Tackling Physics like Building Lego Houses

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Oftentimes, after going through Physics questions with students, I would get questions that go something like "Cher, can I use this way to solve all similar physics problems from now on?"

If that thought ever come across your mind, I would say tread with caution.

The thing is, all Physics questions are never similar. A slight change in the words may mean a different thing altogether. For example, change 'dc motor' to 'ac generator' and you will require an entirely different set of laws to solve the problem even though the diagrams will look similar with slight changes. A displacement vs time graph and a velocity vs time graph will totally mean different things even though the shapes of the graphs are the same and both are against time.

So, we have treat to Physics like we are building Lego houses.
To build a Lego house, you need to first know what the house needs. How many doors? How many windows? Is a chimney required? What is the width, length, height? Are lights needed? How many people are living inside?

This is similar to understanding the question first. What is the question testing you about? What key information is given? What is the end goal? Beware of different units involved so you may need to convert them.

Whenever students' answers are wrong, I would ask them to read the question again. And then they realized they left out something. One needs to know what Lego house to build before building anything.

Only after knowing what house to build, then we can start building.

Building a Lego house requires Lego bricks and other materials. So, we have to source for them. They are similar to the basic concepts of physics - the definitions and formulae. So, we have to dig into our memories and summon them. This is why it is important to memorize.

Lastly, we have to start building. Where do we start? Build from the base and up? From the side and then sideways? It really depends on the builder and what the house requires. This is similar to our methodology in solving the question. To be better in this, the student needs to do more challenging questions and then study and understand the solutions. Notice that I did not mention 'memorize'. One cannot memorize methodology. One needs to understand and internalize it.

If you are feeling frustrated from studying Physics, think back and ask yourself if you have going through the steps mentioned above. It may take a while to realize it. Be patient with yourself. The brain works best with a little bit of stress but not too much.

If you are doing well and you want to do better, then maybe the last step is all you need. When doing practise papers, always look for the challenging questions and skip the easy ones. Be happy to do questions which you don't know how to do, for you know you are the edge of your comfort zone and you will expand and become better in Physics after learning how to do the questions. That is a level-up for you.

I wish you all the best in your learning journey.

BRAIN MATTER