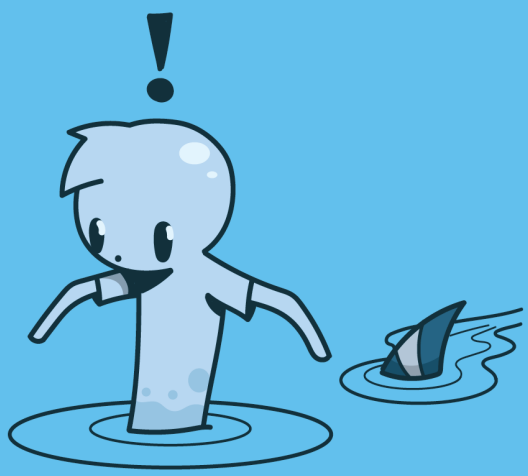
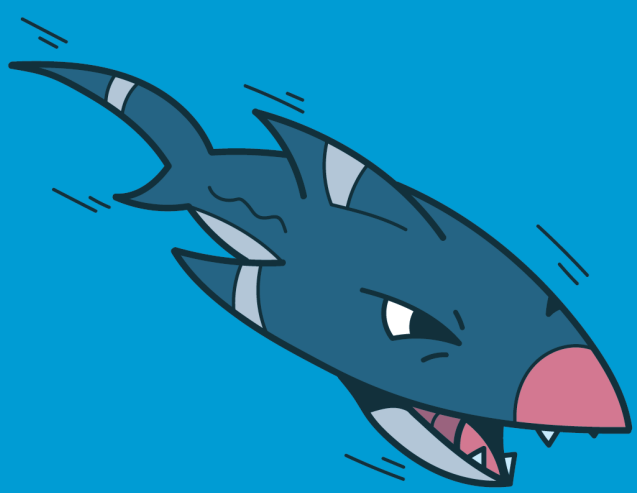
Dripping the Scales

Connecting the future of pump design to one of nature's oldest apex predators.

If you've ever tried wading through water, you know just how hard it can be to move through it. This is due to **viscous drag forces** that impede your motion.

These forces also affect us when we're walking through air. However, since air is less dense, we feel them less.



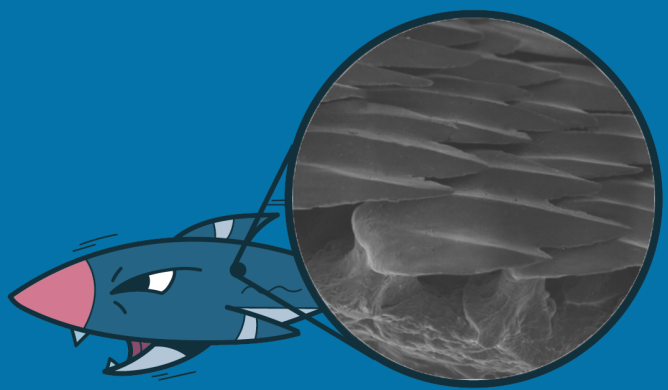


This is why the fastest 100m dash on land clocked in at about **23.3 mph**, while the fastest speed for the same distance in water was only **4.77 mph!**

In contrast, the fastest shark alive, can reach top speeds of **46 mph!** Good luck outswimming one of those!

So how can sharks swim so fast?

Sharks scales have evolved over time to develop a complex structure of microscopic **riblets** that reduce these viscous drag forces and enable their fast swimming.



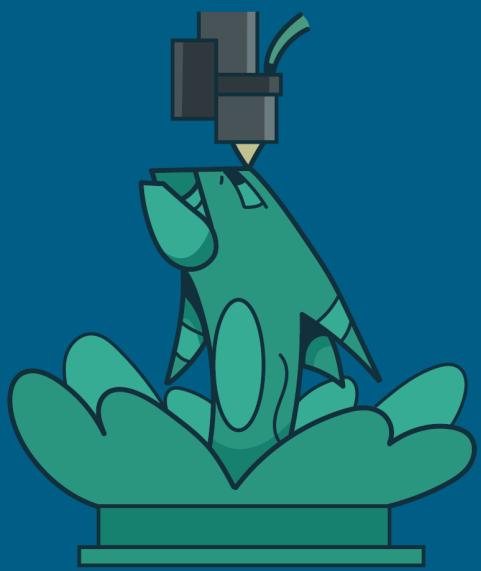
So what does this have to do with pumps?

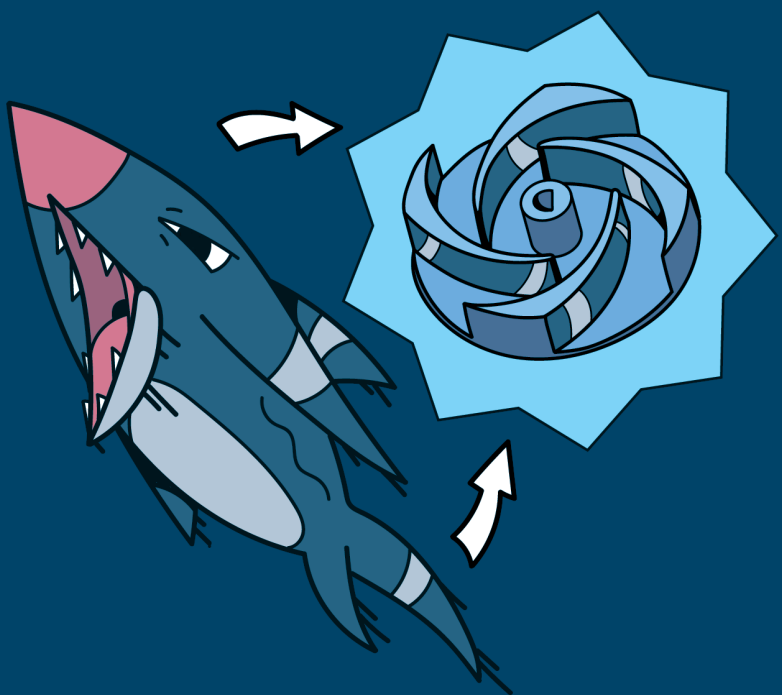
Impeller Pumps are a special type of pump that use a rotor to accelerate fluid. When spinning, they suck in water from the inlet and release it radially at higher speeds.

They are common in many industry applications due to being **low-maitenance**, easy to operate, and **highly efficient**.

Despite this, impeller pumps still experience a lot of **energy loss** due to the interaction between the working fluid and the impeller blades.

Traditional manufacturing has limited the ways in which this loss can be reduced, but new **3D-printing technology** could allow us to reduce these losses even further.





That's where sharks come into play!

Inspired by sharkskin, our team developed **non-smooth surface textures** that can be 3D-printed onto impeller blades to improve their efficiency by reducing drag forces.

The technology still needs some refinement before seeing commerical use. However, our team's efforts have brought us one step closer to radically changing the future of pump design with the help of one of nature's oldest apex predators.