

# Mechanical Literacy

Imagine waking up in a world where no one knows how to make anything. There would be no factories, cars, houses, or even simple tools like hammers and knives. Nothing would get fixed or maintained and tons of useful objects would become completely useless. This is what a world without mechanical literacy would look like, a world with tons of objects that people depend on, but can't create, repair, understand, or use them.

Mechanical literacy is defined as the foundational knowledge and skills required to understand, manipulate, and work with physical objects, machinery, and mechanical principles. It's not just knowing gear ratios, complex math, or even something you need to go to school for, but at a basic level, it's understanding how things interact with each other, recognizing why something works or didn't work, and imagining ways it could work better or imagining something new entirely. Mechanical literacy allows you to read the world like a book, which tells you how to understand motions, forces, materials, and so much more.

In my own life, mechanical literacy didn't start with school, textbooks, or formulas, but with curiosity, taking things apart, playing around with it and figuring out how it works, and trying to change it or put it back how it was. Mechanical literacy isn't just mechanics, but also a mindset and way of thinking and problem solving, which is something that everybody uses in their everyday life, such as preventative care for a car like checking tire pressure, or understanding the safe way to use an oven.

Mechanical literacy can be traced back to 18th and 19th century Britain, during the height of the industrial revolution, explaining physics, manufacturing, and global trade to children. Mechanical literacy was especially important at this time because it was during a huge transition period from a mainly agricultural society to an industrial one (Heckel, 2024).

I started acquiring mechanical literacy early on when I started playing with old wooden tinker toys, and eventually started making contraptions out of them. Eventually, my parents realized that I liked to make things, and they started buying me Meccano sets, allowing me to further explore my interests. Around 2nd or 3rd grade, my parents signed me up for Camp Invention, a program held during the summer to help kids grow their creative thinking and problem solving skills. In 4th grade, my parents then signed me up for Math,

Science, and Computer camp, which was a program meant to grow kids' interest in math, science, computers, and other STEM fields. Both of these camps were very fun and I am glad I got the chance to attend as they both really helped to grow my interest in mechanical engineering and grow my mechanical literacy. In 6th grade, I joined Vex Robotics, which I stayed in up until 11th grade. Vex Robotics really cemented my interest in mechanical engineering and is probably the biggest contributor to my mechanical literacy skills, as it involved designing, building, troubleshooting, and fixing a robot, especially during frustrating times when a robot would break mid match and we would lose, which would need a quick identification of the problem and fix. Throughout the years, I would also help out on my uncles' farms, part of which involved getting hands-on experience with driving and maintaining farm equipment, which furthered my interest and skills.

One of my biggest literary sponsors is my grandpa. He has a very similar interest in the mechanical world and was always working on some sort of project that he would let me help with. As I got older, I got more involved with some of his projects and even had him help me with some of my own, such as fixing the lift system of my parents' pop up camper, which involved taking apart the entire interior to get to the mechanisms and fixing the steel cables that did the lifting, fixing up an old pump, which involved new fittings, wires, and a fresh coat of paint, or installing an automatic sprinkler system that uses lake water, which involved digging a long trench for the pipe. He truly contributed greatly to my skillset in mechanical literacy and to my interest in being a mechanical engineer. My other two biggest sponsors are my parents. Without them, I would have never gotten the chance to explore my interest and gain mechanical literacy early on, and probably would never have gone for mechanical engineering if I didn't. Without them, I wouldn't even be writing this story.

My literacy journey mainly consisted of hands-on experience, especially early on in life, which is a big reason I'm pursuing a mechanical engineering degree. Mechanical literacy has been a huge part of my life for as long as I can remember and it'll never stop being a huge part of my life for decades to come. I think people can learn from my journey that interest starts early on and fostering that interest is very important, although it is never too late to pursue your interests. As explained in Debora Brandt's article *Sponsors of Literacy*, literacy does not develop in isolation, but through sponsors, people who provide resources, knowledge, opportunity, and guidance, and help shape how that literacy is used (Brandt, 1998). My mechanical literacy grew the same way. They did not just help me grow my interest, but also created the condition for me to learn and develop skills and what I want to use those skills for.

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