

Golden Globe Ocean Race: Navigating at sea, rough seas and speed

How do we navigate at sea?

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Dr Mark Brandon:

By measuring the height of the sun above the Earth you can work out your latitude. And what have got here is a scientific instrument called a sextant. And it's the piece of kit a ship's officer would use on a ship to measure the height of the sun above the Earth. So you bring the sextant up to your eye. And what you've got is two mirrors a mirror at the top, a mirror at the bottom and an eyepiece. And light from the sun gets reflected in this mirror to this mirror into my eyepiece.

Now by moving this at the bottom, what I'm doing is changing the angle at the mirror at the top. So what I see in the sky is changing in the telescope. And I can adjust it so that I can see an image of the sun through the telescope. If I twist this very carefully, then very accurately I can move it. So just the very tip of the sun is touching the horizon I see through the telescope. Now a piece of scientific kit like this cost about £200. But I'm going to show you is using some stuff that I gathered around my house. Had to make something similar, it's a bit of a rough measurement but it's just as good.

[MUSIC PLAYING]

And there we have it our low budget sextant. So the Marine sector measures the height of the sun using mirrors. My cardboard version I've built here I can also use to measure the height of the sun. What I've got is a base that doesn't move. And then I've got this arm on the top, which does move.

Now on the arm I've got a protractor and a plumb line. Now this key is just showing me where vertical is. So if I move this, I can read off the angle using the plumb line and the protractor that I've stuck on there. There you see either end I've got two screws. Now each one of these screws is going to make a shadow from the sun. So if I line this piece of kit up with the sun, I will get two shadows one from each screw.

Now as I turned the angle of this, what will happen is the two shadows will change their position until eventually the two shadows will overlay and become one shadow. And when they overlay this angle will be exactly the altitude of the sun. And you can read that off from the plumb line and using my protractor. Now that angle is related by something clever which is on the module website to the latitude that you're out.