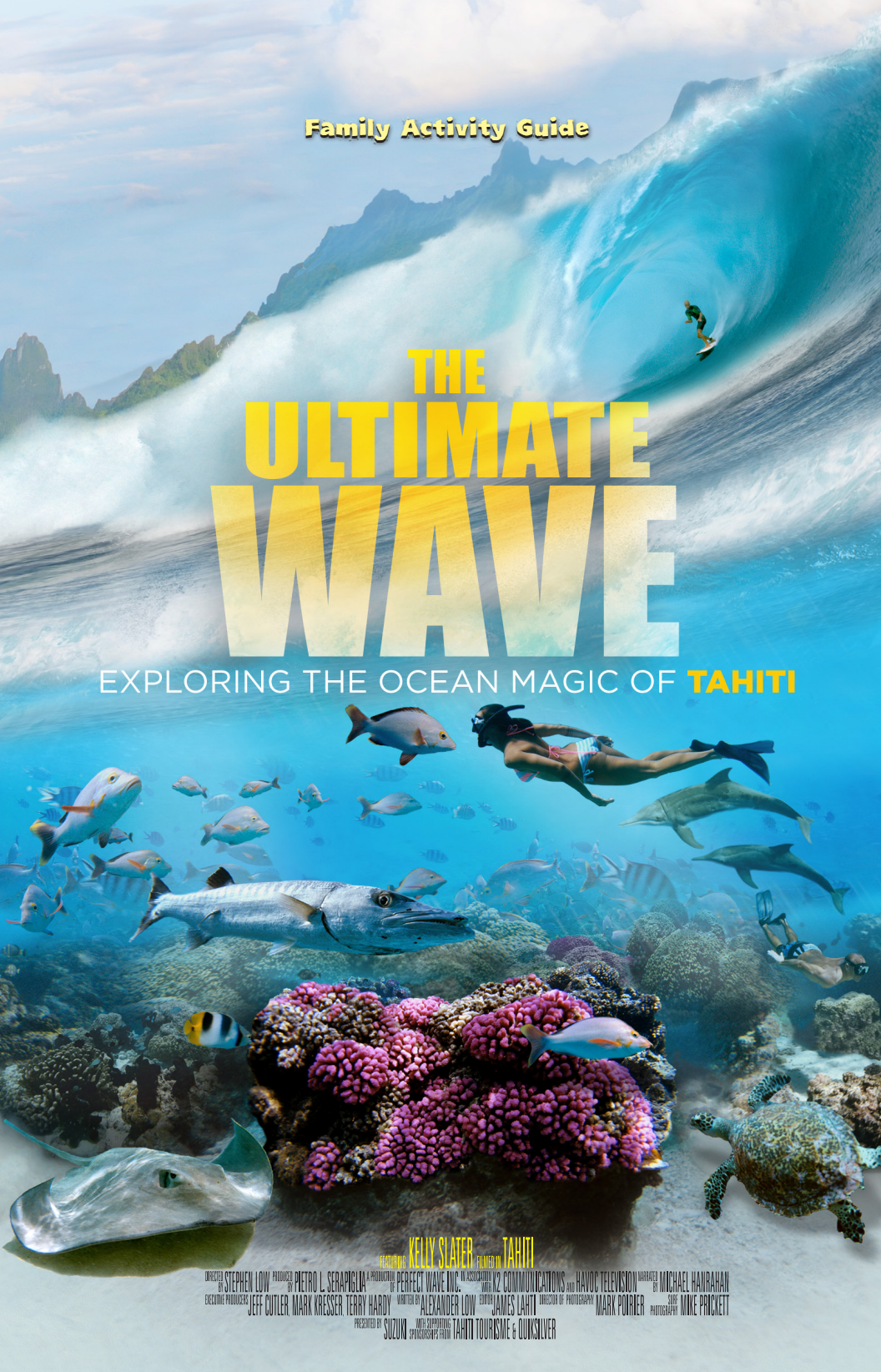
Family Activity Guide
THE
ULTIMATE
WAVE
EXPLORING THE OCEAN MAGIC OF TAHITI
FEATURING KELLY SLATER FILMED IN TAHITI
DIRECTED BY STEPHEN LOW PRODUCED BY PIETRO L. SERAPIGLIA A PRODUCTION OF PERFECT WAVE INC. IN ASSOCIATION WITH K2 COMMUNICATIONS AND HAVOC TELEVISION NARRATED BY MICHAEL HANRAHAN
EXECUTIVE PRODUCERS JEFF CUTLER, MARK KRESSER, TERRY HARDY WRITTEN BY ALEXANDER LOW EDITED BY JAMES LAHTI DIRECTOR OF PHOTOGRAPHY MARK PORTER SCUBA PHOTOGRAPHY MIKE PRICKETT
PRESENTED BY SUZUKI WITH SUPPORTING SPONSORSHIPS FROM TAHITI TOURISME & QUIKSILVER

About the Film

Featuring nine-time world surfing champion Kelly Slater, *The Ultimate Wave Tahiti* follows a quest to find the perfect wave-riding experience. The film's action focuses on Tahiti and the volcanic islands of French Polynesia, home to some of the world's most challenging surfing and to astounding coral reef ecosystems at the turbulent interface between island and ocean.

With their host, Tahitian surfer Raimana Van Bastolaer, Kelly Slater and a group of friends seek out the best waves breaking on the reef at Tahiti's famed surf site Teahupo'o. Kelly and Raimana share a passion for the waves, but have different ideas about what surfing means to them: is it a modern competitive sport or an ancient Polynesian wave-riding art? As the surf quest unfolds, the film explores the hidden forces at work shaping the waves and the islands that lie in their path. The great waves arrive, and surfing play becomes surfing survival as the riders tackle some of the biggest, heaviest surf on the planet.

The Ultimate Wave Tahiti is presented by Suzuki,
with supporting sponsorships from Tahiti Tourisme and Quiksilver.

This Activity Guide was produced by the ***The Ultimate Wave Tahiti*** Education Team:
Mel Goodwin, PhD, Marine Biologist and Science Writer
Sandy Goodwin, Coastal Images Graphic Design
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Photographs without credits are courtesy
The Ultimate Wave Tahiti Film Production team.

Watch and Discover

1. Why do waves get bigger as the sea surface becomes roughened?

2. Why didn't Raimana become a championship surfer?

3. What might happen to a surfer that would increase the danger from sharks?

4. How did early explorers know they were approaching Tahiti, even before the island appeared on the horizon?

5. Why are volcanoes necessary for coral reefs around Tahiti?

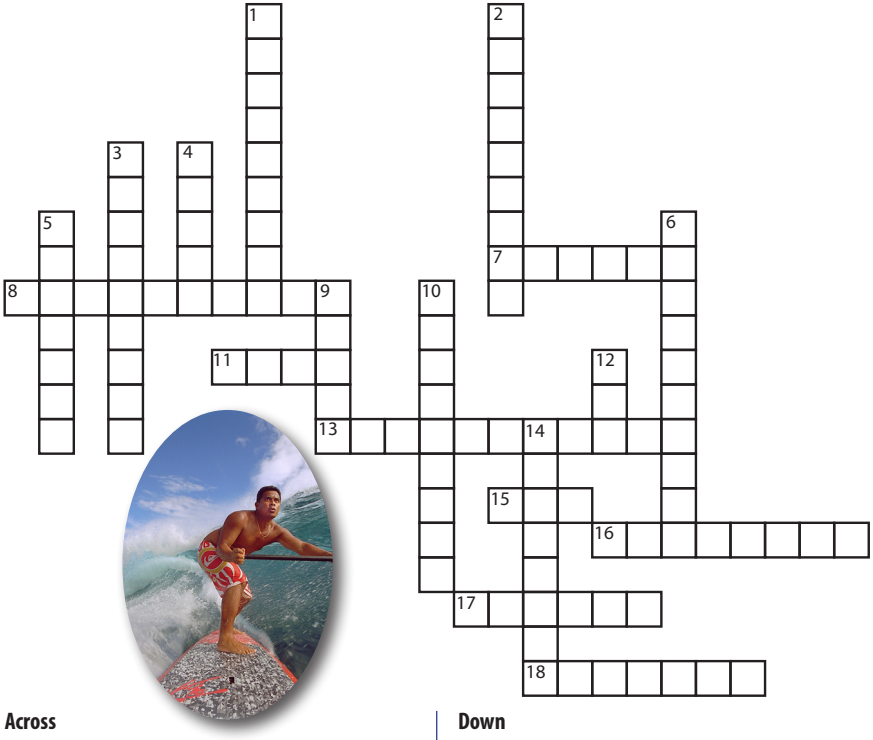
6. How did the ancestors of modern Tahitians first reach the island?

7. What has Kelly Slater noticed about coral reefs all over the world?

8. How many islands are in French Polynesia?

Answers are on the back cover.

Do You Remember?



Across

7. Waves contribute to the diversity of life on South Pacific coral reefs by increasing the concentration of _____ in the surrounding water.
8. form barriers that protect island beaches from the pounding of the sea (two words)
11. How many times has Kelly Slater won a world surfing championship?
13. Raimana says, "If you connect with the _____, you don't have to chase after the waves." (two words)
15. The greatest energy to Earth's atmosphere and ocean comes from the _____
16. What is the name of the village that Kelly & Raimana visited to find the ultimate wave?
17. When ocean waters absorb CO_2, they become more _____
18. Force that shapes the oscillating motion of the planets

Down

1. Raimana's motto (two words)
2. The _____ has the greatest influence on shaping arriving swells at Teahupoo (two words)
3. Tahiti and nearby islands were formed by _____
4. Kelly Slater calls Raimana the _____ of Teahupo'o.
5. Where did Kelly Slater learn to surf?
6. Many of Tahiti's greatest waves originate in the ocean around _____
9. According to a Tahitian legend, an ancient warrior threw a _____ through a mountain on the island of Moorea.
10. The best time to go surfing in Tahiti is when the wind comes from the _____
12. Wavelets on the sea surface are shaped by turbulent _____
14. If the ocean floor near an island suddenly becomes shallow, a _____ breaker may be formed

Answers are on the back cover.

What is a Wave?

Sound waves, light waves, radio waves, microwaves, ocean waves, stadium waves, earthquake waves, slinky waves…waves are everywhere! But what are they?

When we see a wave, it often appears that something is moving from one place to another. In reality, we are seeing a disturbance moving through a solid, liquid, or gas. Particles of the solid, liquid, or gas may move, but the particles return to their original position after the wave passes. In a stadium wave, the fans raise their hands, then put their hands down. After the wave passes, everyone is still where they were before the wave arrived. The only thing that actually moved from one place to another was the energy of the wave.

Some waves, such as radio waves, light waves, and microwaves do not involve a solid, liquid, or gas at all. These waves consist of an electric field and a magnetic field, and are called electromagnetic waves.

Ocean waves are produced by interaction between wind and the surface of the ocean. The size of ocean waves depends upon the strength of the wind, how long the wind blows, and the distance over which the wind blows. The distance over which the wind blows is called the wind's "fetch."

Make a Portable Wave

You will need:

- A clear plastic bottle, about 20 oz (600 ml) size or smaller
- Rubbing alcohol, enough to fill the bottle half-way
- Mineral spirits, enough to fill the bottle half-way
- Food coloring, a few drops; you choose the color

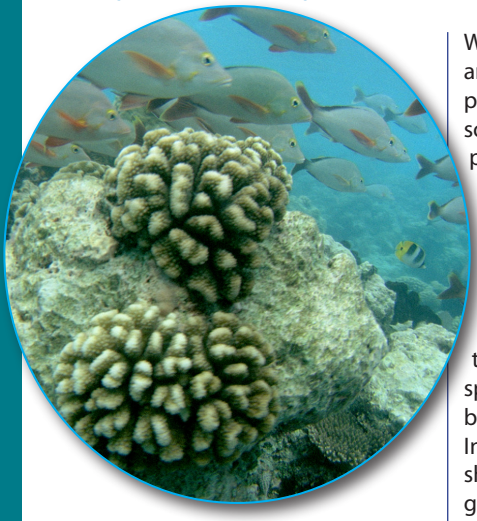
Directions

Do these steps in a sink with help from an adult:

1. Fill the bottle half-way with rubbing alcohol.
2. Add three or four drops of food coloring to the alcohol and shake to mix.
3. Add mineral spirits to fill the bottle and put the top onto the bottle. Be sure the top is tight!
4. Hold bottle horizontally until the layers separate, then raise and lower one end to create waves.

For more information about different types of waves and wave features, see *The Ultimate Wave Tahiti Educator's Guide*:
http://www.ultimatewavetahiti.com/wp-content/themes/ultimate_wave/uploads/2010/01/UltimateWaveTG.pdf

Volcanic Islands



Volcanoes happen where liquid rock (magma) erupts through Earth's crust. This can be caused by movement of the large plates that make up the Earth's crust, and can also happen at places known as hotspots. Tahiti and the other islands of French Polynesia, the Hawaiian Islands, and Yellowstone National Park are examples of volcanic activity caused by hotspots.

When volcanic islands form in tropical areas, coral reefs can be an important part of island development. On some islands, the limestone rock produced by reef-building corals may completely cover the underlying volcanic rock (the island of Bermuda and the state of Florida are two places where this has happened). Corals are living animals, and coral reefs provide food and shelter to thousands of other plant and animal species. Coral reefs also help protect beaches and shorelines from waves. In places like Teahupoo, corals help shape the sea bottom to produce the giant plunging breakers seen in *The Ultimate Wave Tahiti*.

Kelly Slater says that he has seen coral reefs beginning to disappear all over the world. The reason is a combination of pollution, climate change, overfishing, and invasive species that do not normally live in coral reef environments.

Make a Model Volcano

You can find lots of ideas at the Volcano World Web site:
http://volcano.oregonstate.edu/education/models/index.html

Make an Edible Coral Reef Model

Visit http://celebrating200years.noaa.gov/edufun/book/Makeanediblecoralreef.pdf

Help Save Coral Reefs

Visit "Things You Can Do to Protect Coral Reefs," from NOAA's Coral Reef Conservation Program:
http://coralreef.noaa.gov/getinvolved/whatyoucando/welcome.html

For more information about volcanic islands and coral reefs, see *The Ultimate Wave Tahiti Educator's Guide*: http://www.ultimatewavetahiti.com/wp-content/themes/ultimate_wave/uploads/2010/01/UltimateWaveTG.pdf

The Ocean People

The ocean is an essential part of the history, culture and everyday life in French Polynesia. The first Europeans who visited these islands in the 16th century were surprised to find anyone living there. They were even more surprised when they discovered that the Polynesians did not have ocean-going ships, navigational instruments, or even metal. Since the languages spoken on different Polynesian islands were nearly identical, it seemed obvious that the Polynesian ancestors must have been able to make ocean voyages over long distances. But no one could explain how they could have sailed and navigated over 10 million square miles of the Pacific Ocean.

Finally, in 1973, the Polynesian Voyaging Society was founded to explain the mystery. Since then, the Society has built replicas of ancient canoes and completed several voyages in the South Pacific that prove these vessels are capable of long-distance ocean travel. These voyages were made using ancient methods of navigation known as wayfinding, and have shown that ancestors of modern-day Polynesians had unique technologies that allowed them to explore and settle Tahiti and its neighboring islands.

Learn About Wayfinding

Find out more about wayfinding and Polynesian voyaging canoes at the Polynesian Voyaging Society Web site: http://pvs.kcc.hawaii.edu/index.html

In addition to descriptions of canoes, wayfinding methods, and Polynesian migrations, you will find details about food and everyday life aboard a voyaging canoe.

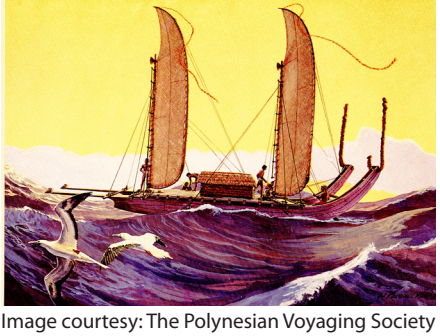


Image courtesy: The Polynesian Voyaging Society Archives at the Kamehameha Schools Archives (http://pvs.kcc.hawaii.edu/L2migrations.html)

Caution: Answers! Do NOT Peek!

Answers for page 1:

1. Bigger waves offer more surface to the wind, and a rougher sea surface promotes more air turbulence.

2. Raimana didn't become a championship surfer because he didn't want to compromise his family.

3. Bleeding from falling onto a reef would increase the danger from sharks.

4. Early explorers knew they were approaching Tahiti because they could smell the island's flowers.

5. Volcanoes are necessary for coral reefs around Tahiti because without volcanoes the sea bottom would be ten thousand feet deep, in total darkness, and the water temperature would be near freezing.

6. Ancestors of modern Tahitians first reached the island in small canoes.

7. Kelly Slater has noticed that coral reefs all over the world are disappearing.

8. There are 118 islands in French Polynesia.

Crossword Puzzle Answers: