KS3 Geography. Richard Hammond's wild weather

Why does water fall as rain?

NARRATION: Wherever you live on the planet, weather shapes your world. Yet for most of us, how it works is a mystery. So, I'm going to strip weather back to basics - uncovering it's secrets in a series of brave, ambitious and sometimes just plain unlikely experiments. To show you weather like you've never seen it before.

TO CAMERA: We talk about heavy rain, but water *is* heavy - very heavy.

NARRATION: To give us an idea of just how heavy, we're going to take the annual rainfall for England's rainiest place and put it ... in this bucket.

TO CAMERA: So, we have four cubic metres of water in the bucket - which amounts to four tonnes - at height. Then, beneath it, you'll see we've found a car. For scientific purposes.

NARRATION: Let's see just how much damage that amount of water can do. Hmm. Looks like rain... Yeah - pretty brutal. But I shouldn't be surprised. Because the water actually weighed four times more than the car underneath it.

TO CAMERA: [INSPECTING THE CAR.] Oh, they're going to notice! But it does prove the point. Water is really heavy. That's just the annual rainfall for Borrowdale. Where I've been going on holiday all of my life. Explains something about it!

NARRATION: Luckily, this could never happen with real rain. To show you what I mean, I'm hard at work building a sandcastle. And Professor Jane Rickson, from Cranfield University, is filling a plastic bucket - from a pond.

RICHARD: There were always kids like you on the beach, weren't there?

NARRATION; OK, so what's all this about? Well, pour water on a sandcastle and you completely flatten it. No surprises there. But rain doesn't fall from waist height. It falls from clouds that are at least 300 metres above the ground. And that makes all the difference.

Let me show you, by building another sandcastle. I'm throwing the water off something ... just a little bit higher.

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TO CAMERA:	Now obviously, this isn't as high as a real cloud: they start at around 300 metres. This tower is 30, but it's tall enough for what we want to do.
JANE RICKSON:	OK, Richard, let it go! [WATER RELEASED TO WRONG AREA.] Idiot!
NARRATION:	Yeah, wrong side. Let's try it again. And so, another bucketful leaves the tower, but what arrives below ... is rain.
RICHARD:	So, why? Why is it if I throw the water from up there, you'd think it would smash it to bits even more but it's still standing what's the difference?
JANE:	Well, what happens ... as you were throwing that water down, air resistance the turbulence in the air, is overcoming the surface tension of that lump of water, breaking it into smaller drops.
NARRATION:	As the water falls, it meets air resistance and the larger the lump of water the more resistance it experiences. That friction breaks the water up into smaller pieces, sometimes inflating the drops like parachutes, before blowing them apart. The further they fall, the smaller those drops become. Until, finally they're so small that the air has little effect on them. If our digger had been just a few metres higher ... then the car might well have survived.

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