



**Prize Winner**

# **Science Writing**

## **Year 3-4**

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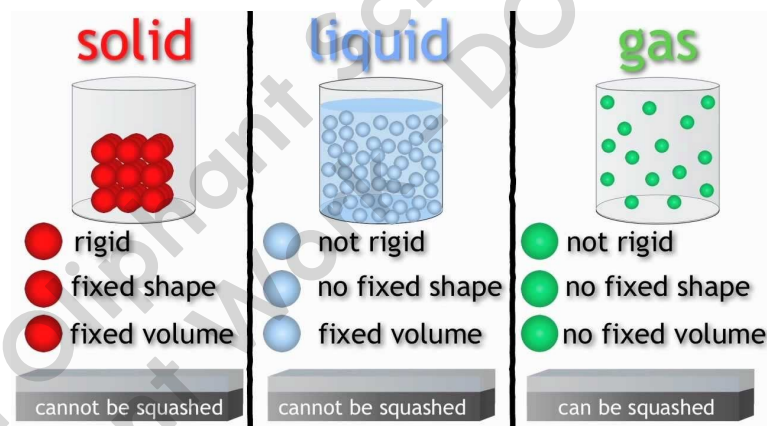
***Physics: the very tiny & the  
very large***

Physics is part of our life everyday even though you might not notice it. Physics could be as small as atoms or as large as planets. It might be Newton's Laws of motion or the centripetal force either way physics could be a part of the simplest actions you do on a daily basis. Physics helps us to understand different states of matter like solid, liquid and gases by explaining the structure and composition of individual states of matter.

**Solids** are made of small particles called *atoms*, atoms are packedly arranged leaving no space between them that means atoms can't move freely. Now this arrangement helps us to understand why solids have a fixed shape and volume. Solids are rigid as well.

**Liquids** have atoms which have little space between them so they can move from one place to another. It also helps us understand how liquids can change formation and alter its shape when put in the required area. Liquid is unlike solids are not rigid.

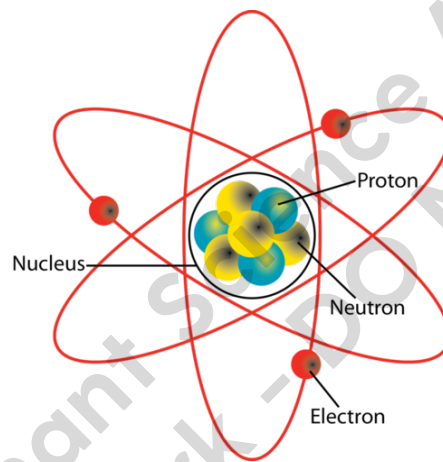
**Gases** on the other hand are made up of atoms which are freely distributed (having large spaces between them), this helps them move effortlessly, that's why they do not have any fixed shape or volume. Same like liquids though, they are not rigid.



# The very tiny!

Now to tell you something that you hopefully do not know... Do you know that atoms are made out of things that are even more microscopic than atoms? Well these things are called **neutrons**, **electrons** and **protons**.

An atom has a central part called the nucleus which contains protons and neutrons. Protons are positively charged and neutrons are neutral and don't carry any charge. Outside the nucleus there is a space where electrons circle the nucleus. Electrons carry a negative charge which is the opposite of what protons are charged up with.



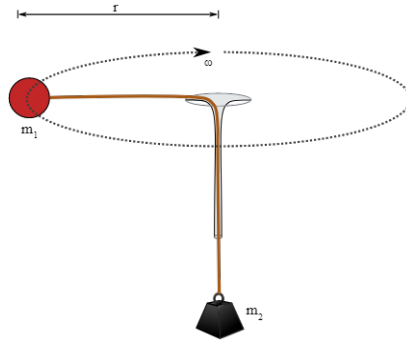
So this is what I call the very tiny. Now to my next concept...

# The very large!

Now this might be a bit different to what I explained above, mostly because we have the big concepts now, such as astrophysics, quantum physics and a lot more. From here on we're not talking about atoms or molecules, no none of that. Now we're going to talk about something cool, forces!

Now our first force which I had written down in the opening statement, the **centripetal force**! Have you ever wondered how sometimes a ball on a string moves in a circular motion? Well you can thank the centripetal force for that. See the centripetal force is the force that makes things go in a circular motion. My

example of the centripetal effect occurs when you hit a ball that is tied up on a pole and it goes around it in circles. That's the centripetal effect. The centripetal force needs an axis and velocity to work.



So you thought the centripetal force was cool and nothing is better than it. Well if you thought that, get ready to be amazed. So now introducing ... **Gravity!**

Gravity is the force that keeps you on the ground. Like when you jump, gravity keeps you down. When you kick a ball gravity makes sure it lands. Outside earth's atmosphere there isn't much gravity that's why you see astronauts flipping around and doing somersaults in the space station. There is no gravity to pull them down back on the surface. Without gravity the world would be so chaotic. Imagine an earth with no gravity. If you would jump very high on a trampoline you would go flying into the air because there would be no gravity to pull you down. So now you know why gravity is so important and why we really need it, it's time to move onto something even larger than forces.

Now it's time for **astrophysics!**

In astrophysics we are going to talk about the solar system. The solar system consists of 1 star (the sun), 8 known planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune), 5 Known dwarf planets (Pluto, Eris, Ceres, Makemake and Haumea) and 200 moons or natural satellites. As you can see I just put some or most of the solar system in numbers and you can already tell how big it really is.

So in conclusion physics is all around us. It could be very small like atoms or protons but it also could be like astrophysics or the centripetal force. So I hope you remember how atoms can form solids, gases and liquids. Also how atoms are made up of protons, neutrons and electrons. Remember about the centripetal force and you will see how commonly it pops up and whenever you're learning about the solar system remember about astrophysics and impress your classmates with your knowledge.

## References:

- My Mum (Being a botanist, she knows a lot about science.
- My prior knowledge from reading books and watching news
- School sciences
- <https://www.schoolsofkingedwardvi.co.uk/ks2-science-year-4-3-states-matter-solids-liquids-gases/>
- <https://www.khanacademy.org/science/physics/centripetal-force-and-gravitation/centripetal-forces/a/what-is-centripetal-force>
- [www.google.com](http://www.google.com)
- <https://courses.lumenlearning.com/earthscience/chapter/atoms-to-molecules/>
- <https://kids.kiddle.co/Astrophysics>

THE END