%	2.06K Ω	0.06K Ω	5.13	2.49mA	2.47mA
#5	Red, Red, Brown, Gold = 220 Ω 5%	215.7 Ω	4.3 Ω	5.1	23.64mA	23.03mA

Planned Task List:

[Finish lab](#)

Useful Reference Links:

What Did I Do Today:

[Completed resistor lab](#)

What Will We Work On Next Time?

[Multimeter course](#)

8/26/2025

Entry Ticket:



I read about dark matter. I picked it because I didn't know what it was and it seems like the people who wrote the article didn't know either. It might affect me and the entire world if a planet nearby becomes a black hole from dark matter and consumes the earth. I don't think it would make the world better and instead it might make the world disappear.

Today's Class Notes:

What Did I Working On Today (Robot Club, Other Projects):

Designed fan box for soldering in CAD

What Did I Do Today:

8/27/2025

Entry Ticket:

I read about how people discovered what atoms are and how they work. I found it interesting since people took so long to invent chemistry and before that you used alchemy which was what they used to combine materials. People in the renaissance started having new ideas that were scientific and new ideas about atoms.

Today's Class Notes:

Types of Resistor

Resistors are passive devices that reduce voltage or current. They have different types such as High Stability, High Voltage, and High Current. Some resistors are more reliable or have different temperature ratings and the ones that are better are generally more expensive.

What Did I Working On Today (Robot Club, Other Projects):

	Measure d Rt	Measured R1	Measured R2	Calc R1 +R2	Measured Vt	Measured V1	Measured V2	Calculate d I	Measured I
	659 Ω	330 Ω	327 Ω	657 Ω	5.16 V	2.58 V	2.56 V	7.83 mA	7.79 mA
	43.4k Ω	21.78k Ω	21.68k Ω	43.46k Ω	5.13	2.557	2.568	118.2uA	116.2 uA
	10.18M Ω	21.65k Ω	10.19k Ω	31.84k Ω	5.12	10.7mV	5.11V	0.5uA	0.5uA
	0.464M Ω	0.462M Ω	2.056k Ω	0.464M Ω	5.12	5.09V	22.7mV	11uA	11.0uA
	13.37k Ω	326.2 Ω	13.04k Ω	13.37k Ω	5.18V	5.06V	126mV	387uA	371.1uA
	290.7 Ω	269.6 Ω	21.7 Ω	391.3 Ω	5.17	4.79V	385.7mV	17.9mA	17.38mA



What Did I Do Today:

Series vs parallel circuit?

Series adds resistance and current is the same

Parallel voltage is the same but resistance is added in reciprocal value

8/28/2025

Entry Ticket:

Article about solar

I picked this article because it was about electricity sources. I think it will affect me because I might need to buy some in order to create my own energy. I think it can change the world in a good way if we stop using non renewable things and use this instead. I didn't know that the United States had so many people using solar to create electricity. 27.7% of the country used solar in 2024 and it produced 9.2% more electricity.

Today's Class Notes:

Rt	Measured R1	Measured R2	Measured r3	Measured r4	Measured Vt	Measured V1	Measured V2
0.465MΩ	269.7Ω	21.9Ω	0.464MΩ	2.061kΩ	5.18V	2.9mV	0.2mV
Measured V3	Measured V4	Calculated I	Measured I				
5.16V	22.8mV	11.14uA	11.0uA				

What Did I Working On Today (Robot Club, Other Projects):

What Did I Do Today:

8/29/2025

Entry Ticket:

I watched videos about robots that look like humans. Don't know how to get links to more videos.

Today's Class Notes:

Learned about arduino and how it works

What Did I Do Today:

CAD box for fan

9/2/2025

Entry Ticket:



I read about AI data centers using nuclear energy. I found it interesting that people would trust AI with something so important. I think it would be impactful to everyone if we could have cheaper energy and a way to control and maintain nuclear reactors without accidents.

Today's Class Notes:

Learned about parallel circuits

What Did I Do Today:

CAD

9/3/2025

Entry Ticket:

I read a book about Newton's ideas and how they changed how people view the world. I learned that objects of larger mass have more weight than objects with smaller mass when they are at equal distances to the center of the earth because they have the same gravity constant but the further away an object is from the earth the less acceleration due to gravity it has meaning a smaller weight.

9/4/2025

Entry Ticket:

I read [this article](#)

I picked it because I want to know what quantum physics is. I learned that it is some type of physics with atoms that people want to develop into computers. I think it can have a big impact on the world if they can create even faster computers that could help do things like go to space or solve complex math problems. It could make the world better if maybe it could also run AI workloads

Today's Class Notes:

Measured R1 Ω	Measured R2 Ω	Measured $V_{(Total)}$	Measured $V_{(R2)}$
4.67k Ω	10.19k Ω	5.15V	0.1mV

9/5/2025

Entry Ticket:

I read [this article](#)

I picked this article because I think that stuff is always spying and data scraping. It might affect me if it keeps giving me ads for stuff I talk about. I randomly get ads for things I've never looked up after having a conversation about it with facebook open. The article says that it doesn't listen but I still think it does. It won't make the world better since it just means companies know all about your private information and have your data. The article mentioned things like targeted ads from other things but I still think that technology from big companies listen to you and use that to send you advertisements.

Today's Class Notes:



Arduino led stuff I made them blink.

9/9/2025

3	Measured R1	Measured R2	Measured Rt
1	985Ω	7.1Ω	982Ω
2	652Ω	473Ω	983Ω
3	126Ω	954Ω	983Ω
4	8.8Ω	987Ω	983Ω

2025-09-10 potentiometer lab and robot club

Entry Ticket:

I read a book about genetic engineering. I find it interesting because you can chemistry to make certain things stick together and other sticks not. I think it can impact the world if we can create animals and food that don't have genetics so farming is more efficient. They used alcohol and strawberries to show how it works.

Today's Class Notes:

Circuit	Measured V1	Measured V2	Measured Vt	Measured R2	Calculated R2
1	10.7mV	5.11	5.12V	988Ω	984Ω
2	3.13V	1.989V	5.12V	449Ω	382Ω
3	1.03V	4.1V	5.12V	935Ω	788Ω
4	3.62	1.5V	5.12	346.3Ω	288Ω

What Did I Do Today:

Finding the voltage of a potentiometer or variable resistor.

What Did I Working On Today (Robot Club, Other Projects):

Planned robot club project.

Materials:

Arduino

Rc wheels

Dc motor

Servo motor

Lego gears?

3d filament

Seal cartridge ball bearing

Potentiometer and arduino



Breadboard and jumper wires

9v battery

2025-09-11

Entry Ticket:

STEM-Magaziner-2023-06-J

Mechanics... STEM Career

I read an article saying that automatic mechanics is an important stem carrier because cars will keep breaking and also you can engineer new things in cars using math and technology. I think it is important for people to keep fixing and improving cars since it's such a convenient way to travel and also offers stem jobs.

2025-09-12

Entry Ticket:

Article about cleaning up from what you did.

I read an article about a guy who sold rock climbing equipment that damaged the rocks. He discovered this and decided that he would stop selling the equipment since it was bad for them and started a company that confronts environmental issues. I think it's important to try finding solutions for environmental issues and it can help the world if we had less of them. It's good that he did it even though it cost him money he made a good decision.

What Did I Working On Today (Robot Club, Other Projects):

I finished working on my C++ code to make an LED blink with a rng thing.

2025-09-17

Entry Ticket:

I read about Einstein and Germany in the book. It says that he was jewish and people there were racist Nazis that did bad things to jews. The book also says that Einstein was very good at math but not other things in school.

2025-09-18

Entry Ticket:

I read on sparkfun that they sell a current sensor that measures the voltage drop. I think this could be useful to our group in our robot club project because we can make our gearbox auto shift. This website seems cool since they have all of these microcontroller accessories that would be useful in our class. They also have these little kits you can buy so you can make an entire project from it.



Today's Class Notes:

Test	Brightness	Selected R_2	Measured V_2	Measured V_T	Derived V_p	Calculated I	Calculated R_p
	example	1K Ω	0.07mv	4.82v	v	mA	Ω
1	Covered	0.993k Ω	169mV	9.2V	9.03V	0.17mA	53k Ω
2	Some Light	0.993k Ω	0.5V	9.21V	8.71v	0.5mA	18.4 Ω
3	Room	0.993k Ω	1.196V	9.21V	8.014v	1.2mA	6.7k Ω
4	Brighter	0.993k Ω	2.3V	9.21V	6.91v	2.31mA	2.9k Ω
5	Full Bright	0.993k Ω	4.18V	9.21V	5.03v	4.21mA	1.2k Ω

<https://www.physics-and-radio-electronics.com/electronic-devices-and-circuits/passive-components/resistors/photoresistor.html>

2025-09-19

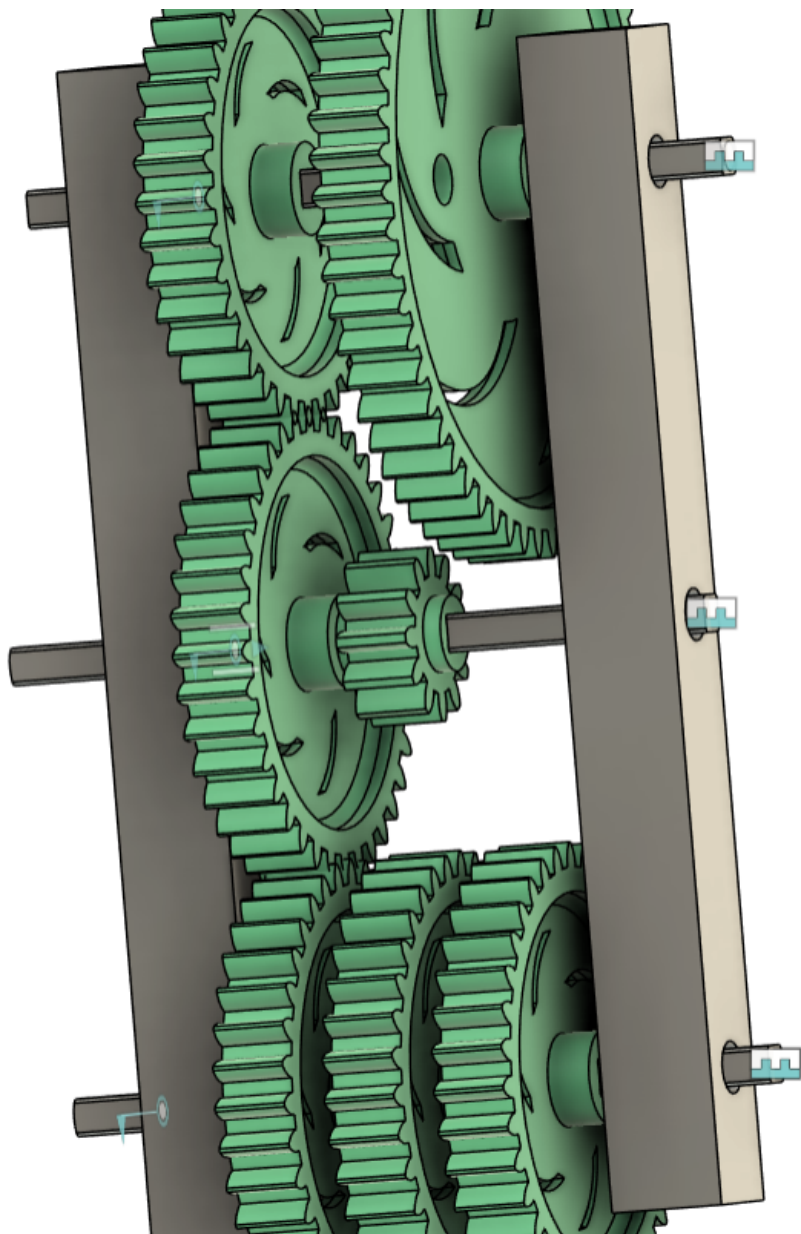
Entry Ticket:

I read an article about drones. It is interesting because the new ones can be flown indoors and they make them not as expensive. I think it can change a lot of things since you can go into crime scenes and schools without danger and see what is going on inside. It also could be useful to find people in natural disasters if it's dangerous to go inside.

What Did I Working On Today (Robot Club, Other Projects):

I made gearbox for our project





2025-09-22

Entry Ticket:

Space edge on ISS

There is now something called the space edge on the ISS which is a giant computer for processing things in space instead of sending it to the earth to be processed and sent back. This will reduce the amount and latency of doing things and make faster decisions. It's interesting since it will make the space station more independent and functioning by itself and maybe in the future all space stations will be like that and not rely on other things.

2025-09-12

Entry Ticket:

I read about a rubber company that makes o rings

O-rings can't withstand certain temperatures and environments so in cold places like Alaska they fail and cause leaks and problems. The company applerubber came up with a solution using different materials to experiment and they found one that could withstand harsh environments and temperatures. They used these to make house leaking problems fixed and chicken



feeders. They also made a type of beer seal to not change the taste of the beer when it got cold. I think it's useful to make o-rings that survive harsh conditions since you might need it in a rocket or something important.

Today's Class Notes:

[Arduino lab #4](#)

[Arduino lab #5](#)

2025-09-24

Entry Ticket:

Engineering book

I read a book about hands-on mechanical engineering. It talked about physics and simple machines with mechanical advantage to increase or decrease force. It also talks about work and energy since work in is ideally work out. The book also showed projects people made using these things and someone made a tank with 3d printed parts and differential.

What Did I Working On Today (Robot Club, Other Projects):

We found the parts for our robot and assembled the gearbox. We need to add a servo and spring to finish our gearbox. We also need to design a chassis and connect it to the gearbox with a motor. I need to find a way to put the servo on the beams pins.

2025-09-29

Entry Ticket:

I read about an article that says elon musk is suing open ai for stealing grok's secrets. They are trying to prove that openai hired their employees and they took secrets from grok to use in the openai model that was supposed to be special to grok.

2025-09-12

Entry Ticket:

I read about how AI startups don't fail as often as already established companies. According to the article it's because these companies already have a way they work that makes it harder to develop faster. Also they lack skills and their models don't adapt to new things. If it made a mistake it doesn't remember to fix this the next time and instead keeps making it again.

What Did I Working On Today (Robot Club, Other Projects):

We made our presentation for the moisture sensor. It can see something is moist and has water on it.

2025-10-1

Entry Ticket:

I read a book about physics. The book has simple machines and explains how IMA of a pulley works. It is good to use the pulley if you need to increase the force. If you need to move something but can't create enough force using the simple machine you can amplify it.

2025-10-2

Entry Ticket:

I read an article about the best AI chat bots. It says that chat gpt and google gemini are the best because they can have conversations with you and upload content like pictures and documents. It can change the world if people stop being social and instead talk to the chatbot only leading to less social interaction between people. It also could make people lazy if it knows how to help you do everything you never will do any more work again.

What Did I Working On Today (Robot Club, Other Projects):

I tried to work on the presentation. My partner is tweaking and doesn't do work then deletes my slides and puts some template he finds online that is ugly. I also finished my Arduino ultrasonic sensor lab.



2025-10-13

Entry Ticket:

idea to app in 5 mins (without code)

You can use ai to code more now and this new one will SHIP your apps and you don't have to make api or database. I can see this being helpful for people who don't know how to program well or don't want to spend lots of time doing it but it also could lead to people learning less since it's so easy already and it can make people lazy

What Did I Working On Today (Robot Club, Other Projects):

We did our robot club project and are trying to CAD a mount for our servo to go onto the gearbox. We have to measure with the caliper then 3D model it and print it. The pins might end up not fitting so we'll probably have to reprint it a few times.

2025-10-15

Entry Ticket:

Read book about 2^{32} and how it was a problem with computers

What Did I Working On Today (Robot Club, Other Projects):

Printed mount for servo so we connect to the gearbox. I reprinted a new one for tomorrow

2025-10-15

Entry Ticket:

I read an article about 32 bit numbers. Some computers can't exceed this limit making them shut off when they get there so it says there was a plane computer at an airport that did this since it was running for 2^{32} milliseconds and it caused hundreds of flights to get canceled and delayed.

What Did I Working On Today (Robot Club, Other Projects):

