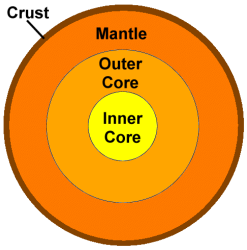
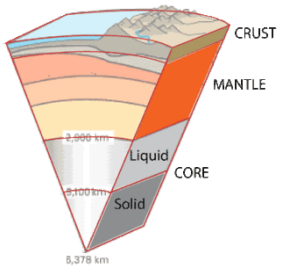
Shake it up!

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:	How would you keep your community safe if there was an Earthquake?
Age group:	8 - 10-year old
Subjects:	- Social Studies - Language - Art and Design
Total time required:	4 hours total over 5 days
Self-guided / Supervised activity:	Medium supervision by parents / guardians
Resources required:	Pens – Paper Boiled egg Orange Plastic covers of containers, A large tub Cardboard, Scissors, Styrofoam, Glue 2 desks or tables, 1 coin, Pencil or Marker A stack of heavy books, A ruler, A piece of cardboard, 3 rubber bands, and paper Preferred: A World Map

Day	Time	Activity and Description
1	25 minutes	Learners will begin by learning the earth's composition and the different layers that make up the earth. Educators/parents will explain to the learner(s) that it may seem like the Earth is made up of one big solid rock, but it's really made up of several parts. Some of them are constantly moving! You can think of the Earth as being made up of several layers, sort of like an onion. See the picture below to see the four main layers of the earth: the crust, mantle, outer core, and inner core.

	10 minutes	 Obtained from: https://www.ducksters.com/science/composition_of_the_earth.php  Obtained from: https://www.usgs.gov/natural-hazards/earthquake-hazards/science/science-earthquakes?qt-science_center_objects=0#qt-science_center_objects ● 1st layer - Crust: The crust is the thin outer layer of the Earth where we live. The crust varies from around 5km thick (in the ocean floor) to around 70km thick (on land where we live called the continental crust). This is where we live, on pieces called plates. ● 2nd layer - Mantle: The next layer of the Earth is called the mantle. The mantle is much thicker than the crust at almost 3000km deep. ● 3rd Layer – Core ● Outer Core: The Earth's outer core is made up of iron and nickel and is very hot (4400 to 5000+ degrees C). This is so hot that the iron and nickel metals are liquid! ● Inner Core: The Earth's inner core is made up of iron and nickel, just like the outer core, however, the inner core is different. The inner core is so deep within the earth that it's under immense pressure. So much pressure that, even though it is so hot, it is solid. **Layers of the Earth Activity:** Learner with the help of the parent will boil an egg.

		Step 1: With the boiled egg, begin by peeling the shell of the egg off. Ask the learners to think about the shell like the first layer of the earth. What is the first layer of the earth? *(Answer: The Crust).*  Step 2: The next layer of the egg is the white of the egg. It is the middle layer. Ask the learners to think about the white of the egg as the second layer of the earth. What is the second layer of the earth? *(Answer: The mantle)*  Step 3: The only portion of the egg remaining is the layer at the center of the egg. Ask the learners to think of this layer as the last two layers of the earth combined. What is the last (inward) layer of the earth? *(Answer: The core)* 

	10 minutes	**Reflection**: Thinking about the activities today, can you tell us: - Two things you have learned from today - One thing you found interesting - One thing that you still have a question about Parents/educators will ensure to respond to the learner's question where possible.
2	40 minutes 10 minutes	Learners will think about how the outer crust of the Earth is like a jigsaw puzzle Learners will draw and design their own map of the Earth as a jigsaw puzzle with 15 pieces on a piece of paper or Cardboard (representing the 15 plates). They will draw or trace one below or their own imagination of the various continents.  Learners will paint over their world map with blue representing the oceans and label the ones that they know. Learners will depict the continents and land in green or a chosen color and label the ones that they know. Educator will then explain to the learner(s) that the jigsaw puzzle pieces drawn above represent the tectonic plates of the earth. A tectonic plate is a massive, irregularly shaped slab of solid rock, generally composed of both continental and oceanic surface. The tectonic plates are a combination of **the crust** and **the outer mantle.** Ask learners to come up with wanderings based on what they've learned. Some possible questions include: - What is the largest tectonic plate? - What is the smallest tectonic plate?On what tectonic plate is your country and home found?
3		Learners will begin to understand that the earth surface is always moving and different ways that these pieces move and form earthquakes and mountains.

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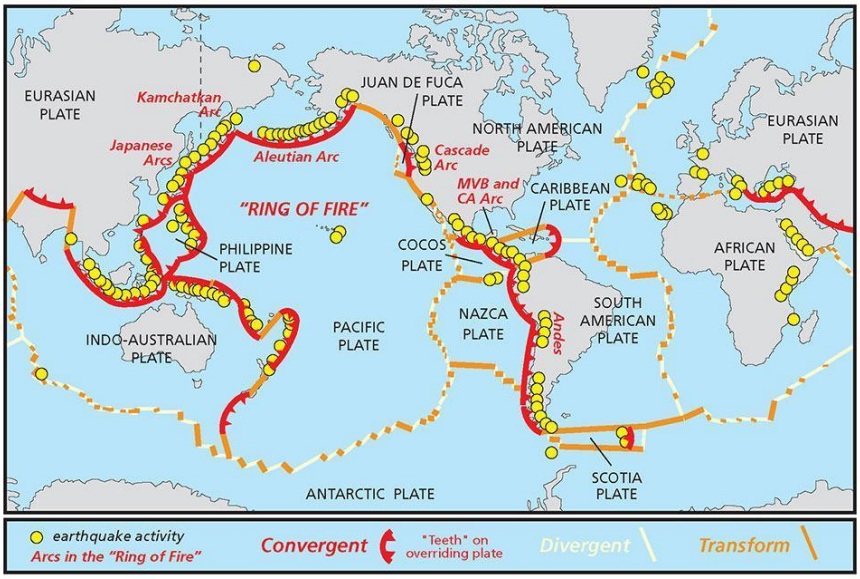
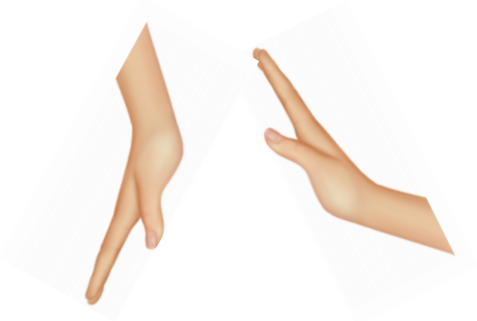
	15 minutes 15 minutes 15 minutes	Ask the learner to step on the ground. Ask the learner: Do you think the ground beneath our feet is moving? Can you feel it move? Let's learn about it! Explain to the learner that even though we can not feel it, tectonic plates move less than 3 inches (about 17 cm) per year. These plates slide over each other to cause friction that in most cases creates Earthquakes and mountains. Show the learners the map below. Invite learners to tell you what they see - at the descriptive level, without any interpretation (e.g. "I see some yellow dots along some lines'', "I see some pieces of the image that are colored in blue"), think (e.g. "I think the yellow dots might be indicating something about the plates''), and wonder (e.g. "Why are the no dots in the east coast of North America?") in relation to the map.  Tell them that the map shows places where the earthquakes have occured (yellow dots). Then ask: - What do you notice about the distribution of earthquakes? - Do you see any patterns? - Can you think of a possible explanation for the patterns you see? Earthquake exercise: - 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

	10 minutes 10 minutes	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 Mountain formation exercise: 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 colliding with each other – this is how the Himalayas and other mountains were formed when plates crashed against each other Step 1:  *Step 2*  *Step 3* 

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		Literacy extension and check for understanding: Ask the learner to identify a mountain in their country or region or continent. Using the information learned today, can you write a short paragraph explaining how the mountain was formed?
4	10 minutes 10 minutes 40 minutes 10 minutes 10 minutes	Ask the learner: Have you ever experienced an earthquake? If yes, what did it feel like? If not, then the learner can interview their parents or an adult at home if they have ever experienced an earthquake and ask them to explain to them what it feels like. Educator/parent will explain to the learner that some earthquakes are small, while others could be big and could destroy a house or an entire village. Today learners will try to create structures that are Earthquake resistant. Learners can hypothesize, check online, or ask their parents/an adult at home about the danger and destruction a big earthquake can cause to a building or a place with weak structures. Learners will first write their hypothesis on whether shorter or taller buildings are more Earthquake resistant. Prompt: Have you ever climbed a tree? Or observed a tree shaking? When it is windy, what part of the tree shakes more? Hint: All buildings shake at the same frequency as the shaking of the Earth, but the movement is magnified as the building gets taller. Learners will make their own shake-tables to learn about strong and weak buildings through experimentation. Learners can build a paper house can from 3-cm wide strips of paper, scissors, and tape, as shown in the figure.  Learners can insert their hands into the base of the building and slide the building back and forth to see how the paper house sways and even collapses. Using extra sheets or paper, learners can then experiment with methods of strengthening their building by cutting out and taping paper walls, paper X shaped braces, or interior columns to their building. Older students can try building houses of two or three stories to determine how height affects a building in an earthquake or cyclone Learners will use styrofoam (thermocol) as a base and construct a tower of any materials available at home such as paper or plastic cups ● Learners will design two towers:

	10 minutes 10 minutes	- 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* Learners will try and shake the Styrofoam base to test which of the towers will not fall during an Earthquake **Critique and revision:** **Learners** present and test the various structures developed to their parents or family members for feedback and suggestions for improvement. The parents or family members provide feedback using the following format: ● Praise: What did you like about the learner's work done? ● Question: Any questions or clarifications you have about the work? ● Suggestions: In what areas does the learner need to improve their work? Learners will reflect on what makes towers more resistant and write this down. Learners can consult the internet or their parents or an adult in their family if they are not sure of the responses. Some of the answers may include: - Reinforced walls - Stronger and deeper building foundation - Light roof
5	10 minutes 20 minutes	Learners will design their home emergency plan in the case of an Earthquake Ask the learners: Imagine a violent shaking of the ground for a prolonged period of time, what do you need to do to make your house safe? Learners can either check on the internet or ask their parents/adults in case they are not sure what to do in case of an earthquake. Possible responses: - Secure or reorganize the different household items to ensure safety - Create a family communication plan - Create an evacuation plan - Know the safe spots within each room - Hold family drills - Etc. Learners will first need to identify the potential dangers around them in times of an Earthquake. Imagine a violent shaking of the ground for a prolonged period of time, what would be hazards in their home?

20 minutes

Prompts: What are the household items that are loosely attached and can fall easily? E.g. lose furniture etc. What are the items that can cause injury? E.g. hanging lights, windows etc.? What items have wheels and might move and hurt individuals?

Learners can make a list of the items in their home and decide how to make their home safer. They would draw three columns: 1) Household item, 2) Danger posed, 3) If an earthquake occurs: move, relocate, attach, anchor, replace, remove, fasten, secure, tie down, eliminate and change.

S.No	Household Item	Hazard Posed	If an Earthquake occurs
1	Heavy Books on the Shelf	Heavy items can be displaced and can fall	Move the heavier items to the lower shelf
2	Hanging Glass Chandelier	Glass can be injurious	Secure the light and move bed or table from under this light
3	Lose Chest of Drawers	Not attached to the wall and can fall	Attaching the cabinet to the wall

The learners will make a plan for their family with suggested changes to ensure they are aware of the hazards

Learners will now create a plan for evacuation or staying safely at home during an Earthquake.

Given that Earthquakes can last as long as 2 – 3 minutes and be followed by aftershocks or smaller Earthquakes, what would learners consider the correct safety protocol to be?

-For those outside the home:

i) Where do you think is the correct outdoor location? How would you stay away from potential hazards such as buildings and power lines? (Answer: Please move to open land and spaces with no danger)

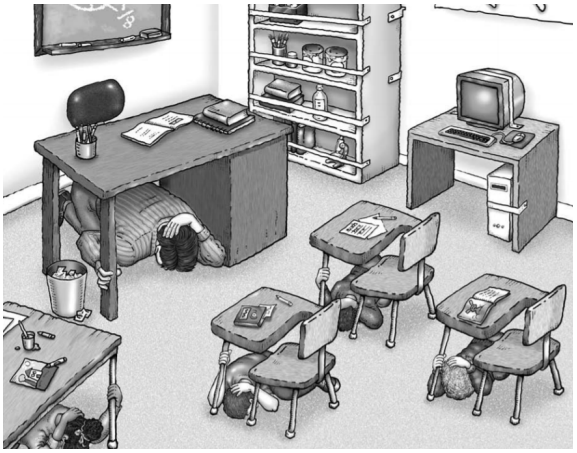
ii) Given a potential aftershock or damage at home, when do you think is the right time to return to your home? (Answer: Please do stay outdoors and only re-enter home only after secured by authorities)

15 minutes

For those who are inside the home,

i) Would it be possible to evacuate the building during a quake of that length? (Answer: No, because there is not enough time)

ii) What would be some of the hazards along the way if we tried to leave the building during a quake? (Answer: objects falling, windows breaking)

	10 minutes	iii) When should learners evacuate given the potential for an aftershock? (Answer: they should seek cover until at least a full minute has passed without shaking) iv) Where in your home should you be located to be safe from household items falling or injuring you? (Answer: Away from windows and other lose or precarious items) v) What is the best position to stay safe from injury? How will you protect your eyes, face and critical organs of heart and lungs? (Answer: Crouch bending their heads to their knees and put both hands on the back of your neck) vi) What in your home can be used as a shield to prevent injuries from shattered glass and debris? (Answer: Under a table and desk or using coats or thick blankets as a shield from glass or debris)  **Critique and revision:** Learners present their understanding of earthquakes and their emergency preparedness plan with their families developed to their parents or family members for feedback and suggestions for improvement. The parents or family members provide feedback using the following format: ● Praise: What did you like about the learner's work done? ● Question: Any questions or clarifications you have about the work? ● Suggestions: In what areas does the learner need to improve their work? Reflection: Thinking about the activities from the entire week, can you tell us: - Three things you have learned from all the week's activities - Two things you found interesting - One thing that you still have a question about
		- Understanding of tectonic plates and their movement and how that creates earthquakes.

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Assessment Criteria:	- Representation of how geographical features are formed. - Designing maps and jigsaw puzzles - Drawing up the emergency preparedness plans

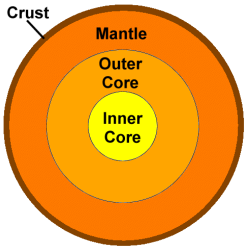
Topics/concepts covered	- Earth formation - Tectonic plates and layers of the earth - Earthquakes - Formation of geographical features - Drawing maps and making jigsaw puzzles - Emergency preparedness plan Critical thinking, creativity and communication skills
Learning outcomes:	- Understand how tectonic plates and the various layers of the Earth are related to earthquakes and graphical features. - Learners will explore ways in which they can develop earthquake resistant structures - Learners will be able to identify any risks or dangerous areas and items within their homes and come up with Develop earthquake preparedness protocols for their homes.
Required previous learning:	Basic knowledge on the world map
Inspiration:	None
Additional enrichment activities:	EARTHQUAKE MEASUREMENT Learners will reflect on the fact that the land they stand on is moving and how slowly it moves that they cannot feel it. Learners will measure the impact of earthquakes by designing their own Seismograph instruments. Seismographs are instruments used to record the motion of the ground during an earthquake. Step 1: Place the tables or desks side by side. Stack the books on top of the piece of cardboard on one desk. Step 2: Insert the ruler or any long thin stick between two books near the top of the stack. The ruler should stick out over the adjacent desk. Step 3: Hang the pencil or marker from the end of the ruler using three rubber bands and the coin if needed for extra weight. The marker or pencil should touch a piece of paper placed under it on the adjacent desk when the cardboard is moved. The first desk represents the place where the earthquake is occurring.

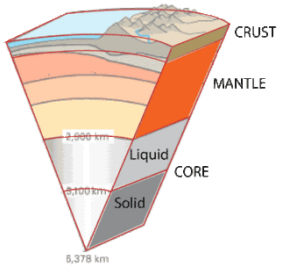
	A family member can make the earthquake occur by shaking the cardboard back and forth towards the second desk. The pen will move as this earthquake occurs. The second desk represents the recording station. Learners can record the earthquake by slowly pulling the paper underneath the marker while the cardboard is being shaken. This record that the seismograph creates is called a seismogram. Learners should simulate 3 to 5 earthquakes and then make a hypothesis on reading the seismogram. Hint: The tallest wave represents the Earthquake with the maximum intensity (or magnitude)

Ages 11 to 14 (Level 3)

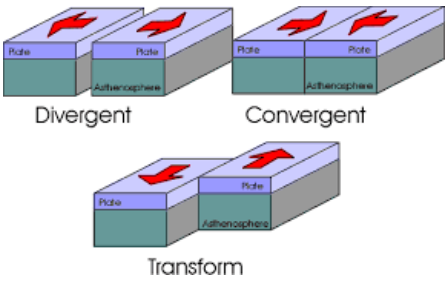
Description:	Learners will begin to understand the way the Earth is designed as tectonic plates, how mountains form, what earthquakes are and how we respond to them!
Leading question:	How would you keep your community safe if there was an Earthquake?
Age group:	11 - 14-year old
Subjects:	- Social Studies - Language - Art and Design
Total time required:	5 hours total over 5 days
Self-guided / Supervised activity:	Low supervision by parents / guardians
Resources required:	Pens – Paper, Orange Biscuits / Clay, Tub Desks / Tables Cardboard, Scissors, Styrofoam, Glue 2 desks or tables, 1 coin, Pencil or Marker A stack of heavy books, A ruler, A piece of cardboard, 3 rubber bands, and paper Extension Materials: Vinegar, Baking Soda, Empty Plastic Bottle and a World Map

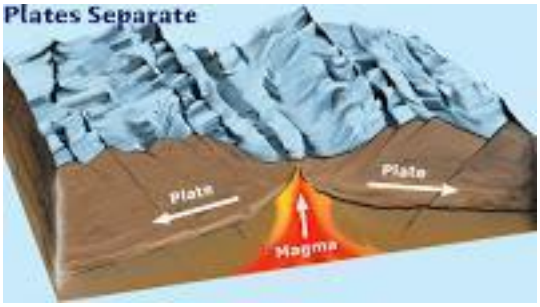
Day	Time	Activity and Description
1	15 minutes	Learners will reflect on how they think the Earth's surface and continents formed. Learners will take pieces of biscuit, clay or any object that floats and create minor cracks on the surface without breaking them into pieces. Learners will take a tub/cup/bowl of water and float the biscuit, clay or other object on a tub of water. Learners will observe how the pieces keep splitting into smaller pieces just like the Earth's crust. The parent/educator will then explain to the learner(s) that the way these biscuit or clay pieces split, and move is just how the Earth's supercontinent Pangaea split into the current different continents. The educator can thenshow the learners the image below demonstrating how earth was one big continent called Pangaea at the beginning and then it split into different continents.

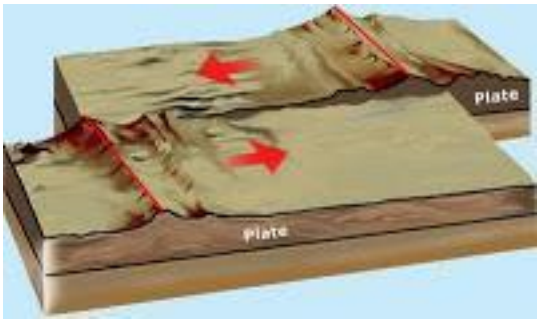
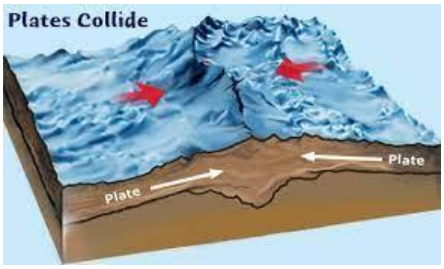
	30 minutes	 Educators/parents will explain to the learner(s) that it may seem like the Earth is made up of one big solid rock, but it's really made up of several parts. Some of them are constantly moving! You can think of the Earth as being made up of several layers, sort of like an onion. See the picture below to see the four main layers of the earth: the crust, mantle, outer core, and inner core. 
	30 minutes	Obtained from: https://www.ducksters.com/science/composition_of_the_earth.php

	20 minutes	 Obtained from: https://www.usgs.gov/natural-hazards/earthquake-hazards/science/science-earthquakes?qt-science_center_objects=0#qt-science_center_objects ● 1st layer - Crust: The crust is the thin outer layer of the Earth where we live. The crust varies from around 5km thick (in the ocean floor) to around 70km thick (on land where we live called the continental crust). ● 2nd layer - Mantle: The next layer of the Earth is called the mantle. The mantle is much thicker than the crust at almost 3000km deep. ● 3rd Layer – Core ● Outer Core: The Earth's outer core is made up of iron and nickel and is very hot (4400 to 5000+ degrees C). This is so hot that the iron and nickel metals are liquid! ● Inner Core: The Earth's inner core is made up of iron and nickel, just like the outer core, however, the inner core is different. The inner core is so deep within the earth that it's under immense pressure. So much pressure that, even though it is so hot, it is solid. **Layers of the Earth Activity:** Learners will boil an egg with the help of their parents. Step 1: With the boiled egg, begin by peeling the shell of the egg off. Ask the learners to think about the shell like the first layer of the earth. What is the first layer of the earth? *(Answer: The Crust).* 

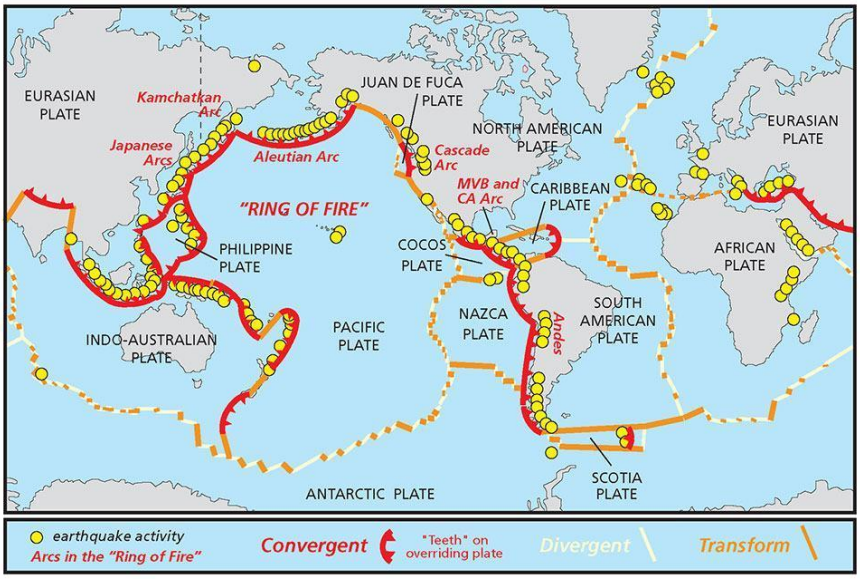
	10 minutes	Step 2: The next layer of the egg is the white of the egg. It is the middle layer. Ask the learners to think about the white of the egg as the second layer of the earth. What is the second layer of the earth? *(Answer: The mantle)*  Step 3: The only portion of the egg remaining is the layer at the center of the egg. Ask the learners to think of this layer as the last two layers of the earth combined. What is the last (inward) layer of the earth? *(Answer: The core)*  Learners will think about how the Earth is like a jigsaw puzzle Learners will draw and design their own map of the Earth as a jigsaw puzzle with 15 pieces on a piece of paper or Cardboard (representing the 15 plates). They will draw or trace one below or their own imagination of the various continents  Learners will paint over their world map with blue representing the oceans and label the ones that they know

		Learners will depict the continents and land in green or a chosen color and label the ones that they know Educator will then explain to the learner(s) that the jigsaw puzzle pieces drawn above represent the tectonic plates of the earth. A tectonic plate is a massive, irregularly shaped slab of solid rock, generally composed of both continental and oceanic surface. The tectonic plates are a combination of **the crust** and **the outer mantle.** **Reflection:** Thinking about the activities today, can you tell us: - Three things you have learned from today - Two things you found interesting - Two questions that you would like to explore further
2	5 minutes 15 minutes 15 minutes	Ask the learner to step on the ground. Ask the learner: Do you think the ground beneath our feet is moving? Can you feel it move? Let's learn about it! Educator/parent explains to the learner that even though we cannot feel it, tectonic plates move less than 3 inches (about 17 cm) per year. These plates slide over each other to cause friction that in most cases creates Earthquakes, mountains and ridges. There are three types of plate boundary movements: - divergent: plates moving apart - convergent: plates coming together - transform: plates moving past each other See diagram below:  Understanding the three different types of movements.

	15 minutes	Tell the learners that we are going to do some experiments to help us understand the different types of movement of the plates and the geographical features such as mountains, earthquakes and ridges Ridges are formed by divergent boundary movements.  We will first learn about ridges that are caused by divergent plates (plates that move away from each other). - 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 - 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.
	15 minutes	Learners will understand how earthquakes are formed by transformative boundary movements.

	10 minutes	 Learners will also understand about transformative plates that slide over each other to cause friction that in most cases creates Earthquakes - 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
3	15 minutes	Learners will continue exploring what happens when plates collide to understand how mountains are formed and earthquakes happen Learners will also understand convergent plates movements when the plates collide with each other and form mountains.  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

	15 minutes	Step 1:  *Step 2*  *Step 3* 
	10 minutes	Show the learners the map below. Invite learners to tell you what they see - at the descriptive level, without any interpretation (e.g. “I see some yellow dots along some lines”, “I see some pieces of the image that are colored in blue”), think (e.g. “I think the yellow dots might be indicating something about the plates''), and wonder (e.g. “Why are the no dots in the east coast of North America?”) in relation to the map.

		 Tell them that the map shows the earthquake (yellow dots) and the different boundary plate movements that have occurred around the world. Then ask: - What do you notice about the distribution of earthquakes? - What do you notice about the distribution of convergent, divergent and transform plate boundary movements? - Do you see any correlations or patterns? - Can you think of a possible explanation for the patterns you see?
4	10 minutes 40 minutes	Ask the learner: Have you ever experienced an earthquake? If yes, what did it feel like? If not, then the learner can interview their parents or an adult at home if they have ever experienced an earthquake and explain to them what it feels like. Educator/parent will explain to the learner that some earthquakes are small, while others could be big and could destroy a house or an entire village. Today learners will try to create structures that are Earthquake resistant. Learners can check online or ask their parents/an adult at home on the danger and destruction a big earthquake can cause to a building or a place with weak structures. Learners will first write their hypothesis on whether shorter or taller buildings are more Earthquake resistant. Prompt: Have you ever climbed a tree? Or observed a tree shaking? When it is windy, what part of the tree shakes more? Hint: All buildings shake at the same frequency as the shaking of the Earth, but the movement is magnified as the building gets taller. Learners will make their own shake-tables to learn about strong and weak buildings through experimentation. Learners can build a paper house can from 3-cm wide strips of paper, scissors, and tape, as shown in the figure.

	10 minutes	 Learners can insert their hands into the base of the building and slide the building back and forth to see how the paper house sways and even collapses. Using extra sheets or paper, learners can then experiment with methods of strengthening their building by cutting out and taping paper walls, paper X shaped braces, or interior columns to their building. Older students can try building houses of two or three stories to determine how height affects a building in an earthquake or cyclone Learners will use Styrofoam (thermocal) as a base and construct a tower of any materials available at home such as plastic or paper cups 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* Learners will try and shake the Styrofoam base to test which of the structures is more resistant to collapsing during an Earthquake Learners will shake the base with different levels of intensity to represent different magnitude or strength of Earthquakes **Critique and revision:** Learners present and test the various structures developed to their parents or family members for feedback and suggestions for improvement. The parents or family members provide feedback using the following format: ● Praise: What did you like about the learner's work done? ● Question: Any questions or clarifications you have about the work? ● Suggestions: In what areas does the learner need to improve their work?

<table>
<tr>
<td></td>
<td>10 minutes</td>
<td>Learners will reflect on what makes structures more resistant and write this down. Learners can consult the internet or their parents or an adult in their family if they are not sure of the responses.

Some of the answers may include:
- Reinforced walls
- Stronger and deeper building foundation
- Light roof
- Etc.</td>
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<tr>
<td>5</td>
<td>10 minutes

20 minutes

20 minutes</td>
<td>Learners will design their community/home emergency plan in the case of an Earthquake

Ask the learners: Imagine a violent shaking of the ground for a prolonged period of time, what do you need to do to make your house safe? Learners can either check on the internet or ask their parents/adult in case they are not sure what to do in case of an earthquake.

Possible responses:
- Secure or reorganize the different household items to ensure safety
- Create a family communication plan
- Create an evacuation plan
- Know the safe spots within each room
- Hold family drills
- Etc.

Learners will first need to identify the potential dangers around them in times of an Earthquake. Imagine a violent shaking of the ground for a prolonged period of time, what would be hazards in their home?

Prompts: What are the household items that are loosely attached and can fall easily? E.g. lose furniture etc. What are the items that can cause injury? E.g. hanging lights, windows etc.? What items have wheels and might move and hurt individuals?

Learners can make a list of the items in their home and decide how to make their home safer. They would draw three columns: 1) Household item, 2) Danger posed, 3) If an earthquake occurs: move, relocate, attach, anchor, replace, remove, fasten, secure, tie down, eliminate and change

<table>
<tr><td>S.No</td><td>Household Item</td><td>Hazard Posed</td><td>If an Earthquake occurs</td></tr>
<tr><td>1</td><td>Heavy Books on the Shelf</td><td>Heavy items can be displaced and can fall</td><td>Move the heavier items to the lower shelf</td></tr>
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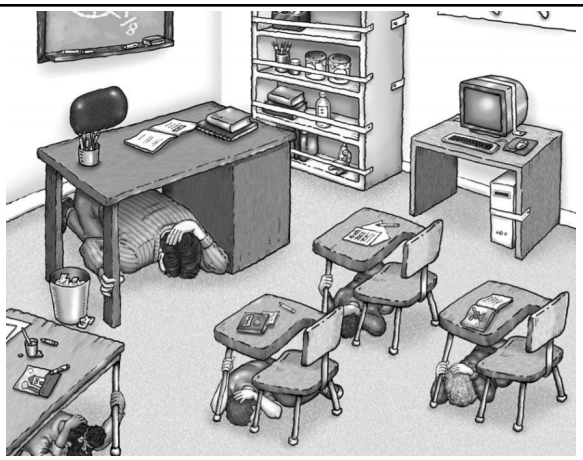
2	Hanging Glass Chandelier	Glass can be injurious	Secure the light and move bed or table from under this light
3	Lose Chest of Drawers	Not attached to the wall and can fall	Attaching the cabinet to the wall

15 minutes

The learners will make a plan for their family with suggested changes to ensure they are aware of the hazards
Learners will now create a plan for evacuation or staying safely at home during an Earthquake
Given that Earthquakes can last as long as 2 – 3 minutes and be followed by aftershocks or smaller Earthquakes, what would learners consider the correct safety protocol to be?
For those outside the home:
i) Where do you think is the correct outdoor location? How would you stay away from potential hazards such as buildings and power lines? (Answer: Please move to open land and spaces with no danger)
ii) Given a potential aftershock or damage at home, when do you think is the right time to return to your home? (Answer: Please do stay outdoors and only re-enter home only after secured by authorities)
For those who are inside the home,

vii) Would it be possible to evacuate the building during a quake of that length? (Answer: No, because there is not enough time)
viii) What would be some of the hazards along the way if we tried to leave the building during a quake? (Answer: objects falling, windows breaking)
ix) When should learners evacuate given the potential for an aftershock? (Answer: they should seek cover until at least a full minute has passed without shaking)
x) Where in your home should you be located to be safe from household items falling or injuring you? (Answer: Away from windows and other lose or precarious items)
xi) What is the best position to stay safe from injury? How will you protect your eyes, face and critical organ of heart and lungs? (Answer: Crouch bending their heads to their knees and put both hands on the back of your neck)
xii) What in your home can be used as a shield to prevent injuries from shattered glass and debris? (Answer: Under a table and desk or using coats or thick blankets as a shield from glass or debris)

		 **Critique and revision:** Learners present their understanding of earthquakes and their emergency preparedness plan with their families developed to their parents or family members for feedback and suggestions for improvement. The parents or family members provide feedback using the following format: ● Praise: What did you like about the learner's work done? ● Question: Any questions or clarifications you have about the work? ● Suggestions: In what areas does the learner need to improve their work? **Reflection:** Thinking about the activities from the entire week, can you tell us: - Three things you have learned from all the week's activities - Two things you found interesting - One thing that you still have a question about
Assessment Criteria:		- Understanding of tectonic plates and their movement and how that creates earthquakes. - Representation of how geographical features are formed. - Designing maps and jigsaw puzzles - Drawing up the emergency preparedness plans

Topics/concepts covered	- Earth formation - Tectonic plates and layers of the earth - Earthquakes - Formation of geographical features - Drawing maps and making jigsaw puzzles - Emergency preparedness plan Critical thinking, creativity and communication skills
Learning outcomes:	- Learners will understand how the earth was formed and explore tectonic plates and the various layers of the Earth - Learners will understand how the movement of the tectonic plates leads to the formation of geographical features

	- Learners will explore ways in which they can develop earthquake resistant structures - Learners will be able identify any risks or dangerous areas and items within their homes and come up with earthquake preparedness protocols for their homes
Required previous learning:	- Basic knowledge on the world map
Inspiration:	None
Additional enrichment activities:	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 represents the lava that comes out of volcanoes when they erupt EARTHQUAKE MEASUREMENT Learners will reflect on the fact that the land they stand on is moving and how slowly it moves that they cannot feel it. Learners will measure the impact of earthquakes by designing their own Seismograph instruments. Seismographs are instruments used to record the motion of the ground during an earthquake. Step 1: Place the tables or desks side by side. Stack the books on top of the piece of cardboard on one desk. Step 2: Insert the ruler or any long thin stick between two books near the top of the stack. The ruler should stick out over the adjacent desk. Step 3: Hang the pencil or marker from the end of the ruler using three rubber bands and the coin if needed for extra weight. The marker or pencil should touch a piece of paper placed under it on the adjacent desk when the cardboard is moved. The first desk represents the place where the earthquake is occurring. A family member can make the earthquake occur by shaking the cardboard back and forth towards the second desk. The pen will move as this earthquake occurs. The second desk represents the recording station.

	Learners can record the earthquake by slowly pulling the paper underneath the marker while the cardboard is being shaken. This record that the seismograph creates is called a seismogram. Learners should simulate 3 to 5 earthquakes and then make a hypothesis on reading the seismogram. Hint: The tallest wave represents the Earthquake with the maximum intensity (or magnitude)