

SHAKE IT UP! (LEVELS 2 AND 3)

Ages 8 to 10 (Level 2)

Description:	Learners will begin to understand the way the Earth is designed as tectonic plates, how mountains form, what earthquakes are and how we respond to them!
Leading question:	
Age group:	8 - 10-year old
Subjects:	Social StudiesLanguageArt and Design
Total time required:	4 hours total over 5 days
Self-guided / Supervised activity:	Low supervision by parents / guardians
Resources required:	Pens – Paper, Orange Plastic covers of containers, A large tub Cardboard, Scissors, Styrofoam, Glue Preferred: A World Map

Day	Time	Activity and Description
1		Do you think the ground beneath our feet is moving? Can you feel it move? Let's learn about it!
	10 minutes	Learners will reflect on how they think the Earth's surface and continents are formed. • Learners will understand that our Earth is made up of slowing
		moving pieces called plates that are floating on a hot liquid. Our homes and even our oceans are on top of these plates, which are on top of this hot liquid.
	10	These have moved over the millions of years to form the Earth with its continents, oceans, mountains and ridges as we know it today
	minutes	Learners will take an orange that represents the Earth, they will tear pieces of the peel – each of the peel pieces represent one plate and the orange below represents the hot liquid underneath
	10 minutes	Learners will take a few small plastic covers (or any material that floats) and float this on a tub of water. The way these plastic covers move like the Earth's plates move but much more slowly



		<u> </u>
	10 minutes	Learners will reflect on the fact that the land they stand on is moving and how slowly it moves that they cannot feel it
2		Learners will think about how the Earth is like a jigsaw puzzle
	30 minutes	Learners will draw and design their own map of the Earth as a jigsaw puzzle with 8 pieces on Styrofoam or Cardboard (representing the 8 large plates). They will draw this based on the below or their own imagination of the various continents
		World Flate North America Plate Ouan de Fluca Plate Plate Plate Plate Arican Plate Arican Plate Plate Plate Plate Arican Plate Arican Plate Plate Plate Arican Plate Arican Plate Arican Plate Plate Arican Plate
	10 minutes	Learners will paint over their world map with blue representing the oceans and label the ones that they know
	10 minutes	Learners will depict the continents and land in green or a chosen colour and label the ones that they know
3		Learners will begin to understand different ways that these pieces move and form earthquakes and mountains
		Learners will understand how these plates slide over each other to cause friction that in most cases creates Earthquakes
	15 minutes	Learners will place their hands-on top of each other palms facing downwards. The palm of their upper hand should be touching the back of their other hand. They will now rub their hands in this position and notice how their left hand moves to the right and right hand moves to the left. This heat created when the hands rub represents the friction created when the pieces slide over each other. In most cases this creates an earthquake as the crust shakes
	15 minutes	Learners will be exploring how mountains are formed, which happens when two plates bump into each other • Learners will hold up both their hands touching at the fingertips as shown in step 1. Each of their hands represents a different tectonic plate. Learners will then push their hands together from their wrists as shown in step 2 and observe how their fingers move upward to form a mountain as shown in step 3 (see images below for



clarification). This is representative of two plates other – this is how the Himalayas and other mouwhen plates crashed against each other Step 1:	
Step 2	
Step 3	
15 minutes	
Learners will try and draw the two types of movements a geographical features that are created	and the
Learners will try and create structures that are Earthqua	ke resistant
Learners will use styrofoam (thermocal) as a bas tower of any materials available at home such as cups	
 Learners will design two towers: 	



		G
		 The first tower will be deeply embedded into the base and have a broader base. Learners can use toothpicks, pins etc. to secure the tower into the base. The second tower will not be as embedded into the base and has a narrower base
		Tip: Learners can be encouraged to experiment with different types of towers
	10 minutes	Learners will try and shake the Styrofoam base to test which of the towers will not fall during an Earthquake
	10 minutes	Learners will reflect on what makes towers more resistant and write this down
5	20 minutes	Learners will begin to think about how they would react in their home if there is an Earthquake. What emergency response plan would they put into place • Prompts: How would you ensure all the family members leave the home or stay safe? How can we ensure everyone leaves in an orderly fashion? Etc.
	minutes	Learners will present their jigsaw puzzle and reflections with their family
Assessment Criteria:		- Understanding of plates and movement - Representation of how geographical features - Designing maps and jigsaw puzzles

Learning outcomes:	 Tectonic plates and layers of the Earth Movement of the tectonic plates Formation of geographical features Earthquake resistant structures
Required previous learning:	Basic knowledge on the world map
Inspiration:	None
Additional enrichment activities:	None

Ages 11 to 14 (Level 3)

	Learners will begin to understand the way the Earth is designed as tectonic plates, how mountains form, what earthquakes are and how we respond to them!
Leading question:	
Age group:	11 - 14-year old



- Social Studies
- Language
- Art and Design
5 hours total over 5 days
Low supervision by parents / guardians
Pens – Paper,
Orange
Biscuits / Clay, Tub
Desks / Tables
Cardboard, Scissors, Styrofoam, Glue
Extension Materials: Vinegar, Baking Soda, Empty Plastic Bottle and a
World Map

Day	Time	Activity and Description
Day 1	Time 10 minutes	Activity and Description Learners will reflect on how they think the Earth's surface and continents formed Learners will understand that our Earth's outer shell (also called the lithosphere) is made up of different layers of crust that are slowly moving as they are floating on the mantle (the hot liquid) under the crust might be useful to illustrate https://science4fun.info/composition-of-the-earth/ Crust Mantle Outer Core Inner Core
	10 minutes	There are 7 – 8 major plates and many minor plates that together make up our Earth's crust. To help visualize these plates, think of pieces of a broken eggshell! These have moved over the millions of years to form the Earth with its continents, oceans, mountains and ridges as we know it today All the continents in the world were together as one super continent called Pangea



Learners will take an orange that represents the Earth, they will tear 8 pieces of the peel – each of the peel pieces represent one tectonic plate and the orange below represents the layers under the crust

10 minutes

Learners will take pieces of biscuit, clay or any object that floats and create minor cracks on the surface without breaking them into pieces. Alternatively, they will take a few small plastic pieces (each representing a different tectonic plate)

Learners will take a tub of water and float the biscuit, clay or other object on a tub of water.

Learners will observe how the pieces keep moving just like the Earth's crust. The way these biscuit or clay pieces split, and move is just how the Earth's super continent Pangea split into the current different continents

30 minutes

Suggested extension activity - If learners have access to a map to cut or copy: Try and cut out each of the continents and put them together – as a super continent: Pangea. If they do not have access to a map, they can draw out the continents and try and see whether they fit together

10 minutes

Learners will draw and design their own map of the Earth as a jigsaw puzzle with 8 pieces on Styrofoam or Cardboard (representing the 8 large tectonic plates). They will draw this based on the below or their own imagination of the various continents

Learners will write down their reflection on their experience





		العاد المختاع العاد المتاد
		World Flate North America Plate Caribbean Plate Caribbean Plate Arabian Plate Plate Plate Antarctica Plate
2	5 minutes	Learners will begin to understand the different types of movement of the plates and the geographical features such as mountains, earthquakes and
		 We will first learn about ridges that are caused by divergent plates that is plates that move away from each other.
	15 minutes	Learners will place two desks or tables with their ends touching each other - these represent two tectonic plates that are moving away from each other and the papers represent the magma underneath that will form new crust in the gap that is made by the separation of the plates
	15 minutes	 Place two pieces of paper vertically into the gap between the desks. Leave just enough of the papers sticking out so that there is something to pull out Learners should slowly pull the papers out from the gap, spreading the papers apart onto the desks as they go. Make sure that both papers are pulled at the same speed
		Learners can use a pen to draw a stripe of color on both pieces of paper at the ridge. This stripe of color represents the new rock that is formed at the ridge.
		 Learners can continue to pull the papers and draw more stripes in alternating colors to represent subsequent time periods. Learners should make sure each new stripe extends on both pieces of paper. The result should be a mirror-image set of colored stripes, representing how the new crust forms as an ocean floor as two plates move away from one another.
		Learners will also understand about transformative plates that slide over each other to cause friction that in most cases creates Earthquakes
	15 minutes	Learners will place their hands-on top of each other palms facing downwards. The palm of their upper hand should be touching the back of their other hand. They will now rub their hands in this position and notice how their left hand moves to the right and right hand moves to the left. This heat created when the hands rub represents the friction created when the transformative plates slide over each other. In most cases this creates an earthquake as the crust shakes



		Carrier 1 am
	10	Tip: One of the reasons that earthquakes often happen in the same places is because these places are on the fault lines that mark the boundaries between plates
	minutes	Learners will try and draw the two types of movements and the geographical features that are created
3		Insert diagram Learners will continue exploring what happens when plates collide to understand how mountains are formed and earthquakes happen
		Learners will also understand convergent plates of how they collide with each other
	15 minutes	Learners will hold up both their hands touching at the fingertips as shown in step 1. Each of their hands represents a different tectonic plate. Learners will then push their hands together from their wrists as shown in step 2 and observe how their fingers move upward to form a mountain as shown in step 3 (see images below for clarification). This is representative of two plates colliding with each other – this is how the Himalayas and other mountains were formed when plates crashed against each other Step 1:
		Step 2



	1	
	10 minutes	Suggested Extension Activity: If the resources are available: Learners will now create their own volcanoes that are mountains with open holes on the top. Since under the plates of the Earth there is molten magma, this comes out in the form of lava. • Learners will combine 400 ml of vinegar, 100 ml of cold water and 10 ml of dish soap in an empty bottle. In a separate cup they will fill it halfway with baking soda and halfway with water and stir it to a liquid consistency. • Learners will need to be careful of the explosion and now add the baking soda liquid to the bottle. This will cause an explosion this is what an explosion is. this represents the lava that comes out of volcanoes when they erupt
		Learners will write down and represent this in diagrams
4	40 minutes	Learners will try and create structures that are Earthquake resistant
		Learners will use Styrofoam (thermocal) as a base and construct a tower of any materials available at home such as plastic or paper cups
		Evaluation Learners will design two towers: The first tower will be deeply embedded into the base and have a broader base. Learner can use a toothpick, small stick, pin or any other small sharp object to secure the tower to the base. The second tower will not be as embedded into the base and has a narrower base.
		Tip: Learners can be encouraged to experiment with different types of towers
	10 minutes	Learners will try and shake the Styrofoam base to test which of the structures is more resistant to collapsing during an Earthquake



	10 minutes	Learners will shake the base with different levels of intensity to represent different magnitude or strength of Earthquakes Learners will reflect on what makes structures more resistant and write this
		down
5	20 minutes	Learners will begin to think about how they would react in their home if there is an Earthquake. What emergency response plan would they put into place
		Prompts: How would you ensure all the family members leave the home or stay safe? How can we ensure everyone leaves in an orderly fashion? Etc.
	40 minutes	Learners will put together all their understanding in the form of basic diagrams and text as a chapter of a schoolbook to explain this to their younger siblings
Assessment		- Understanding of plates and movement
Criteria:		- Representation of how geographical features - Designing maps and jigsaw puzzles

Learning outcomes:	 Tectonic plates and layers of the Earth Movement of the tectonic plates Formation of geographical features Earthquake resistant structures
Required previous learning:	- Basic knowledge on the world map
Inspiration:	None
Additional enrichment activities:	None