Rift Zone Activity

Objective: Investigate the patterns in rock formations to explain landscape change over time due to volcanic activity. Understand the connection between rift zones and lava flows.

Curriculum Standards:

NGSS

4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.

HĀ

Strengthened Sense of Belonging, Strengthened Sense of Hawai'i

Materials Needed: Pencils, Coloring pencils/Crayons **Time Estimate: 25 minutes**

Procedure:

1. GUIDED ACTIVITY: Distribute Rift Zone worksheet, 1 per student. Read oral clues for students. If needed, explain the cardinal points, as they will be the main identifier for clues.

Students will label each of the five volcanoes on the Island of Hawai'i using a word bank and oral clues about each volcano. If understanding the cardinal points is too difficult, class can alternatively compare the two maps and write in volcano names.

2. GUIDED ACTIVITY: Project (or print multiple copies for groups to look at) the map of past lava flows since 1800 (page 4). Instruct students to compare the two maps and then color on their own map (page 2), showing where lava has flowed since 1800.

Students will use crayons/colored pencils to color where previous lava flows have moved on the island.

3. ORAL LESSON: Guide students in understanding how rift zones work as underground plumbing systems for volcanoes and therefore, why the lava activity has followed the rift zones.

Directory:

Page 1 – Teacher Instruction Guide

Page 2 – Student Worksheet

Page 3 – Teacher Guide for Worksheet

Page 4 – Map of Historic Lava Flows

Page 5 – Oral Clues and Rift Zone Lesson

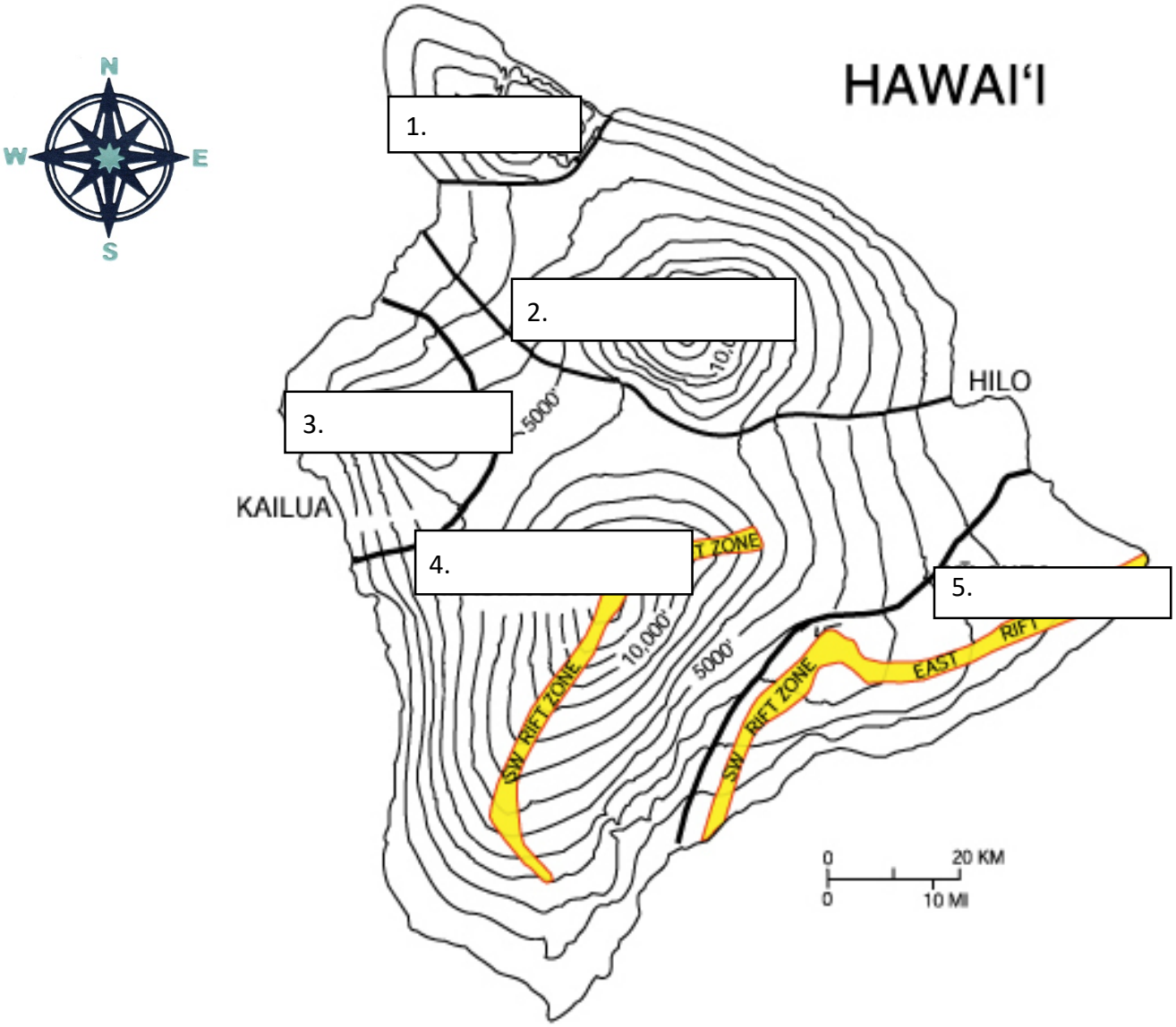
Additional Resources:

- https://hilo.hawaii.edu/natural-hazards/volcanoes/riftzones.php
- http://www.punaridge.org/doc/teacher/riftzones/Links.htm

Name _____ Date _____

Island of Hawai‘i Rift Zones and Volcanoes
How are they connected?

Part 1. Label the five volcanoes of the Island of Hawai‘i. Listen to the clues and use the word bank below.



Word Bank

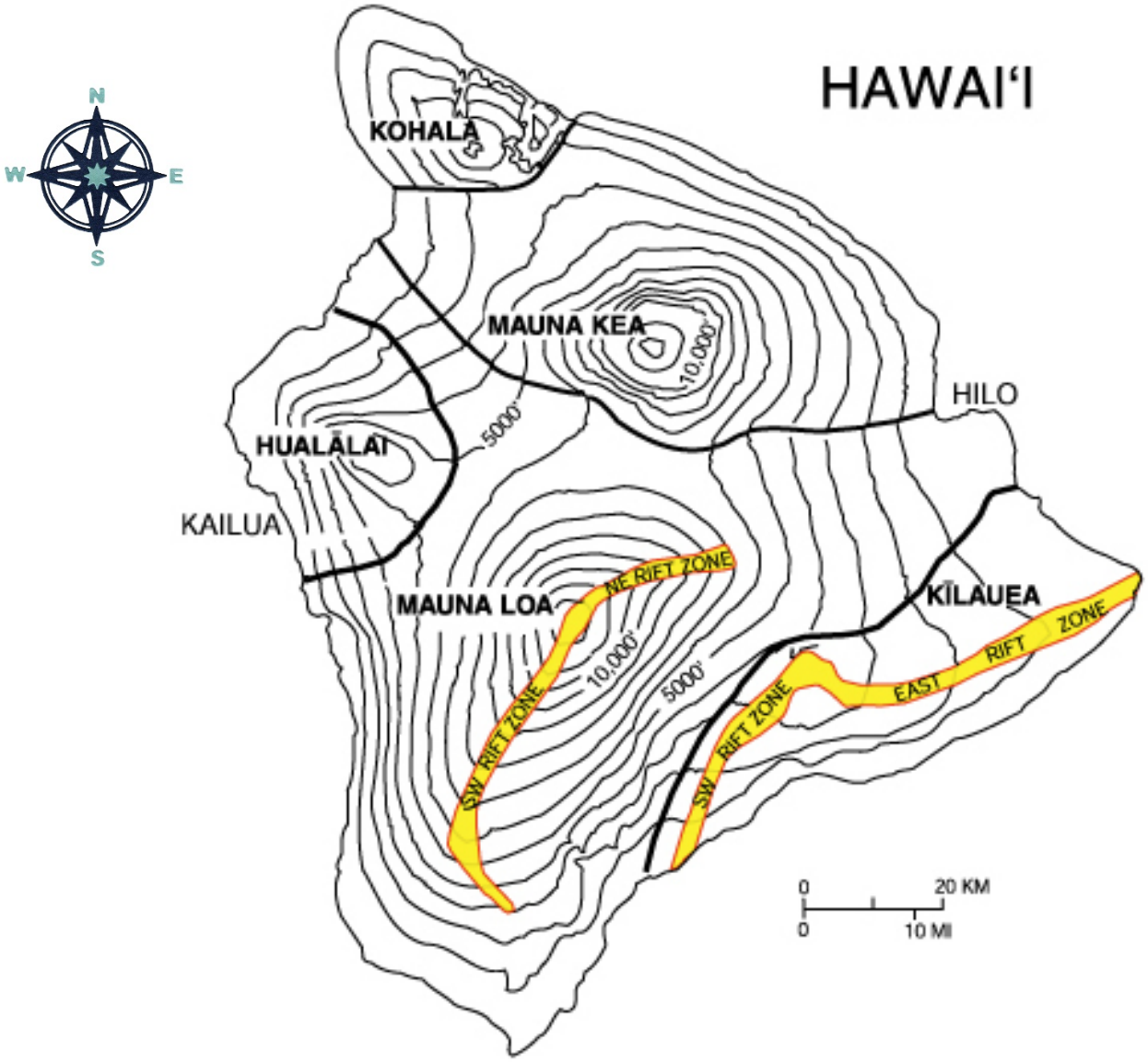
KOHALA		MAUNA KEA
MAUNA LOA	KĪLAUEA	HUALĀLAI

Part 2. Use the historic lava flow map as a reference and color the lava flows (in red) over your map. Is there a particular route the lava seems to follow?

Name _____ Date _____

Rift Zone and Lava Flows Worksheet – Teacher Guide

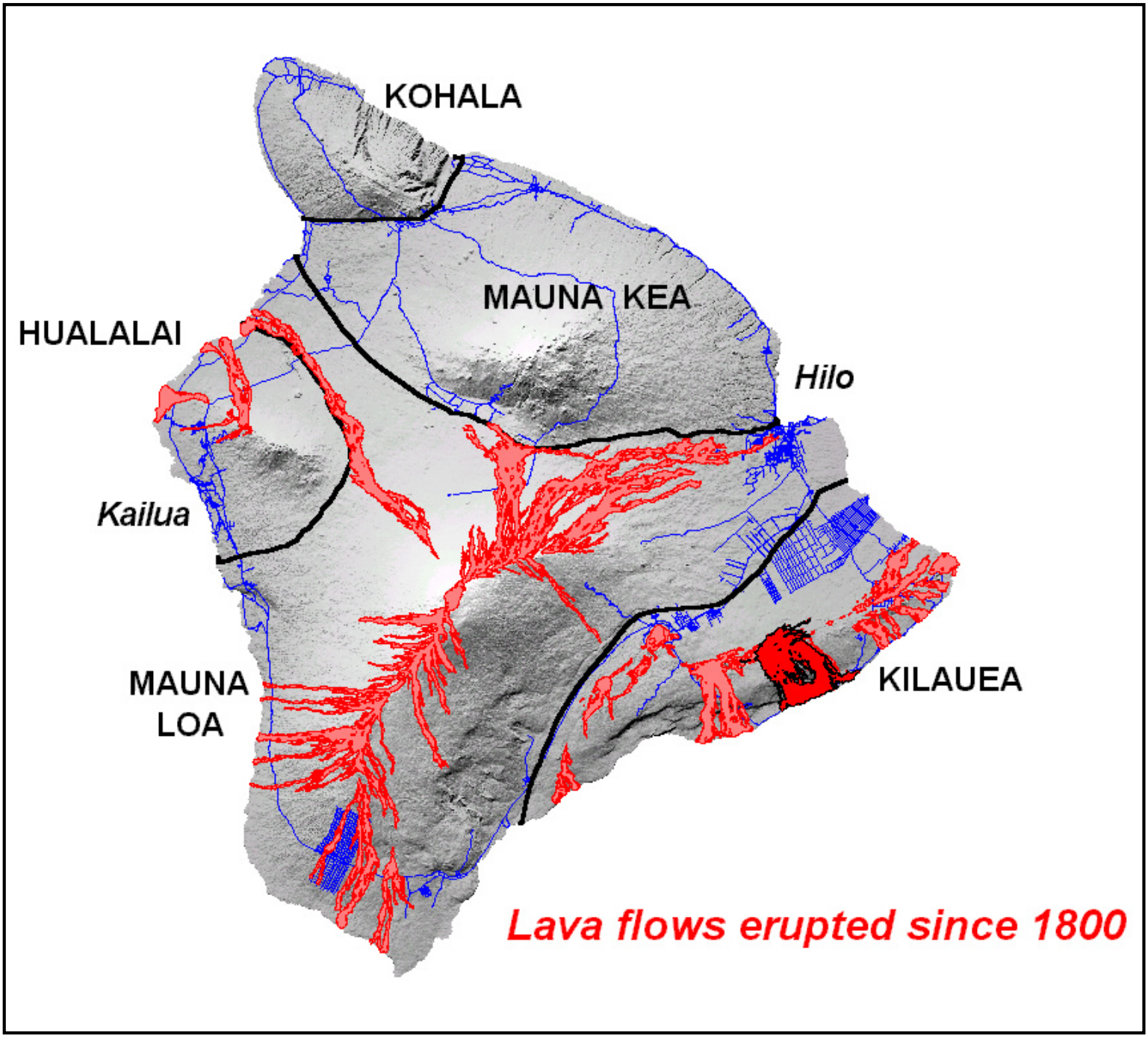
Part 1. Label the five volcanoes of the Island of Hawai‘i. Use the word bank below.



Part 2. Use the historic lava flow map as a reference and color the lava flows (in red) over your map. Is there a particular route the lava seems to follow?

Answer: Lava mostly erupts from the summit or rift zones of volcanoes. Rift zones are weak seams or cracks in the structure of volcanoes, making it easy for lava to erupt there.

University of Hawai‘i at Hilo: Natural Hazards of Hawai‘i Island



Map of lava flows occurring within the last 200 years, lava flows shown in red.

https://hilo.hawaii.edu/natural-hazards/volcanoes/riftzones.php

Oral Clues

- **Kīlauea** is the youngest volcano out of the five and is one of the most active volcanoes in the world. Kīlauea has an East Rift Zone and is the most south-eastern volcano on the Island of Hawai'i.
- **Hualālai** is the third-youngest and the third-most active of the five volcanoes that form the Island of Hawai'i. Hualālai is closest to the town of Kailua and the western most volcano on the island.
- **Kohala** is the oldest volcano on the Island of Hawai'i and considered an extinct volcano, meaning that it no longer erupts. Kohala is the northern most volcano on the island.
- **Mauna Kea** is the tallest volcano in Hawai'i, so high that snow falls on the summit. Mauna Kea is considered an active volcano, but has not erupted in thousands of years. Mauna Kea is located just south of Kohala.
- **Mauna Loa** is the second-youngest volcano and second-most active on the Island of Hawai'i. Mauna Loa is has a SW (South West) Rift Zone and a NE (North East) Rift Zone.

Rift Zone Lesson

When there is a lot of magma inside a volcano, it needs more exits than just the summit (the top) of the volcano. The pressure of the magma inside the volcano can make cracks on the sides of the volcano. These cracks are called rift zones, where lava may also come out during an eruption.

Once at the surface, lava flows downhill because of gravity, jusy like water. Looking at the maps you have colored, can you see that lava flows often start on the rift zones? Each volcano creates its own rift zones because of the pressure inside. We can use technology to map where these rift zones are and better understand where lava might flow in the future.

Vocabulary Terms: **magma, lava, rift zone, summit**