WHAT IN THE WORLD?

Levels 1 & 2 (grades 5 and up)

Kilauea: Slow-Motion Disaster

BREAKING NEWS
JUNE 2018

LesPlan

A monthly current events resource for Canadian classrooms

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TO THE TEACHER

What in the World?
BREAKING NEWS
June 2018

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Please let us know if you or a colleague would like to receive a complimentary sample of any of our publications.

We welcome your comments and suggestions.

MISSION STATEMENT

LesPlan Educational Services Ltd. aims to help teachers develop students' understanding of and ability to critically assess current issues and events by providing quality up-to-date, affordable, ready-to-use resources.

SUGGESTED APPROACH

WHAT IN THE WORLD? is a complete current events program that can be used on its own or to supplement an existing classroom routine. This classroom-ready resource offers 'something for everyone' and can be taught as a whole or in parts, in-class, or as a homework assignment.

WHAT IN THE WORLD?:

• ALLOWS FOR DIFFERENTIATED LEARNING

WHAT IN THE WORLD? is available in two levels to meet your students' varied learning needs.

A Word file containing each month's articles and questions is also posted online, so you can quickly and easily modify the articles and/or questions to suit your students' specific needs.

• IS TECH-FRIENDLY

Project each month's pdf on your Promethean or Smart Board to read articles together. Our pdfs also work seamlessly with assistive reading technology like Kurzweil. Try uploading them to Google Classroom!

• IS EASY TO USE

Easily access links referenced in **WHAT IN THE WORLD?** by visiting **www.lesplan.com/en/links**

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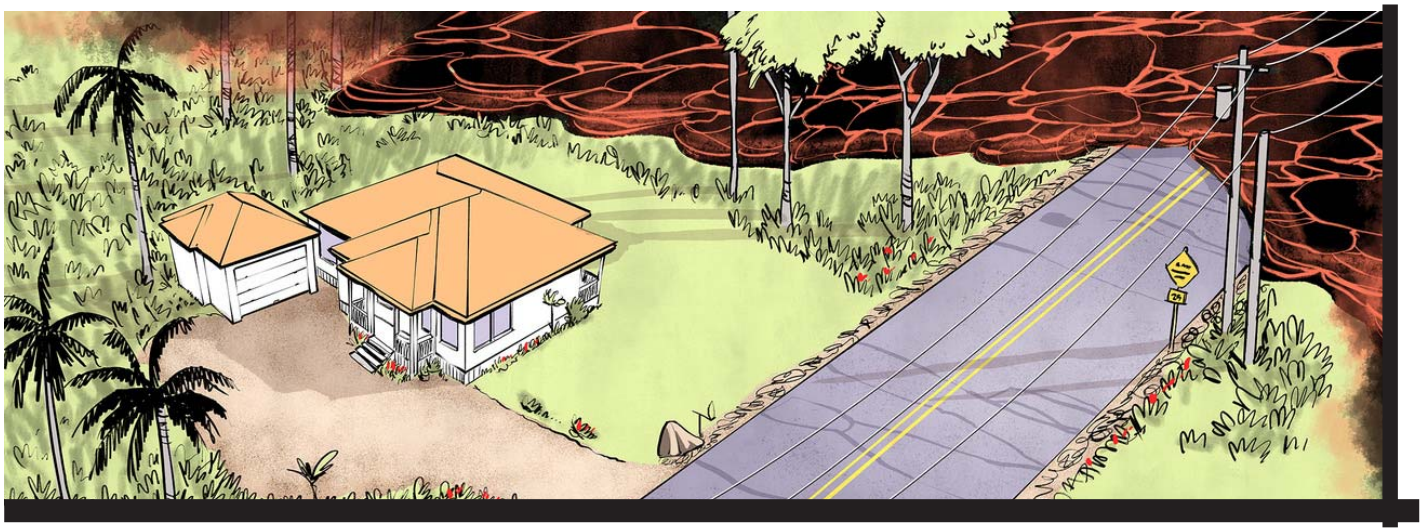
KILAUEA: SLOW-MOTION DISASTER



Hawaii's youngest and most active **volcano** is gushing **lava**. During May, it shot out molten rock, oozed lava from cracks in the ground, and created ash clouds that rose thousands of metres into the air.

The eruption has destroyed dozens of structures on the Big Island of Hawaii and forced some 2000 people to evacuate. However, it has also given scientists a rare chance to study how volcanoes work.

Kilauea (pronounced Kill-oh-way-a) is currently the world's most active volcano. It has erupted 62 times since 1823. The most recent eruption began 35 years ago, when a second vent opened on the volcano's east slope, 20 kilometres from the summit. Lava has bubbled in the two craters ever since.

Warning signs

Scientists monitor Kilauea closely. They look at thermal imaging and scan satellite photos. They also check **seismographs**, GPS stations, tilt meters, and other scientific equipment. The reason?

"Volcanoes give us warning when they're about to do something," says geologist Tari Mattox.

Under pressure

Kilauea began to change on April 30. First, the lava lake on the east slope drained. Two days later, the lava lake in the summit crater disappeared as well.

That created pressure in the volcano's underground passages. As the magma shifted, hundreds of earthquakes shook the area. Most were small, but one tremor measured magnitude 6.9 on the Richter Scale, the biggest since 1975.

Breaking new ground

On May 3, the rising pressure forced the **magma** through a new

About volcanoes

There are three main types of volcanoes: shield, cinder cone, and composite.

Kilauea is a shield volcano. These produce hot, runny **magma**, which allows explosive gases to bubble out instead of building up. As a result, shield volcanoes usually overflow rather than blow their tops. Magma can flow from the top like a pot boiling over or pour out of cracks on the slopes. The steady buildup of **lava** gives shield volcanoes their low, broad profile.

Cinder cone volcanoes and composite volcanoes are cone-shaped. They usually erupt explosively. Over time, small, fast-growing cinder cones may develop into tall, steep composite volcanoes. Well-known composite volcanoes include Mount St. Helens in Washington State and Mount Fuji in Japan.

DEFINITIONS

LAVA: magma that has reached the surface
MAGMA: molten rock inside the Earth
SEISMOGRAPH: a device that measures and records vibrations of the Earth
VOLCANO: an opening in the Earth's crust through which molten rock, ash, and gases are forced out

KILAUEA: SLOW-MOTION DISASTER

conduit. It emerged in residential neighbourhoods 40 kilometres below the summit.

Two dozen more large **fissures** opened over the next few weeks. Lava oozed, spurted, and fountained from the cracks. Then on May 22, Kilauea reached a new, more violent phase. The volcano's craters began spitting out ash and boulders. The lava fountains got higher and overflowed. Rivers of lava then flowed slowly downhill and into the ocean, devastating everything in their paths.

A NEW PHASE

"We call that the 'throat clearing' phase," says geologist Carolyn Pearcheta.

It was a sign that the volcano had pushed out all the old magma "sitting in its pipes." The fresh magma was hotter and moved faster.

According to the U.S. Geological Survey, the lava temperature below ground is about 1250 degrees Celsius. The eruption temperature of the lava is slightly cooler – about 1170 degrees Celsius.

THE FUTURE IS UNKNOWN

As the volcano becomes even more destructive and dangerous, scientists are watching it closely. They don't know for how long the eruption will continue, and they aren't sure what will happen next. However, they do know it will be exciting. ★

BREATHLESS

Lava isn't Kilauea's only by-product. The volcano has also been producing toxic clouds of volcanic gas called "vog" and "laze."

Vog is volcanic fog created by sulphur dioxide that leaks from Kilauea's vents and fissures. Laze (lava + haze) results when rivers of lava reach the ocean. A chemical reaction between the lava and seawater produces **corrosive** clouds of hydrochloric acid and steam that are laced with shards of volcanic glass.

Both of these gases are hazardous to human health. They can irritate the skin, eyes, nose, and lungs. They are especially dangerous for people with respiratory problems, like asthma, bronchitis, and emphysema. Officials distributed masks and warned people to protect themselves.

FROM VOLCANOES TO ISLANDS

The U.S. state of Hawaii is a group of 130 volcanic islands, located in the middle of the Pacific Ocean. This tropical **archipelago** has eight main islands. Hawaii, the largest and most southerly island, is made up of five overlapping volcanoes. It is often called "the Big Island" to avoid confusion with the name of the state.

The Hawaiian islands grew from a chain of underwater volcanoes. Scientists believe they formed after magma from a volcanic **hot spot** broke through the **Pacific Plate**. With every eruption of magma, the volcano over the hot spot grew larger until it finally reached sea level and became an island.

Over millions of years, the plate slowly drifted northwest. As one volcano shifted off the hot spot, another formed, then another, creating a chain of volcanic islands, like beads on a string. This theory explains why the youngest and most active volcanoes are located on the Big Island.

The Hawaii hot spot, which has been active for 70 million years, continues to build islands today. An underwater volcano southeast of Hawaii will eventually become a new Hawaiian island.

DEFINITIONS

ARCHIPELAGO: a group of islands
CONDUIT: a channel for water or other fluid to pass through
CORROSIVE: able to destroy or eat away by chemical action
FISSURE: a deep crack in the ground
HOT SPOT: an area beneath the crust from which hot magma rises from deep inside the Earth
PACIFIC PLATE: one of seven massive pieces of the Earth's crust

KILAUEA: SLOW-MOTION DISASTER

ON THE LINES

Answer the following in complete sentences:

1. Explain what a **volcano** is.

_____

2. What technology and equipment do scientists use to study volcanoes?

_____

_____

3. Describe how the Hawaiian islands were formed.

_____

_____

_____

4. List the three main types of volcanoes.

_____

5. What type of volcano is Kilauea?

_____

6. Describe the characteristics of this type of volcano.

_____

_____

7. When did Kilauea first erupt?

_____

8. Why did pressure in the volcano's underground passages increase in early May?

_____

9. Describe what happened because of this increased pressure.

_____

_____

_____

10. How has the most recent eruption impacted local residents?

_____

KILAUEA: SLOW-MOTION DISASTER

BETWEEN THE LINES

As a Hawaiian resident living on the slopes of Kilauea who has been evacuated, write an email to your parents living in Vancouver, B.C. describing what you are seeing, feeling, and experiencing as a result of the eruption.

A good email *includes key facts and supporting details, is believable, and shows imagination.*

BEYOND THE LINES

1. Find out more about three volcanoes in Canada: Mount Garibaldi, Mount Meager, and Hoodoo Mountain at **http://volcano.si.edu/** (search for each volcano under the 'Database' tab). For each one, record where it is located, how high it is, and the last time it erupted.

2. Find out which country has the most volcanoes at **http://wiki.answers.com/Q/What_country_has_the_most_number_of_volcanoes** How many volcanoes does this country have?

JUST TALK ABOUT IT

1. As you see it, what is the significance of this article? Explain.

2. What reasons can you suggest to explain why over the years, people have built homes and roads at the foot of – and on the slopes of – Kilauea, knowing that one day the volcano would erupt again?

3. Many people have had their lives disrupted as a result of the eruption. As you see it, who should be responsible for helping people who have been affected by Kilauea's eruption, in the short term and in the long term? Explain.

ONLINE

1. Watch lava pouring from Hawaii's Kilauea volcano at
https://youtu.be/VvS20fqTu34

2. Read "Kilauea volcano's lava pours into ocean, prompting more warnings" on the CBC website at
http://www.cbc.ca/news/world/kilauea-volcano-hawaii-lava-ocean-toxic-gas-1.4672625

3. Learn why Hawaii's volcano is so unusual at
https://youtu.be/kotnqPmwWvk [8:32]

4. Learn more about Hawaiian volcanoes, especially Kilauea, at
https://youtu.be/3OcfhEy2VTw [16:59]

5. View an infographic explaining how Kilauea's volcano works at
https://www.livescience.com/28192-how-hawaii-s-kilauea-volcano-works-infographic.html

6. Take a look at a satellite view of the Kilauea eruption at
https://www.jpl.nasa.gov/spaceimages/details.php?id=PIA22450

7. Watch a CNN report showing time-lapse photography of the volcano lava flow at
https://youtu.be/z-ZeCIGKmc4 [1:26]

8. View a National Geographic video about volcanoes and their environments at
https://youtu.be/zFIWWMoIv-U [3:30] ★

Images in the News

Kilauea: Slow-Motion Disaster

Directions:

1. Study the photograph below.
2. Then, complete each quadrant on the **Getting Inside the Picture** chart. Use as many details as you can.
3. Now, select one of your powerful words. Use this as a springboard for a 5-minute **Quick Write**. Let your pen flow. *A good descriptive paragraph has vivid details and helps the reader "get inside the picture" (experience the event as if he/she were right there).*
4. Generate three possible titles for this picture. Then select the one that best captures the essence of the image. Explain why this is the most suitable title.

Helicopter overflight of Kīlauea Volcano's lower East Rift zone on May 19, 2018, around 8:18 AM, HST. Lava flows emerging from the elongated fissure 16-20 form channels. The flow direction in this picture is from upper center to the lower left. (USGS)

Images in the News

KILAUEA: SLOW-MOTION DISASTER

Title: _____

Senses What might you hear, smell, taste or touch? What colours, textures, sounds, movements might you experience?	**Images** What details in the photograph create vivid pictures in your mind?
Words What powerful words describe the scene? What might you think, wonder, say if you were there?	**Feelings** What do you feel when you look at this image? What might the people in the region where the photograph was taken be feeling?

Quick write

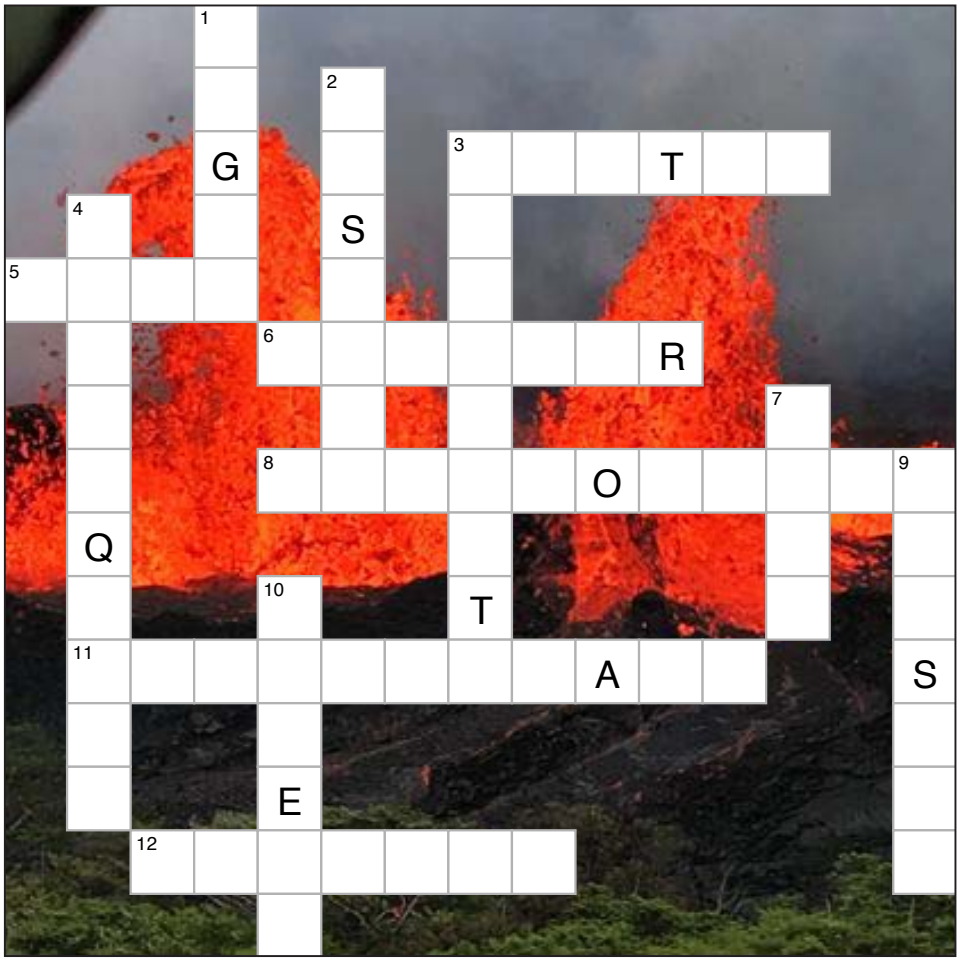
Possible titles:

1. _____ 2. _____ 3. _____

The best title is # _____ because . . .

PUZZLE

KILAUEA: SLOW-MOTION DISASTER



(https://commons.wikimedia.org/wiki/Category:Pu‘u_‘Ō‘ō_in_2018#/media/File:USGS_Kīlauea_multimediaFile-2083.jpg)

ACROSS

3. a round hole at the top of a volcano

5. magma that has reached the surface

6. Kilauea's vents leak _____ dioxide gas

8. device that measures and records vibrations of the Earth

11. a group of islands

12. Hawaiian islands' volcanic activity has been ongoing for 70 _____ years

DOWN

1. molten rock inside the Earth

2. a deep crack in the ground

3. _____ volcanoes are cone-shaped

4. a sudden shaking movement of the ground

7. chemical reaction between lava and seawater

9. Hawaiian islands formed after magma from a _____ broke through the Pacific Plate (2)

10. Kilauea is a _____ volcano

MAP ASSIGNMENT

Complete this map assignment to better understand the article ***Kilauea: Slow-Motion Disaster***.

INSTRUCTIONS

1. Obtain the required resources and read all the instructions before starting.

2. Colour your map **after** all labelling is completed.

3. Print in pencil only first, then go over the printing in black ink.

4. Work carefully and neatly.

Resources Required: pencil, black pen, pencil crayons, ruler, eraser and an atlas.

Part A Locate and label the following islands and shade each as indicated:

Hawaii [The Big Island] (red)	Maui (purple)
Kahoolawe (yellow)	Lanai (pink)
Molokai (brown)	Oahu (orange)
Kauai (green)	Niihau (yellow)

Part B Locate and label the capital of the State of Hawaii and underline.

Part C Locate and label the following cities:

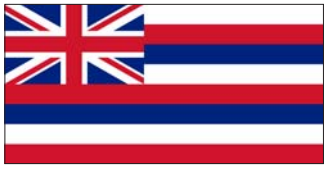
Pearl City	Hilo
Kailua	Kaneohe
Wailuku	Kapaa

Part D Locate and label the following and shade all ocean water dark blue:

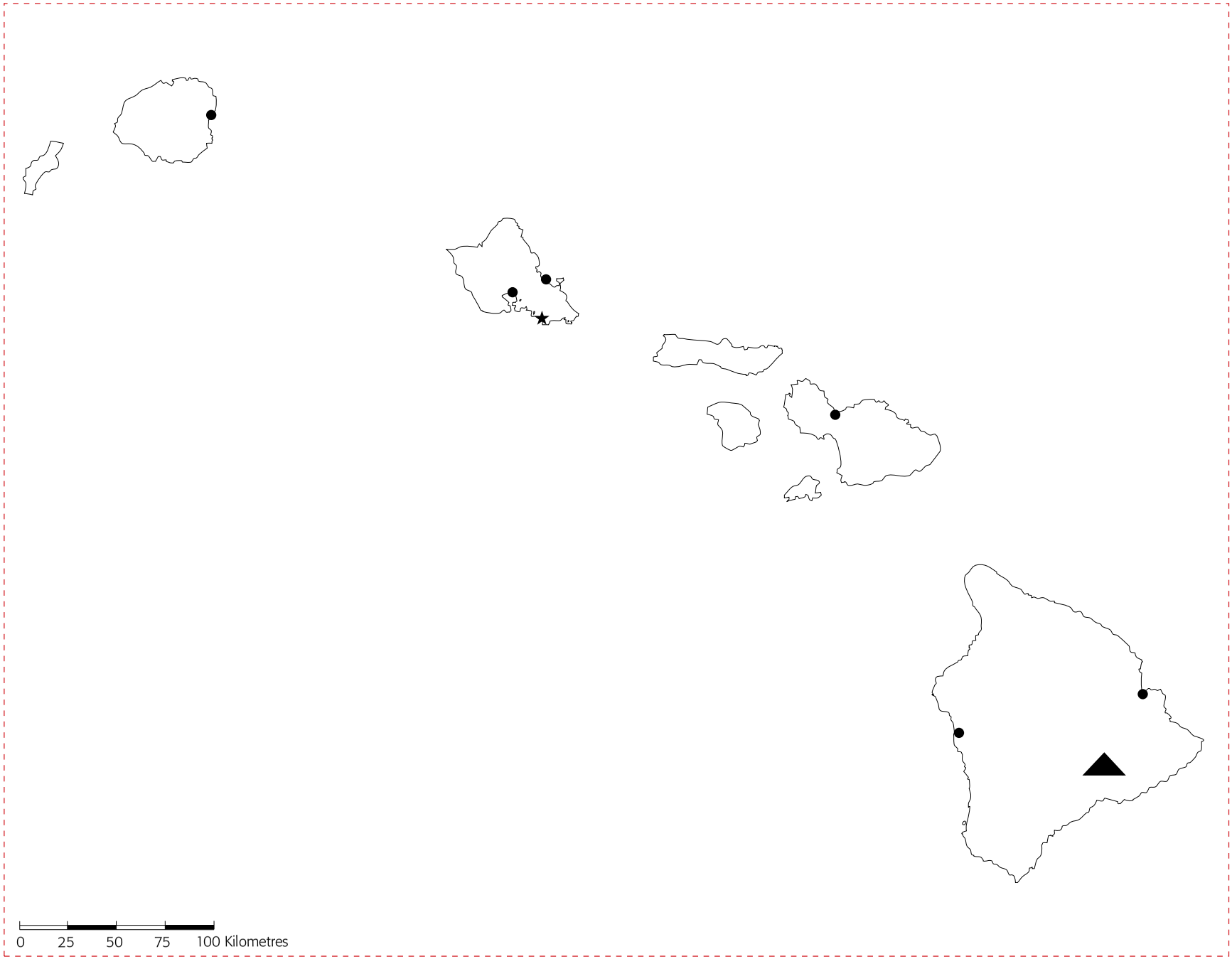
Pacific Ocean	Kaulakahi Channel
Kaiwi Channel	Kauai Channel (Kaieie Waho Channel)
Pailolo Channel	Alenuihaha Channel

Part E Locate and label the Kilauea volcano.

Part F Complete your map with a frame, title, and compass. ★



Hawaii


0 25 50 75 100 Kilometres

QUIZ

KILAUEA: SLOW-MOTION DISASTER

Write the letter that corresponds to the best answer on the line beside each question:

_____ 1. **Which Hawaiian island has the youngest and most active volcanoes?**
a) Hawaii
b) Honshu
c) Maui
d) Oahu

_____ 2. **For how long has Kilauea been active?**
a) since April 30
b) about 35 years
c) about 100 years
d) nearly 200 years

_____ 3. **Which of the following was NOT caused by the Kilauea volcano?**
a) some 2000 residents were evacuated
b) a huge explosion blew the top off the volcano
c) hundreds of earthquakes shook the region
d) two lava lakes drained creating pressure underground

_____ 4. **True or False?** Kilauea is the oldest volcano on the Hawaiian islands.

If False, write the correct answer below:

_____

_____ 5. **True or False?** Kilauea is a cinder cone volcano.

If False, write the correct answer below:

_____

6. ***People should not be allowed to live near active volcanoes.*** Do you agree or disagree with this statement? Give reasons to support your response.

_____

_____

_____

_____

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_____

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