

Engineer Inside

Hints and Tips

Launch an Object Challenge

Dr Antony Allen

Hello, my name is Dr Antony Allen. I'm an Associate Professor in Energy and Propulsion at WMG, that's Warwick Manufacturing Group, at the  University of Warwick.

Idea number 1

Fairly simple really - I've been looking around the kitchen as to what I've got. I've got a rolling pin, I'm thinking that might be quite useful. Nice and round. I've also found a spatula here, so what I was thinking I could do is maybe make some kind of catapult, or, a leverage arrangement here. And something I'll be able to play with here is changing the leverage, so at the moment that's half and half. But I could go like that: maybe two-thirds and third. Or I could do that the other way I could go to two-thirds this side. Two-thirds and one-third. I'll find out, we'll experiment and we'll see what happens.

Okay so we've come outside now. We're going to have a go with idea number 1 to start with. I've enlisted the help of an assistant, this is..

[Wilfred]: Wilfred.

[Antony]: How old are you Wilfred?

[Wilfred]: 8 years and 11 months.

[Antony]: 8 years and 11 months so you're nearly..

[Wilfred]: 9

[Antony]: Nearly 9, okay. So, Wilfred, you're going to have a go with the catapult aren't you?
So do you want to set that up?

Wilfred places the rolling pin on the table and lays the spatula on top.

[Wilfred]: So it goes that way, right?

[Antony]: What Wilfred's doing here, he's been a little bit clever, he's put his finger over the top of the spatula there so that it doesn't slide one way or the other. Okay, are we going to play with the paper first?

[Wilfred]: Yep!

[Antony]: So he's put it on the larger end of the  catapult.

[Antony]: Okay!

[Wilfred]: And I'll move everything out the way.

[Antony]: Off we go!

Wilfred slams his hand down on one side of the spatula, launching the paper ball into the air. The scene cuts to show a small stuffed toy on the improvised catapult.

[Antony]: Nice and hard, go on! Okay!

Wilfred launches the stuffed toy.

[Antony]: Shall we try those different positions that we talked about?

[Wilfred]: So I'll move it a bit..

Wilfred moves the spatula so that the side that he is going to slam his hand down onto is short and the side with the object that is about to be launched is longer.

[Antony]: Now that didn't go as high, did it?

[Wilfred]: No!

[Antony]: So what do we think, if we go the other way? What do you think will happen then? Do you think this is going to higher or lower?

[Wilfred]: Higher, because I'm only moving a little bit, Foxy is moving quite a lot. So we're going to go...

Wilfred launches the paper ball from the catapult with the object on the longer side and his hand hitting the shorter end. The paper ball flies up and bounces off his head.

[Antony]: Oops! Hit him on the head.

Wilfred launches the stuffed toy in the same way. This time, Antony catches it.

[Antony]: That was quite good! Managed to catch him that time. As we played with the different positions it went to a different height.