HAVE FUN! DON’T ANNOY GRANDPA AND GRANDMA!

HAVE FUN IN HAWAII!

WHEN ARE THE RENTS COMING BACK?

IN FOURTEEN DAYS. THEY ONLY LEFT THIS WEEKEND!

MAYBE I KNOW SOMETHING THAT WOULD INTEREST YOU...

AND WHAT WOULD THAT BE?

A MINE!
IT’S BORING IN HERE, THERE’S ONLY DARKNESS TO SEE.

LET’S GO SOMEWHERE ELSE!

LET’S CHECK OUT THIS SHED...

WHAT CAN BE MEASURED WITH SEISMOLOGY?

SICK! LIKE A MOVIE SET!

BUT WHOA, WHAT’S...
ARE YOU AN ALIEN?!

NO WAY, YOU’RE A SEISMIC WAVE? YOU JUST CLIMBED OUT OF THAT SEISMOGRAM!

BUT THEN YOU COULD BE FROM SPACE! THERE ARE SEISMOLOGISTS ON THE MOON AND MARS, TOO.

BUT I REMEMBER THAT I AM DEFINITELY FROM HERE.
I AM BORN OF MOVEMENT. I ORIGINATED AT THE POINT WHERE THE OCEAN FLOOR RUPTURED, GRINDING UNDER THE PRESSURE OF TWO GIANT PLATES OF THE EARTH.
FROM THIS FAULT, I STARTED MY JOURNEY...
The increasing pressure and temperature closer to the core of the Earth changes the mineral contents of rocks and the inner structure of each mineral that forms the Earth's crust and mantle.

As a result, these changes increase the density and strength of minerals, which in turn causes the velocity of seismic waves to increase from the surface towards the boundary between the Earth's core and mantle.

The velocity of the seismic wave within the Earth changes depending on the characteristics of the rock.
ON THE WAY, I PASSED A BOUNDARY, WHICH CHANGED THE DIRECTION OF MY MOVEMENT. I ALSO LOST SOME OF MY STRENGTH.

AND THEN I EVENTUALLY SANK DOWN. THE ENVIRONMENT WAS SUDDENLY MORE VISCOUS, AS IF IT WERE MELTED.

HOW RELIEVED I WAS ONCE EVERYTHING AROUND ME WAS SOLID AGAIN! I RAN FASTER AND FASTER!

I SAW SOMEONE BEHIND ME...

SHE WAS LIKE MY SHADOW! YET ALSO DIFFERENT...
I RAN THE FASTEST I HAD DURING MY ENTIRE EXISTENCE!
WHEN SUDDENLY... CRASH!

AAA!!

I COULD HARDLY MOVE!
I KNEW THAT IF I WERE TO STOP IN THAT GLOWING SLUDGE, I WOULD DISAPPEAR.

I MUST GET AWAY!

BUT WHAT ABOUT THE OTHER ONE?
SHE PROBABLY DIDN'T MAKE IT...
SHE PERISHED!
I got to the centre of it all.
And although it was still hot in there, everything around me was solid, and I could run well.

Then something flashed behind me! It looked like the other one.

And I saw some strange snakes. What were they? My hair stood on end!
IS THAT YOU? I THOUGHT YOU DISAPPEARED! AND YOU CAME BACK! BUT HOW...?

HERE, AT THE BOUNDARY, I ROSE FROM SOME OF YOUR STRENGTH. LOOK!

WHO ARE YOU?

I AM YOUR SISTER!
HEY, WHERE ARE YOU RUNNING TO SO FAST?

YOU KNOW THAT WE CAN’T STOP...
A mantle plume is a narrow area where hot material rises towards the Earth's surface.

THEN, I WEAKENED AGAIN... I LOST A LOT OF STRENGTH ALONG THE WAY...

IT WAS TOO HOT. I SLOWED DOWN. I WAS SCARED THAT I WOULD NOT MAKE IT, THAT I WOULD NOT GET OUT. THAT I COULD NOT RUN AS FAST AS I COULD AT THE START...

BUT I WAS REALLY STRONG WHEN I WAS BORN!

AND THIS STRENGTH DOES NOT JUST DISAPPEAR, THIS MOTION DOES NOT STOP!
FOR A WHILE, I COULD RUN BETTER.

BUT THEN, THAT HEAT AGAIN... PLUS, IT WAS PARTIALLY LIQUID!

A continental plate, the edge of which is deformed and metamorphosed by the pressure of two plates pushing each other. An ocean plate slides under a continental plate.

The upper mantle

The lower mantle

Globules of melt

Molten rock
The rocks of the mantle melt at this point, thanks to the presence of water that is released when the oceanic crust slides under the continental crust.

**NOW WHAT?**

**DON'T WORRY, EVERYTHING WILL BE FINE!**

**HOW DO YOU KNOW? AND WHO ARE YOU?**

**I AM LIKE YOU. BUT I CAME FROM ABOVE, FROM THE VOLCANO. THIS HOT AREA WILL SOON END.**
Magma chamber, where the magma collects before it rises to the surface.

The conduit through which magma rises to the surface.

A volcanic eruption caused by rising magma.

LOOK! YOU WILL SOON BE AT THE SURFACE.
AND HOW DID YOU MAKE IT ALL THE WAY HERE?

I RAN ALL THE WAY TO THE SURFACE - AND THEN...

...EVERYTHING STARTED TO QUAKE.

THIS SHAKING IS ME, THE P-WAVE! AND I CAN DO THIS, FOR EXAMPLE...
DO YOUR POWERS ALSO WORK IN SPACE?

THEY WORK ONLY IN PLACES WHERE THERE IS MASS.

I TOLD YOU! WE CAN MEASURE WAVES LIKE YOU ON MARS AND ON THE MOON, TOO!
SO...

LOOK!

THAT’S MY SISTER, S-WAVE!

WE FINALLY MEET AGAIN!

I WAS SCARED THAT SOMETHING HAPPENED TO YOU!

I MISSED YOU. I TRIED TO CATCH UP WITH YOU, BUT YOU ARE TOO FAST.
Hey sisters, there you are!
That was some havoc we wreaked, huh?

Harvoc? Who are you?

We separated from you at the surface.
We are your brothers, surface waves!

We ran after you, but on the surface, not through the earth.
And together, we made everything in our paths shake...
... WE CAUSED AN EARTHQUAKE!
AND WE SAW THE OCEAN FLOOR RUPTURE IN THE PLACE THAT PEOPLE CALL THE PACIFIC OCEAN.

THE OCEAN FLOOR? THAT IS HOW TSUNAMIS ARE FORMED! WHAT ABOUT MUM AND DAD?!

BUT WE DIDN’T MEAN TO! WE JUST RAN IN ALL DIRECTIONS; WE CANNOT MOVE IN ANY OTHER WAY...

DON’T WORRY. THERE IS A TSUNAMI EMERGENCY WARNING SYSTEM IN HAWAII!

BUT WHAT IF NO ONE NOTICED THE WARNING? WE NEED TO CALL THEM IMMEDIATELY!
TSUNAMI?! WE MUST WARN EVERYONE AND RUN!!!