KS3 Geography: Physical geography with Liz Bonnin

How can plate tectonics impact oceans?

LIZ BONNIN: Hi, I'm Liz Bonnin and this next clip looks at plates and eggs. The plates are tectonic plates that make up the Earth's crust and are constantly moving very, very slowly. Either rubbing against each other or pulling away in different directions.

And the eggs, well they're part of an underwater experiment carried out by a team of ocean scientists in the Sea of Cortez, off the coast of California and Mexico, right around here.

NARRATOR: **Although life is changing fast here, change itself is nothing new to our seas and oceans. In fact, their size and shape are constantly shifting.**

Oceanographer, Tooni, has brought the team west to the Bay of Conception, because here you can actually see that process in action.

Beneath these calm waters is a giant fracture in the Earth's crust. It's part of the infamous San Andreas Fault Line, and it created this sea.

TOONI: The Sea of Cortez is quite young in geological terms. The peninsula split away from the main coastline of Mexico about 5 million years ago. So it basically started tearing apart, and the great thing I like so much, is the fact that it's still moving. The whole of the Baja Peninsula is moving pretty much west, at a rate of about 5cm a year.

NARRATOR: **This bay offers Tooni the chance to look for evidence that this sea is getting bigger. And Paul's hoping she'll cook a snack in the process.**

PAUL: Lewis, can we have six eggs, *huevos*, would that be okay? Thanks very much, thank you. Here you go Lucy, don't forget these! Mind your head. Good luck, happy cooking.

LUCY: Thank you!

NARRATOR: **Tooni and Lucy are swimming over part of the San Andreas Fault Line. As the Earth's crust is being ripped apart beneath them, heat and gas, from the centre of the planet, are escaping through cracks called hydrothermal vents.**

TOONI: Oh look! Look at all these bubbles coming through!

LUCY: Oh, God, yeah.

NARRATOR: **It's rare to see a hydrothermal vent in 5 metres of water. They're normally found deep beneath the surface.**

TOONI: Oh look, you can see the heat shimmer! This shimmering water, where the hot water's coming out of the ground and mixing with the colder sea water around it. And that's the evidence of all the hydrothermal activity, accompanied by all the bubbles. *[Lifting a stone]* Oh, that's hot! That's really hot. It's actually burning my fingers.

NARRATOR: **This hot water is over 90 degrees centigrade. It once trickled down through cracks in the Earth's crust towards the furnace of the inner Earth. There it was super-heated, and forced out into the Sea of Cortez.**

TOONI: Right, so we've brought our eggs with us, and we're gonna bury them here. Because it's really, really warm here. And then we're gonna take them back on board for lunch. We're cooking in the sea floor. It's not right.

NARRATOR: **Hot, mineral-rich water like this is only found in places where fault lines are tearing the Earth apart. It proves that directly below the team, the Earth's crust is slowly moving, and this sea is steadily growing.**

Seas and oceans are thought of as immovable features of our planet. This dive has shown they're anything but.

LUCY: It's quite amazing to think that this action of the tearing apart of these two land masses is continuing. It's been going on now for over 5 million years.

NARRATOR: **But although this process created the Sea of Cortez it will also destroy it. As Baja California continues to move north-west, it will eventually break away from the mainland to become a giant island. Then the Sea of Cortez will disappear forever, engulfed by the rest of the Pacific Ocean.**

PAUL: Hey, hey. I know what you're holding! You can't fool me! Boiled eggs! Hard-boiled eggs, soft-boiled eggs? Do you know what I'm struggling with? It's soldiers! I don't know what Spanish is for soldiers! That looks perfect to me.

MAN #1: That does look good!

LUCY: That is ... a hard-boiled egg.

PAUL:	That's a perfect, perfect hydrothermal vent boiled egg. Is it okay to eat it? Of course it's alright to eat it.
LUCY:	Yeah you just need something to eat it with. You could do it like an oyster couldn't you?
PAUL:	I guess I could, couldn't I.
TOONI:	What, in one? Urgh!
PAUL:	*[Eats the egg]* Well that's absolutely brilliant!
TOONI:	Did you just down an egg in one?
PAUL:	It's absolutely brilliant. Well I thought it was worth a go.
TOONI:	Gross, you're disgusting.
PAUL:	Sea of Cortez, eating eggs cooked by Lucy and Tooni on a hydro-thermal vent.
MAN #1:	Awesome.
PAUL:	Oh, cheers, mate.
LIZ BONNIN:	And if you're wondering why only one of those intrepid explorers was brave enough to try the eggs, I guess the rest were just too chicken. Sorry.