## WHEN THE EARTH QUAKES

RULES

Number of players: 1-4

Good luck!

oceanic plate

volcanic asł

What you need: four game pieces of the same colour for each player, a six-sided die



The Moon! But you are not alone. You feel other waves, weak ones, caused by the gravitational pull of the Earth, changes in temperature, and impacts of meteorites. Perhaps you will be able to return to Earth. Throw the die twice. Once the sum of the throws equals more than ten, go back to the previous space. Until then, you can't move any wave.

volcanic bom

There is an earthquake, the waves that are created by it want to get to the Seismology Station. Each of them moves forward at different speeds and through various environments. You have one game piece representing the P-wave, one representing the S-wave, and two representing the surface waves. The objective is to be the first player to reach the finish, but how?

Throw the die. Once you have thrown the die, decide which wave you would like to move. The P-wave moves on the round spaces, and because it is the fastest, multiply the number on the die by two (for example, if you roll a five, you move ten spaces). The S-wave moves on the triangular spaces by the number thrown on the die. Both surface waves move on the squares, and as they are the slowest, even numbers are divided by two (for example, if you roll a three, you move three spaces, but if you throw a four, you divide it by two and move forward two spaces). Then the next player makes their move. You move only one wave in each round.

But beware of the mysterious disruptions in the time-space continuum, which can send you to space!

solid inner

FINISH

liquid outer core

> convection within outer core

You find yourself at the plate boundary. Here, an oceanic plate slides under a continental plate (known as subduction). This is a place where volcanic activity and earthquakes frequently occur – and the shaking stars you on your way.

> magma chambei

mantle plume



You are flying to Mars. A planet that probably has a core that is entirely solid, so, as an S-wave, you will not dissipate here. You must wait until InSight's seismometer detects you, sends a message to Earth, and then you can crawl out of the seismogram directly at the finish. You need to throw two sixes in a row, until then, you do not move any of your waves.

> shipment from overseas

You find yourself on Jupiter's moon, Europa, whose surface is made of broken-up ice blocks. Does plate tectonics exist here, too? Explore this until you throw a six, which returns you to the previous space.

 $\prec$ 

boat

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Oh no! You find yourself on Jupiter, surrounded by a gaseous atmosphere, under which there is liquid and metal hydrogen, and possibly a solid core. We don't know yet. You want to learn more, and you dig so deep that you forget about the Earth. Go back to start.

illustration: Karolina Kučerová / concept: Petr Brož a Matěj Machek / gamedesign and text: Julie Nekola Nováková The game is a part of comics When the Earth Quakes, The Story of a Seismic Wave / License CC BY-SA 4.0. 2020 GFU a Karolina Kučerová / www.ig.cas.cz/komiks 4: Microquakes caused by storms and winds on the ocean ruffle your hair. What a pleasant run! Before you know it, you find yourself on the purple space at the opposite corner of the world.

5: You run into your cousin from the volcano, and you have a race. Move ahead three spaces.

6: Look! This is the same type of fault as the one where you originated! You find yourself daydreaming, and you lose a turn.

7: You are crossing a mid-ocean ridge. The plates here diverge, creating a new seafloor. Go back four spaces.

1: You are travelling through

a mantle plume! The hot material slows your progress. You lose a turn.

2: You run into a section of the

eight spaces.

oceanic crust that is falling into the

mantle. You bounce off it. Go back

3: You dissipate at the boundary

with the outer liquid core since

S-waves do not travel through

liquid. However, you have the

chance of being reborn at the

P-wave lands on the red space,

boundary from the strength of your

sister, P-wave. Either wait until your

then move to the red space, or you

can return to the start at any time.

8: You run into a mountain range created by subduction, when one continental plate slides under another. The pressure - and the peaks! You cause small landslide, moving you one space forward.

9: You bounce off the boundary and lose some of your power. Go back two spaces. This applies only to the P-wave, and not the S-wave generated at the boundary.

10: You are going through a low-velocity zone. Go back one space.