

Inquiring *Minds* key

This book requires a lot of critical thinking and problem solving. It is made this way so that students can work through it on their own, finding the answers to the questions independently. So let them find the solutions to the problems themselves. Intervene only when absolutely necessary.

Earth our home

What is earth made of?

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1 Scan to watch

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2 Examples: fruit, foam, ball, clay, playdough, etc.

You may also look for “layers of the Earth craft” online.

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Scan to watch

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4 The orange with peel represents **the Earth**.

The peel represents the Earth’s **crust**.

The pieces of peel represent **the plates**.

The jam represents the **partially melted layer** of the upper mantle.

Why does the Earth shake?

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2 *Accept all logical answers.*

Examples:

- Inside: stay calm, stay away from furniture, protect your head with your arms, do not run outside, do not use elevators etc.
- Outside: stay away from buildings and power poles etc.

What is a tsunami?

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2 Scan to watch

Tsunamis are dangerous and unpredictable massive waves. They can be caused by **earthquakes**, volcanic **eruptions**, landslides, or meteorites. In the deep ocean, a tsunami is barely noticeable but when the waves reach the **shore** their height can be as tall as 100 feet. A tsunami wave moves **forward** and crashes over the coastline obliterating almost everything in its path. Then it **recedes** and drags everything back to the ocean. The best defense against a tsunami is early warning that will give residents time to seek higher **ground** before it hits.

3

Landslide	a mass of rock and earth quickly moving down a slope
Obliterate	wipe out
Recede	move back
Crash	hit with destructive force
Noticeable	easy to see
Resident	a person who lives in a place

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5 Watch the [video](#) to get some ideas about what the students could build to make a tsunami shield.

Why do volcanoes erupt?

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2 Scan to watch

There are about 1.5000 **active** volcanoes, on land and on the **ocean** floor. There are many types of different volcanoes, classified by **shape** and size. All volcanoes emit **gas** and molten **rocks**. The core of the Earth burns as hot as the **surface** of the Sun. This heat **melts** rocks in the Earth's Mantle. This is called **magma**. After it gets out of the volcano it is called **lava**. The most **destructive** eruption ever documented occurred in Indonesia in 1815. Even though volcanoes are

so destructive they help make life on Earth **possible**. Their ash helps plants grow and when lava **cools** down it creates new landforms.

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4 Attach the plastic bottle to the center of a paper plate. Use clay to form a mountain around the bottle. Your mountain should completely cover the bottle. The hole in the bottle will be the crater where the lava comes out, so be careful to not get any clay in it. You may want to let the clay dry, but it's not necessary. Once your mountain is ready, prepare for your eruption. First, pour some water into your volcano crater. Add 3 to 4 drops of dish washing soap and 3 to 4 drops of food coloring. Stir in the baking soda. Pour some vinegar into another cup so it is about 1/3 full. Quickly pour the vinegar into your volcano crater, step back, and watch your volcano's eruption!

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5

Earthquake	the energy released when two plate tectonics crush
Tectonics	big pieces that constantly move on the Earth's crust
Lava	the hot liquid that comes out of a

	volcano
Magma	the molten rocks inside a volcano
Volcano	a breaking point on the Earth's crust that allows magma to escape
Crust	a thin shell on the outside of Earth

Water is Life

Why does it rain?

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2 Scan to watch

Evaporation	When the Sun heats the ocean and turns the liquid water into gas which goes up in the air.
Precipitation	When the clouds become so heavy that they can no longer hold the water droplets inside them and it starts to rain.
Condensation	When the gas, also called water vapor cools down and forms clouds.

Why is clean water important?

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2 Scan to watch

Setting	Africa, desert, village
Characters	Gie-Gie, her mum, her dad
Problem	there is no clean water in the village, no access to water, they have to walk a long distance every day to get water etc

Can we undo pollution?

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Scan to watch

All Things Green

Why do we need trees?

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Scan to watch

Can plants move?

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1 Scan to watch video 1 & video 2

Students' own answers.

2 Working in pairs, students pour the seeds into the balloon. One problem they may encounter is: Once the balloons are placed on the end of the funnel, some of the balloons won't open all the way and the seeds can't drop into them. To solve this problem, students can blow up the empty balloons then gently release the air to stretch them out first. They can also stretch the necks of the balloons to create a larger opening that will allow the seeds to flow in more easily.

How can we make our own vegetable garden?

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2 Scan to watch

The True Survivors

How can we survive being stranded on an island?

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2 Scan to watch

Surfing Sounds

What is sound?

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2 Students' own answers.

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4 Scan to watch

5 All sounds are made through **vibrations**. When something vibrates it moves back and forth so fast that our eyes can't see it moving. However, our ears can sense these vibrations. The air around us is made of tiny **particles** which carry sound. When a sound is produced, it causes these tiny particles to bump into their neighboring particles, which then bump into their neighbors, and so on. This path of vibration is called a **wave**. But how do we hear those vibrations? Inside our ears there is a little part that looks like the top of a **drum**. This part of our ear vibrates when sound waves travel into our ear. There is a spot even deeper inside our ear that senses these vibrations and sends a message to our **brain** telling it that a sound has been heard.

How can we make sound?

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1 *Experiment*

Put different amounts of water in each glass. For example, have one glass almost full, one glass half full, one glass almost empty, etc. Use the

spoon to tap on the glasses, one at a time. The glasses with different amounts of water make different sounds. We hear sounds because the air around us vibrates, carrying the sound to our ears. Hitting the glass causes it to vibrate and make a sound that we can hear. When a glass has little or no water in it, it has lots of air in it. Hitting this glass makes a higher pitch sound than the glass with lots of water. This is because the empty glass only has air around it, so the glass vibrates quickly when it is hit, causing the high pitch sound. The glass full of water causes the glass to vibrate slower, and the sound you hear is at a lower pitch.

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3 Scan to watch

Space Exploration

Why do we see stars at night?

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3 Scan to watch

Why do we explore space?

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2 Scan to watch

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3 Order of planets:

Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune

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8 Scan to watch

What is gravity?

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1 Scan to watch

Now **check out** your weight on other planets.

2 Scan to watch

Why do we only see one side of the moon?

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2 Scan to watch

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5 Scan to watch