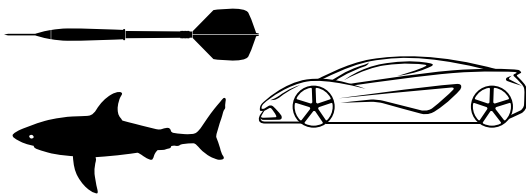


## Learn about: Hydrodynamics in boat bow design

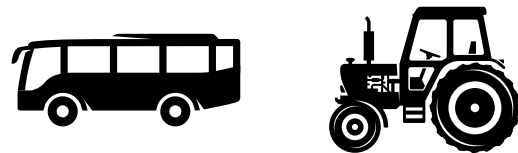
# Angles on a Boat

**Angles Question 1:** Think of things that travel quickly. A dart. A supercar. A shark. What do you notice is common to the front of all of these things?



**THEY ALL HAVE POINTED FRONTS**

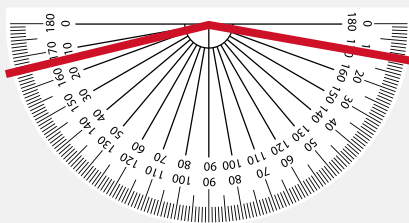
**Angles Question 2:** Think of things that travel slowly. A bus. A tractor. What do you notice is common to the front of all of these things?



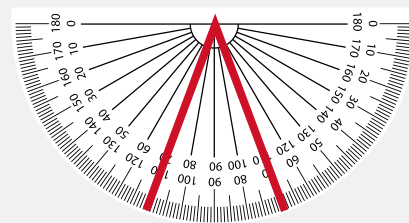
**THEY BOTH HAVE FLAT FRONTS**

When an object travels, it is met with air or water resistance, which slows down the object. The sharper the front, the lower the resistance. This means that objects with a sharp front, experience less air resistance, and so are able to travel fast. Objects that travel quickly through water can be described as hydrodynamic and objects that travel quickly through air can be described as aerodynamic.

Imagine the front of a boat, also known as the **bow**. It is crucial to design the front of the ship to be hydrodynamic, so that it travels through the water quickly. This means the angle of the bow needs to be sharp.



This image above shows a wide angle for the front of a boat that is **not** hydrodynamic. This means it will encounter a lot of resistance and so travel slowly, but it will allow more space for cargo and/or passengers.



This image above shows a sharp angle for the front of a boat that is hydrodynamic. This means it will encounter less resistance and so can travel faster, but it will struggle to carry lots of cargo and/or passengers.

**Aerodynamic:** having a shape which reduces the drag from air moving past

**Hydrodynamic:** having a shape which reduces the drag from water or other liquids moving past