

Modern movie depicts ancient methods of navigation

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Moana uses traditional celestial techniques to navigate across the sea. Photo from Flickr.

People from a group of islands called Polynesia colonized the vast Pacific Ocean about 3,500 years ago. It is one of the greatest things humans have ever done. They did it thanks to their sophisticated knowledge of the stars.

The Disney film "Moana" has drawn attention to these triumphs. The movie has helped inform a new generation about how these people understood the stars.

Polynesia forms a triangle across the Pacific. Hawaii is to the north, Rapa Nui (Easter Island) is to the southeast and Aotearoa (New Zealand) is to the southwest. Tahiti is in the center.

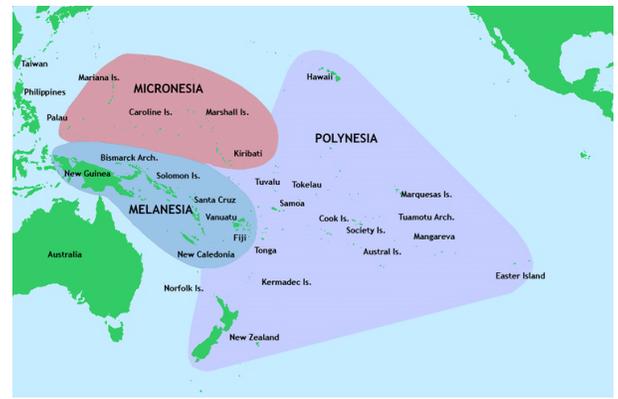
Polynesian voyaging extends beyond this triangle, though. Polynesians likely reached the coast of South America and islands near Antarctica.

"Moana" shows how Polynesians traveled. The main character uses traditional ways of navigating across the sea.

Disney asked experts to help with the film. They made sure the film was correct about Polynesian culture.

Memorizing Where The Stars Rise And Set

To navigate the huge Pacific Ocean, Polynesian voyagers needed to map the stars to figure out their position. Nainoa Thompson is the president of the Navigator and Polynesian Voyaging Society. He explains that you need to see where the stars rise and set. If you memorize that, you can find your direction.



So what are some of the ways they navigated?

To figure out their position on Earth, Polynesian voyagers memorized maps of the stars. They also used the angle of stars above the horizon to determine their position. For example, the top and bottom stars of the Southern Cross, a group of stars, are separated by 6 degrees.

When the distance between those stars is equal to the bottom star's distance from the horizon, you are as far north as Honolulu, Hawaii. When the stars Sirius and Pollux set at the same time, you are as far south as Tahiti.

Voyagers measure the angles between stars and the horizon using their hands. The width of your pinkie finger is about 1 degree.

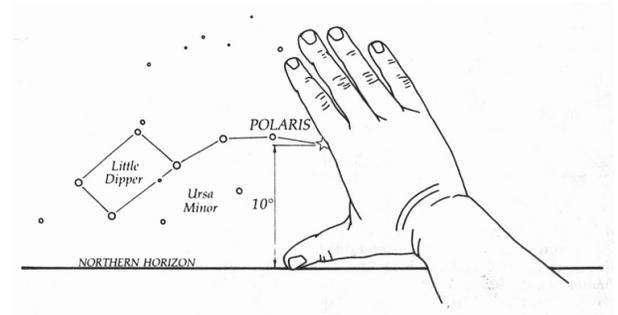
Hold your hand with the palm facing outward and thumb out, touching the horizon. Each part of your hand is used to measure a particular height.

Moana Uses Her Hands To Measure

In Hawaii, the "North Star" is called Hokupa'a, meaning "fixed star." It lies close to the north pole. The height of Hokupa'a shows how far north you are.

In the film, we see Moana Waialiki using this to measure the height of a group of stars. She's measuring the stars in Orion's Belt. The position of Moana's hand shows the star above her pointer finger has a height of 21 degrees. The movie takes place about 2,000 years ago, near Samoa. The position of Orion shows they are traveling east.

Later in the film, we see Moana navigating by following Maui's fish hook. In Polynesian traditions, the hook was used to pull islands from the sea. It is represented by the star group Scorpius, which rises when the sun sets in May. This shows they are traveling southeast.



Aboriginal People Used Star Maps Too

The stars move over time. Polynesians have been exploring the Pacific for more than 3,500 years. The stars have slowly shifted in that time.

From Samoa, the Southern Cross has lowered. Over the last 3,500 years, it moved from a 60 degree height to 41 degrees today. People navigating by the stars must slowly adjust their measurements.

Aboriginal people are another group of people that used star maps thousands of years ago. When European colonists arrived in Australia, they knew little about how Aboriginal people traveled. Aboriginal people had been in Australia for thousands of years before Europeans arrived. Aboriginals developed star maps to link the sky with the land and create trade routes across Australia.

People around the world depended on the stars to know where to travel. Try measuring the positions of the stars with your own hands tonight. It's actually quite fun!

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Quiz

- 1 Read the introduction [paragraphs 1-6].
Select the paragraph that shows how Disney learned about Polynesian methods of navigating across the ocean.
- 2 Read the section "Memorizing Where The Stars Rise And Set."
Which sentence from the section shows why Polynesian voyagers learned maps of stars?
- (A) If you memorize that, you can find your direction.
 - (B) For example, the top and bottom stars of the Southern Cross, a group of stars, are separated by 6 degrees.
 - (C) When the stars Sirius and Pollux set at the same time, you are as far south as Tahiti.
 - (D) Voyagers measure the angles between stars and the horizon using their hands.
- 3 Examine the map in the introduction [paragraphs 1-6].
HOW does the map support the information in the section?
- (A) It supports the idea that the Polynesians must have reached South America by labeling it on a map.
 - (B) It supports the idea that the Polynesian travel was impressive by showing how far they traveled in the Pacific Ocean.
 - (C) It supports the idea that Disney made sure they showed Polynesian travel correctly by highlighting their research on the Polynesian islands.
 - (D) It supports the idea that "Moana" is helping people learn more about the Polynesian culture by showing how many islands played in the movie.
- 4 Use the information in the article and the image in the section "Moana Uses Her Hands To Measure" to select the TRUE statement.
- (A) When measuring stars, the position of your pointer finger isn't important.
 - (B) The Little Dipper is farther north than Polaris.
 - (C) Polaris is 10 degrees away from the Northern Horizon.
 - (D) Ursa Minor is the easiest star to measure.