



United Nations
Educational, Scientific and
Cultural Organization

Apia Office
Cluster Office
for the Pacific States



Education
for Sustainable
Development

Among the World's First Gardeners: The Kuk Early Agricultural World Heritage Site

2



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COUNTRY: Papua New Guinea

INTENDED AGE GROUP: Grade 6 or age 12–13

CATEGORIES: Environmental studies,
language and literacy, social
studies, social science and
the arts

Our **PACIFIC** Heritage

**SUSTAINABLE
DEVELOPMENT
IN YOUNG
HANDS**

Cover photo: Gardening in the Western Highlands, Papua New Guinea

Photo: Jack Golson

Source: <http://whc.unesco.org/en/list/887>

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Unit Abstract

This unit has been developed to teach students about the Kuk Early Agricultural World Heritage Site in Papua New Guinea and actions they can take to actively preserve their own cultural and natural heritage. While the emphasis is on Kuk, there are other important heritage sites in the Pacific. By learning about the Kuk Early Agricultural World Heritage Site, students will gain valuable knowledge and skills to help protect and preserve natural and cultural heritage throughout the Pacific.

Kuk became a World Heritage Site in 2008. The site includes Kuk Swamp, which holds some of the earliest evidence of agriculture in the world. Evidence suggests that agriculture started in Papua New Guinea 10,000 years ago. The Kuk Early Agricultural World Heritage Site is extremely important. It is where humans made the transition from hunting and gathering (foraging) to gardening and agriculture. This transition occurred independently in a small number of places worldwide. It involved a significant leap in agricultural technological invention. It led to an increased food supply, which supported a larger population. This change shaped cultural and community development throughout our Pacific region.

Because gardening techniques in Papua New Guinea have not changed significantly for thousands of years, some Papua New Guineans do not understand why the Kuk Early Agricultural Site is so valuable or why it is internationally recognised and celebrated as a World Heritage Site.

This unit is not about our past, even though it draws from our history. It is about our future. Cultural and natural heritage is extremely important for future generations. Students are our future decision makers. It is important that they think about culture and heritage.

The unit will help students understand why the Kuk Early Agricultural Site is important for exploring the cultural and natural heritage of Papua New Guinea, the Pacific region and the global community. The unit provides an opportunity for students to gain a deeper understanding of human relationships with natural systems and how this translates into our modern world. By studying the site, students will be able to explore Kuk from different perspectives, including cultural values, human evolution and archaeology. They will begin to understand the importance of their own heritage and the importance of its protection for the future of the Pacific.

Within the unit, the terms “agriculture” and “gardening” are used interchangeably.

How to Use This Unit

This unit includes student activities that draw on curriculum links to environmental studies, language and literacy, social studies, social science and the arts. Each activity uses modes of learning that reflect a teaching approach called Education for Sustainable Development (ESD). ESD aims to integrate the principles, values and practices of sustainable development into all aspects of education and learning. This will help students understand the complexity of the world around them. ESD strives to equip students with life skills that will enable them to contribute to a sustainable future for their communities. Complementing this approach is an inquiry process that is focused on developing students' critical thinking and problem-solving skills in order to increase their knowledge, challenge their attitudes and develop their citizenship skills. Activities in the unit involve your students in finding out, sorting out, drawing conclusions and planning.

There are seven suggested student activities. They include:

- Information for you (the teacher)
- Photocopy masters of information to give to your students (the student handouts)
- Photocopy masters of student activity sheets

These activities are offered as a guide only. Responses and discussions do not need to be limited to the suggestions in this unit.

This unit is in plain English to support translation into local languages.



Archaeological excavations at the Kuk Early Agricultural Site

Photo: E. C. Harris **Source:** <http://whc.unesco.org/en/list/997>. Copyright © Jack Golson 1977, reproduced with permission

Relevant Curriculum Links

- Environmental Studies** This unit links to teaching and learning about the environment. Students will explore the long history of human interaction with the environment in Papua New Guinea.
- Social Science** Students will learn about the agricultural and natural living history of Papua New Guinea and the archaeological findings that contribute to building a nation.
- Language and Literacy** Students will learn about and use modern and historical Papua New Guinea agricultural and cultural vocabulary. They will present information accurately and coherently.
- Social Studies** The unit examines the agricultural developments at Kuk that contributed to the growth of societies in Oceania. Students will explore the implications of changes for people and the environment.
- The Arts** Students will use art to critically reflect on events in history and think about the future.
- National Studies** Students will reflect on how Kuk links to national identity and modern agricultural practices. They will investigate how agricultural practices contribute to local and Pacific identity.



Agriculture began in Papua New Guinea 10,000 years ago.

Source: Our Place The World Heritage Collection. Copyright © Our Place The World Heritage Collection, reproduced with permission

Unit Objectives

Knowledge

To help students develop knowledge about and an understanding of:

- The cultural values of the Kuk Agricultural Site and why it is on the World Heritage List
- The need to conserve the Kuk Agricultural Site for its national, Pacific and global conservation values
- The relationship between this site and other World Heritage sites, including what they have in common and what some of the differences are
- The role of conservation of sites such as Kuk in sustainable development and the potential impact of development on World Heritage sites

Attitudes

To encourage students to:

- Appreciate the significance of the Kuk Agricultural Site to modern gardening traditions in Papua New Guinea and throughout the Pacific region
- Value local and regional heritage sites
- Value efforts to maintain and conserve heritage sites in order to document and celebrate our past and create a sustainable future
- Become protectors and promoters of their own cultural and natural heritage

Skills

To help students to develop their ability to:

- Carry out individual, team and community-based collaborative research
- Develop critical thinking and reasoning skills in order to understand the complexity of the world around them
- Make links between different kinds of cross-disciplinary information in what they are studying
- Promote and explain their attitudes and commitment to preserving heritage for the present and future generations

Suggested Student Activity I

Exploring UNESCO World Heritage Sites around the World: Values of People and Place

Objective:

For students to understand the cultural and environmental values that make UNESCO World Heritage sites important to the whole world

Your students could:

- Contribute to a brainstorm activity. On the board or a flipchart, draw two columns: one with the heading “cultural heritage” and the other with the heading “natural heritage”. Ask the students to give examples for each column. When they have finished, identify some examples of mixed heritage. Ask them what their life would be like without their heritage. Ask them how much they currently know about the things they listed under the cultural heritage heading.
- Use the ‘Values of People and Place’ student activity sheets on pages 10–11. Working in pairs or small groups, have the students discuss and record their answers to the questions on the activity sheet.

To deconstruct the activity in ‘Values of People and Place’, focus on values of cultural and natural heritage and the differences and connections between the two types of heritage.

Where appropriate, ask the students, “Why do you feel/think that?” to encourage them to critically reflect on their answers. Get them to give reasons that substantiate their answers.

- You could also discuss the differences between materials used in the Angkor temples and some of our traditional building materials here in the Pacific. Note that, because we historically used natural materials, including timber, leaves and thatch, many of our buildings have rotted away over time. This means that we do not have as much lasting architectural heritage as some other cultures, though we do have ancient stone structures in places such as Pohnpei and Tonga. Discuss the positive and negative heritage and environmental aspects of this with your students.

DISCUSSION



ACTIVITY



DISCUSSION



KUK EARLY AGRICULTURAL WORLD HERITAGE SITE

HANDOUT



The Kuk Early Agricultural Site is located in the western highlands of Papua New Guinea. It became a UNESCO World Heritage Site in 2008.



10,000 Years of Gardening

The archaeological remains found at Kuk Swamp prove that gardening first started in Papua New Guinea at least 10,000 years ago. The evidence that researchers and the local Kawelka people have found below the ground at Kuk Swamp shows that gardening techniques used thousands of years ago were very similar to gardening techniques practised by people in Papua New Guinea today.

The World's First Gardeners

Many people find the mountains of Papua New Guinea a surprising place to find evidence of the world's first gardeners. Beginning in the 1960s, a team of archaeologists began digging pits at Kuk Swamp and uncovered evidence to explain the history of agriculture in the Pacific region. Kuk Swamp is a very important site of independent agricultural development.



Gardening at Kuk Swamp 10,000 years ago

*Illustration: Scott Pearson
Copyright © UNESCO*

The beginning of agriculture is one of the most important developments in human history. What clever ancestors we had. Large amounts of time, such as 10,000 years, are hard to imagine, but just think about our grandparents 500 generations ago experimenting with gardening for the very first time!

The invention of gardening changed our lives, but it is not something we stop to think about very often. Gardening enables us to grow more food. More food meant that more people could live in the highlands.

Beliefs, Values and Attitudes

World Heritage sites such as Kuk are not just old historical and cultural remains from our past. They form an important part of our current beliefs, values and attitudes. They help us to think about the future. Let's explore how and why the things we are finding out at Kuk are so important.

World Heritage

The Kuk Agricultural Site is part of the world's heritage. Heritage is something we inherit from the past. It is what we live with today. It is something we pass on to future generations. There are two main types of heritage: cultural heritage and natural heritage.

- Cultural heritage is the culture we inherit from our ancestors. It includes using spears for hunting and shells for money, traditional food, music, songs, dance, stories and arts and crafts.
- Natural heritage includes the traditional landscapes we have inherited (for example, volcanoes, hills, rivers and old growth forests).

Some of the things we inherit are a mixture of our cultural and natural heritage, such as dance grounds and burial places, which provide cultural landscapes and space.

Our cultural and natural heritages are sources of life and inspiration for our modern communities and our personal and national identities.

Another way of thinking about heritage is to think about places and objects we wish to keep safe for the future. We value our cultural and natural heritages because they come to us from our ancestors, they are beautiful and they are scientifically important and irreplaceable.

In many ways, our heritage reflects the continuity of communities and their identity and the lives of our ancestors. It survives today only because of the special efforts they made to look after it.

Can you imagine your life without heritage? Think about this question in relation to the place where you live. What things in your environment represent the past? What things should be kept safe for the future? What could be replaced? What could not be replaced?

The world's heritage is made up of some very unique places, including the grasslands of East Africa's Serengeti, the pyramids of Egypt, the Great Barrier Reef in Australia and the East Rennell World Heritage Site in the Solomon Islands.

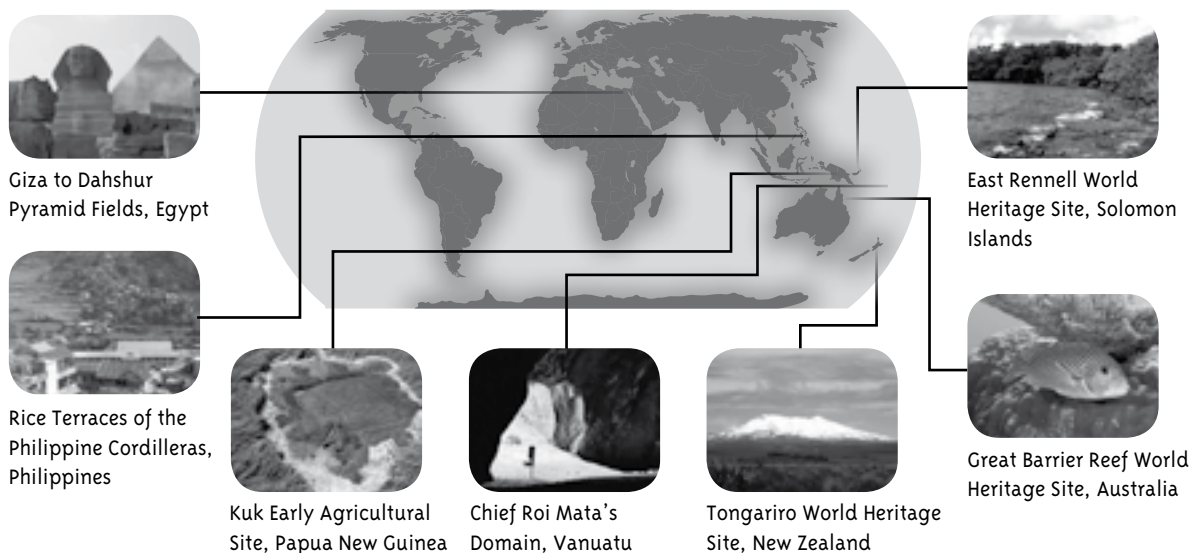


The Great Barrier Reef stretches from the Coral Sea south of Papua New Guinea down the northeast coast of Australia.

Source : World Heritage Collection, UNESCO database

United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage sites belong to all the people of the world, no matter where the sites are. The Convention for the Protection of Cultural and Natural Heritage, which was adopted in 1972 and is known as the World Heritage Convention, protects and preserves cultural and natural heritage around the world of outstanding value to everyone. The Kuk Agricultural Site has this status. Some other UNESCO World Heritage sites are shown on the map. Each site has a cultural, natural or mixed world heritage value.

Some World Heritage Sites



Source : World Heritage Collection, UNESCO database

ACTIVITY



STUDENT ACTIVITY SHEETS

Values of People and Place

Look at the pictures and descriptions of the two World Heritage sites on page 11. Work in small groups to discuss and record your answers to the following questions.

1. Why do you think these sites are important and valuable to the heritage of everyone in the world?
2. How are these sites different from your own cultural and natural heritage sites?
3. What would your life be like today without cultural heritage?
4. What would your future be like without heritage?
5. Describe a place you have visited that you value and think of as a special place (for example, a place with remarkable carvings, unique landforms, spectacular natural beauty or somewhere with amazing plants or animals). Explain why this place is a special place to you and why you think it should be protected. How do you plan to look after it so that it will still be there in the future?

World Heritage Site 1: The Banyan Temple, Angkor, Cambodia



Banyan Temple, Angkor, Cambodia

Photo: F. Bandarin
Source: The World Heritage Collection, UNESCO database

Angkor is one of the most important archaeological sites in Southeast Asia. The cultural heritage of Cambodia can be seen in a group of temples that form part of the ancient capital of the Khmer empire.

World Heritage Site 2: Cocos Island National Park, Costa Rica



Cocos Island National Park is located 550 km off the coast of Costa Rica. Its outstanding natural heritage includes a high diversity of marine species, such as sharks, rays, tuna and dolphins.

Cocos Island National Park, Costa Rica

Photo: Mario Santana
Source: The World Heritage Collection, UNESCO database

ROLE PLAY



RESEARCH



Suggested Student Activity 2

Creating a Mini Museum of Movable Heritage

Objective:

For students to participate in inquiry and evidence-based learning, reflecting on and celebrating the importance, value and protection of movable heritage

Your students could:

- Use the 'Creating a Mini Museum of Movable Heritage' student activity sheets on pages 13–14. Please refer to page 13 for the meaning of movable heritage.

In this activity, encourage your students to utilise knowledge from elders in their community. Have them do mini interviews about a piece of movable heritage (inquiry based learning). Have them collect information from their family and present their findings in class for further reflection and discussion.

To brief students on movable heritage in preparation for creating a mini museum of movable heritage, you could share with the students an object you own (for example, a photograph, a piece of bride-price jewellery, a family Bible or a fine mat) that has been passed down to you through the generations that you cherish and value. Tell the students the story of the object and explain that the object is an example of movable heritage because it can be moved and transported easily.

Ask the students to talk with their families about a movable heritage object that they value. Have them bring it to class to share in the mini museum. See the activity sheet for more details about how to conduct the museum and protect the objects.

STUDENT ACTIVITY SHEETS

ACTIVITY



Create a Mini Museum of Movable Heritage

Immovable Heritage

Cultural and natural heritage that you cannot move or take from one place to another is called immovable heritage. Now let's learn some fun and interesting facts and stories about heritage that can be moved. This type of heritage is called movable heritage.

Movable Heritage

1. Find a small movable-heritage object (an object that can be taken from one place to another) in your home that you value or cherish and that has been handed down to your family by an older relative.
2. Develop some interview questions to ask an older relative about the movable-heritage object. Your questions might include:
 - How long have we had this object?
 - What is your happiest memory of the object?
 - How do you feel about the object today?
 - How has the object been looked after in the past to make sure that it is still here today?

Make up more questions of your own and write them down on the back of this sheet.

3. Use your list of questions to interview an elder to find out the story of the object.

Write the main parts of their story here:

4. Ask an adult's permission to bring the movable-heritage object to school for a day.
5. Write a short description of the object that can be placed next to it in the classroom mini museum. In the description, include:
 - The name of the object
 - Where it was from originally
 - What it is made of
 - What it was/is used for
 - When it was made

Here is an example:

Tapa cloth from the Lau Group, Fiji. The cloth is made from tapa and natural dye. It was part of my mother's wedding outfit. It was made in the 1970s.

Write your description here:

6. With your teacher and the other students, create a temporary mini museum by putting your and the other students' objects and descriptions on display around the classroom.
7. Move quietly, carefully and respectfully around the mini museum, taking turns at being the curator (the person in charge of the museum collection). When it is your turn to be the curator, share the story that belongs to your object and explain to the other students why the object is valuable to you and your family.
8. With the other students and your teacher, discuss why you want to pass your movable-heritage object on to your descendants. Discuss how you plan to protect and preserve your object for the future.

Suggested Student Activity 3

Thinking about Our Shared Future

Objective:

For students to understand and reflect on the importance of the values incorporated in the Kuk Early Agricultural Site and develop a positive orientation towards the future

Your students could:

- Imagine the future while taking part in a survey.

This unit requires students to visualise and reflect on findings from the past. The activity sheet on page 19 calls for students to use the information in the student handout 'Papua New Guinea, a Birthplace of Early Gardeners' on pages 16–18 to think about the future.

Research has shown that students who are able to see the future in a positive way can negotiate their lives in more effective ways than those who see a poor future for themselves or their communities. The survey on the activity sheet is open-ended. There are no wrong or right answers.

Help your students to share their thoughts and feelings about the future with other students in such a way that they develop a positive view of the future.

It is important to debrief and “unpack” this activity with the students. Explore the reasons behind their feelings with them and ask them to articulate and share these reasons in a non-threatening atmosphere. The activity provides an opportunity to explore both positive and negative options. However, ensure that the activity ends on a positive note.

After completing the activity sheet, you may wish to use the following extension statements. With the class, discuss the students' feelings towards the following:

- It is important to preserve the Kuk Early Agricultural Site for future generations.
- Twenty years from now, I will be proud of the Kuk Early Agricultural Site and the role it has in the heritage of Papua New Guinea and the Pacific.

VISUAL SESSION



DISCUSSION

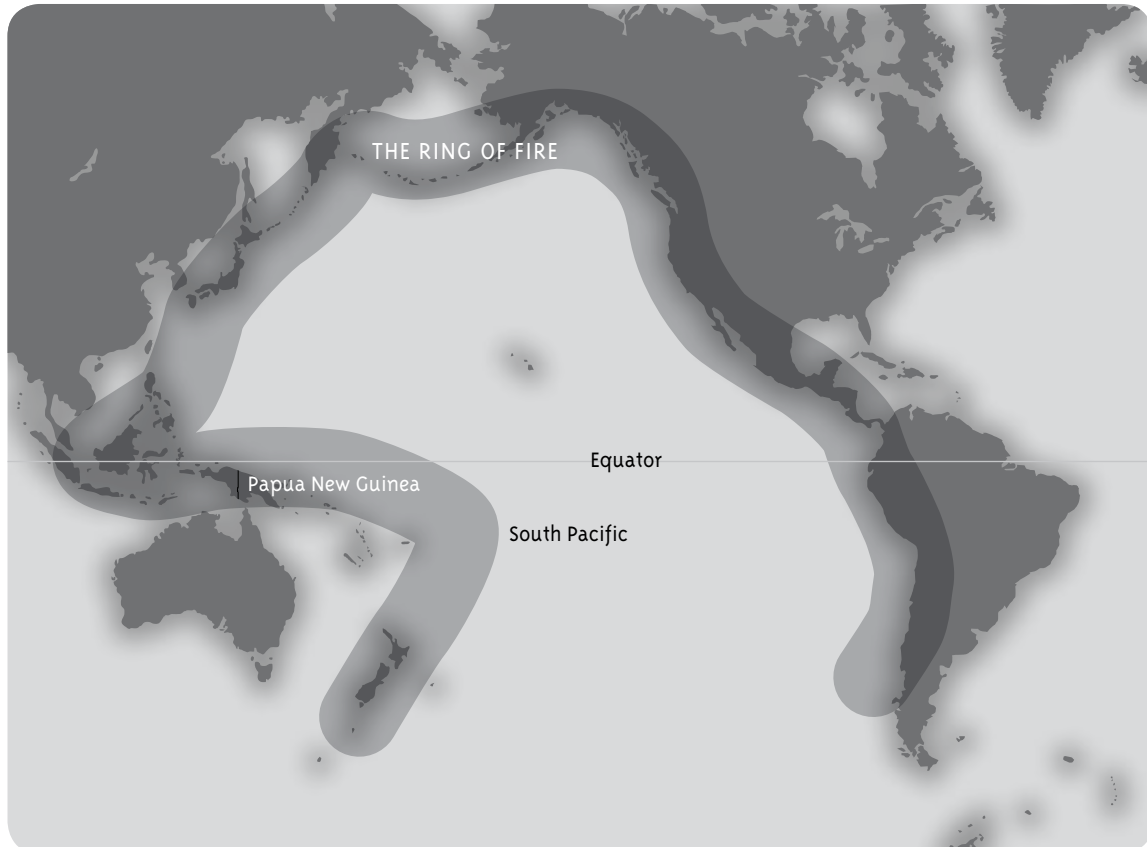


HANDOUT



PAPUA NEW GUINEA: A BIRTHPLACE OF EARLY GARDENERS

Papua New Guinea is located in the South Pacific, close to the equator, on the Ring of Fire.



Papua New Guinea has a rich cultural heritage based on continuous settlement that stretches back about 50,000 years to the last ice age. Migrations into the cold interior of Papua New Guinea took place around 30,000 years ago when the mountains, including Mount Hagen near Kuk Swamp, were covered in permanent ice and snow. At this time, the people of Papua New Guinea were hunters and gatherers. By 10,000 years ago, Papua New Guinea highlanders were developing gardens. Surplus crops led to extensive trade networks.

The first European visitors to Papua New Guinea were the Portuguese navigator Don Jorge de Meneses and his crew. They visited in 1526–1527. He named the island Ilhas dos Papuas, which means “land of the fuzzy-haired people”. When the Spaniard Ynigo Ortiz de Retez visited the island in 1545, he called it New Guinea, because he thought the local people looked like the people who live on the Guinea coast of Africa.

In the 19th century, missionaries and European traders established themselves on the island. Later, the Germans, British, Dutch, Japanese and Australians all tried to settle or become the governing power.

In 1975, Papua New Guinea celebrated its independence from Australia. The northwest part of the main island is now part of Indonesia.

Modern Papua New Guineans celebrate their diverse languages, cultural traditions and rich history of living in and with the land and the sea. Given its long history, cultural diversity and communal spirit, Papua New Guinea is in a position to make a positive contribution towards finding solutions to many modern problems. Notably, Papua New Guineans have developed some of the most effective traditional systems in the world for managing the environment.

Kuk Swamp

The Kuk Early Agricultural Site includes 116 ha of swamps located in the Upper Wahgi Valley, approximately 12.5 km northeast of Mount Hagen in the Western Highlands Province of Papua New Guinea. The Upper Wahgi Valley is one of the largest valleys in the spine-like mountains that run from east to west across the centre of the island. Mount Okka, an extinct volcano, is nearby.

The Kawelka tribe lives on the edge of the Kuk Early Agricultural Site. Like all tribes, their life is closely attached to their land and its natural resources.



The Upper Wahgi Valley with Kuk in the foreground

Photo: Tim Denham. Copyright © Tim Denham and UNESCO 1998, reproduced with permission

A World Cradle of Agriculture

Separate groups of humans first started gardening thousands of years ago. Agriculture originated in different places and then spread to the rest of the world. Evidence of agricultural inventions have been found in six locations, including in Southwest Asia, southeast China, the Americas, Papua New Guinea and Africa. Each location invented different gardening techniques, depending on the crops they grew. The birthplaces of agriculture are:

Date	Region where agriculture developed independently
11,000 years ago	Fertile Crescent of the Middle East
10,000 years ago	Kuk Swamp in the Papua New Guinea highlands
9,000 years ago	Yangtze and Yellow river basins in China
9,000 years ago	Tropical regions of North and South America, including Mexico
4,000 years ago	Eastern woodlands of the United States
5,000–4,000 years ago	Sub-Saharan Africa

Source: Adapted from Bellwood (2005)

Findings from Kuk suggest that Papua New Guinea was one of the first places in the world where agriculture was developed.



Change

Many changes occur when groups of people move from hunting and gathering their food into settled gardening communities. Changes include bigger populations once more food is reliably available. In some places, this change led to the first cities.

In the last 20 to 50 years, the food available to us here in the Pacific has changed a lot. What changes do you think have happened? Why do you think these changes have occurred? What are some of the positive and negative effects of the changes in food available to us? What does it mean for our health, our families and our lives now and in the future?

Spring onions may have originated in the Fertile Crescent of the Middle East.

*Source: Our Place The World Heritage Collection
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STUDENT ACTIVITY SHEET

ACTIVITY



What Will Your Future Look Like?

So far, we have learnt a little bit about the history of Papua New Guinea and its first gardeners. The purpose of the survey below is to find out what you think about your future, the future of people in the Pacific and the future of all humans on the planet.

Read the statements on the left and tick the option on the right that best shows your feelings. There are no wrong or right answers.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
All humans on the planet are moving towards a better future.					
In 20 years from now, the Pacific is going to be very different from today.					
It is possible to predict (be able to tell) what will happen in the future.					
Studying our past will help us to solve our problems in the future.					
There are many different possible futures available to us in the Pacific.					
I am able to control my own future.					



What will the future be like?

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Suggested Student Activity 4

Reflecting on the Lives of the First Gardeners

Objective:

For students to understand Kuk in the context of:

- The importance of archaeology to learning about heritage and history
- Exploring issues related to food security
- Valuing intergenerational ecological knowledge

Your students could:

- Work in small groups to draw and illustrate a timeline for the Kuk Early Agricultural Site that clearly shows the timing and evolution of agricultural and gardening practices, the types of crops grown and the gardening techniques used.
- Use the 'What's on the Kuk Menu?' student activity sheets on pages 27–29.
- Take part in a classroom discussion based on the following questions:
 1. How much have gardening practices in Papua New Guinea changed in the last 10,000 years?
 - a. What does this say about the importance of learning farming and gardening knowledge by listening to stories from our elders?
 - b. In the future, how important will it be for us to tell our own children stories about our heritage? Give reasons for your answer.
 2. What impact has the invention of gardening had on the size and location of our Pacific communities over time?



Ecological knowledge is passed down from one generation to the next.

Source: Our Place The World Heritage Collection. Copyright © Our Place The World Heritage Collection, reproduced with permission

VISUAL SESSION



- Use the 'You're an Archaeologist!' student activity on page 26 and imagine being an archaeologist.

To facilitate the activity in 'You're an Archaeologist!', have the students spend a few minutes with their eyes closed imagining being archaeologists working at the Kuk site in the 1970s. This activity may work best after lunch or at the end of the school day, when the students are ready to relax. After a few minutes of visualisation, ask them to open their eyes and complete the sentences on the activity sheet. Afterwards, ask them to share their answers with the class. Write all their responses on the board to gather a full collection of the "sights, sounds and smells" that they imagined while their eyes were closed. Be aware that the colour of root vegetables can vary considerably between varieties and between (and within) locations. For example, taro can be white, grey, pink, purple and yellow. Once all the words are on the board, you could ask the students to form small groups and write a poem about the Kuk Swamp research, using words from the collection on the board.

To deconstruct answers from questions 1a, 1b and 2 above, first focus on some points of agreement between the students, and then on some points where their responses are different. After each group presents, ask if other students have similar findings. Where appropriate, ask the students, "Why do you feel/think that?", to encourage them to critically reflect and give reasons to substantiate their answers.

Discuss the positive and negative aspects, as well as the implications of their answers for the future, with your students.



What's on the Kuk menu?

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VISUAL SESSION



ACTIVITY



DISCUSSION



DISCUSSION



HANDOUT



A SWAMP WITH A SURPRISING STORY TO TELL

The archaeologists and the Kawelka people realised that they were uncovering an amazing time capsule of importance to the whole world when they began finding evidence of early gardening in Kuk Swamp.



The Kawelka people knew that their swamp had a story to tell. These men are holding wooden digging implements that were dug up at the Kuk site.

Photo: Bob Mitten

Source: Papua New Guinea National Commission for UNESCO. Copyright © Jack Golson 1975, reproduced with permission

The evidence they found beneath the soil helped them to piece together part of a global-history puzzle. The remains and artefacts gave them details about the lives and diets of people who had lived in Kuk Swamp thousands of years ago. They were able to date things such as seeds, pollen and pieces of wood that they found deep in the soil. They were able to work out what the local environment and climate were like long ago, as well as what the early human culture was like in the area. From these discoveries, we can begin to understand what the past looked like.

Memories from the Swamp

Cherie Rohn was part of the research team that worked with archaeologist Jack Golson and the Kawelka highlanders in 1977. Cherie helped to map the swamp. A person who makes maps is called a cartographer.

Back in 1977, it was my good fortune to be part of the Kuk Station research team. I would go out daily with Ku, who was one of the highlanders. We would stay out at the swamp until the rains would drive us back to camp. Back at the camp, I would stand at the map table with a string attached to a weight. Ku would hold the weight over the spots where the mounds and ditches were located. I drew a line and measured the distances between the mounds and ditches, marking each one with a dot on the map. Ku and I then turned the field map into a real map. Working at Kuk Swamp is one of the happiest memories in my life. Imagine how exciting it was for a young woman to help with what has become one of the most important agricultural sites in the world!

A 10,000-year-old Piece of Taro

Archaeological findings at the site suggest that people started to experiment with clearing patches of rainforest and changing the pattern of the wetlands at Kuk 10,000 years ago.

While excavating the site, archaeologists discovered tiny parts of plants on old stone tools. Special machines that help to determine the date of plant material suggest that the tiny pieces of taro are around 10,000 years old. This date is very significant. It indicates that people in the highlands did not learn the knowledge and skills for gardening from other people – they must have developed the skills themselves. The small pieces of taro are proof that early humans in Papua New Guinea first started to plant starch-rich plants that are still common in the diet of Pacific people today.



Jack Golson excavating at Kuk in 1998

Photo: Tim Denham. Copyright © Tim Denham and UNESCO 1998, reproduced with permission

7,000-year-old Mounds

About 7,000 years ago, people started heavily cultivating the Kuk Swamp. They started to grow plants on mounds along the edge of the wetlands. The underground bases of the mounds can still be seen today in the deep soil. At the bottom of the mounds, they planted water-tolerant crops such as taro. On the tops of the mounds, they grew crops that prefer a drier environment, such as bananas and yams.



Growing plants on mounds

Source: Our Place The World Heritage Collection. Copyright © Our Place The World Heritage Collection, reproduced with permission

Taming the Banana

Research suggests that Papua New Guinea was the first place in the world to domesticate bananas. "Domesticating bananas" means that people started to purposely plant and control the growth of bananas, rather than just collect them in the wild.

We Preferred Suckers to Seeds

Papua New Guinea is one of the few places in the world where gardening started with domesticating wild plants. Early and modern gardening in Papua New Guinea and elsewhere in the Pacific is generally based on planting a cutting or other plant part, such as suckers and tubers. In most other places of the world, the first gardeners planted the seeds of cereals, legumes and other crops.

4,000-year-old Drainage Ditches

Evidence from the Kuk Swamp proves that it was 4,000 years ago that people first began to drain the swamp using ditches. The rectangular pattern of ditches at Kuk Swamp was uncovered by the research team. Kuk Swamp holds the oldest and best-preserved remains of the first drainage systems in Papua New Guinea. In the ditches and mounds, archaeologists found wooden digging sticks and paddle-shaped spades that are evidence of the early gardeners' tools.



Is this a 4,000-year-old drainage ditch?

Source: Our Place The World Heritage Collection. Copyright © Our Place The World Heritage Collection, reproduced with permission

Welcoming the Sweet Potato 200–300 Years Ago

Plants such as the sweet potato are relatively new to Kuk and the rest of the Pacific. They were introduced to Papua New Guinea 200–300 years ago. They originally grew only in South America.

Gardening Today

The way Papua New Guineans grow crops and garden today has not changed very much for thousands of years. Mounds and drainage ditches in wetlands are still used. At the Kuk Swamp, the Kawelka tribe use the ground for different purposes, including traditional vegetable and fruit gardens and small-scale crops of bananas and coffee to sell at local markets. People garden in small plots using machetes, spades and wooden digging sticks, much like the ones used in the past.



Digging sticks haven't changed much in 10,000 years.

Photo: Jack Golson

*Source: <http://whc.unesco.org/en/list/887>
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The findings from Kuk Swamp prove that there is a very long and special history behind modern gardening and cropping practices.

In other parts of Papua New Guinea, agriculture has changed over time to include deep drainage cultivation and growing deep-rooted trees for timber.

People have been gardening at Kuk for a long time.

*Source: Our Place The World Heritage Collection.
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ACTIVITY



STUDENT ACTIVITY SHEET

You're an Archaeologist!

Find a quiet place in the classroom and close your eyes for a few minutes. Imagine that you are part of Jack Golson's archaeological research team in the 1970s, working in the Wahgi Valley at Kuk Swamp. Imagine that you are walking around Kuk Swamp with the rest of the team. Imagine finding a new network of ditches and mounds after months of digging beneath the surface. Imagine finding parts of ancient tools deep down in the soil. Breathe in and out and look around the swamp. Imagine the sights, sounds and smells in Kuk Swamp. What can you see in the distance? Look, there's Mount Okka. Imagine finding a tiny piece of ancient taro after months of searching. Keep your eyes closed and let your mind focus on digging, mapping and exploring the Kuk site. Slowly come back to the present. When you are ready, quietly finish the following sentences about your journey back in time. Reflect on your experience as an archaeologist at Kuk Swamp.

At Kuk Swamp I saw

At Kuk Swamp I heard

At Kuk Swamp I could smell

At Kuk Swamp I found

At Kuk Swamp I learned

STUDENT ACTIVITY SHEETS

ACTIVITY



What's on the Kuk Menu?

Some of the main types of plants cultivated at Kuk are listed below. In the spaces, name the plant in your local language, describe what it tastes like and answer the other questions.

Our Old Friend Taro

Taro is a tropical plant grown for its root tuber, which is very nutritious. Before the introduction of sweet potato, taro was the most common crop grown in the highlands. The leaves are rich in vitamins.

Our local name for taro is

The colour of the flesh of a taro can be

A common cooking method for taro is

The taste and texture of cooked taro is



Taro

Yam

Yam is another nutritious vegetable.

Our local name for yam is

The colour of the flesh of a yam can be

The thick skin of a yam is coloured



Yam

Illustrations: Scott Pearson. Copyright © UNESCO.

Bananas, Bananas Everywhere!



Banana

Illustration: Scott Pearson. Copyright © UNESCO.

In Papua New Guinea, there are different kinds of bananas. Bananas are an important crop that many people enjoy.

Some of our local names for different kinds of bananas are

Draw two different types of banana and describe how they look and taste different.

Sweet Potato



Sweet potato

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The sweet potato was introduced to the Pacific around 200–300 years ago. This is a short time in human history. A local name for the sweet potato in the highlands is kaukau. Papua New Guineans grow many different varieties.

Name some other introduced crops that weren't grown in the Pacific thousands of years ago. (Here are some hints: we make a hot drink from one and another makes food taste hot.)

Reflective Questions

Where do most of the foods we eat come from?

Why is it important to have a wide variety of natural foods available to eat?

What can we do to ensure that these natural foods will always be available?

HANDOUT



HOW DID KUK BECOME A WORLD HERITAGE SITE?

Listing Kuk as a World Heritage Site was a long process that took many years of work. The nomination of Kuk was a national project that involved many organisations and people working together. The site is listed as a World Heritage site to celebrate, protect and preserve evidence of the important agricultural developments that happened in Papua New Guinea. Some of the key people and organisations involved are included below.

National Institutions Working Hand-in-hand

The nomination of Kuk for a UNESCO World Heritage listing was an initiative of the national government of Papua New Guinea. The Papua New Guinea National Museum and Art Gallery and the Department of the Environment and Conservation played big roles in helping to obtain the listing of this unique heritage site.

The Role of the Kawelka Tribe

It is very important that a World Heritage listing is supported by local communities, such as the Kawelka tribe and the other people who live near the Kuk site. Listing takes many years. During this time, communities talk about the possible positive and negative impacts of World Heritage status.

The most influential person in the Kawelka tribe – and in the highlands – is called the bigman. The bigman is a community leader whose influence is great – it is based on consensus rather than total control. The bigman in Kawelka talked with the community and with neighbouring communities during the nomination of the site for World Heritage status.

Who makes the big decisions in your community? How do they decide what is best for everyone? Is the process for decision making fair to all women, men, boys and girls in your community? Why or why not? How could decision making be improved so that everyone's voice is heard?

One Big Team with One Big Goal

Other people and organisations involved in the discussions about the World Heritage nomination included the Western Highlands Provincial Government, the University of Papua New Guinea, the National Research Institute, the Papua New Guinea National Commission for UNESCO, the Japanese Government and many dedicated local and international researchers.

Suggested Student Activity 5

World Heritage in the Media – *Kids Korner* PNG EMTV Interview

Objective:

For students to reflect on the value of the Kuk site (or another important heritage site) and develop the skills to clearly articulate its significance and importance for a sustainable future

Your students could:

- Imagine that they are the head of the Papua New Guinea National Museum and Art Gallery and are asked to do a TV interview on the day the Kuk Early Agricultural Site gained World Heritage listing in 2008.
- Interview a partner for one minute, pretending that they are taking part in the PNG EMTV show *Kids Korner*. They could describe their excitement about the World Heritage listing and the value of the site. They could talk about what the listing means to the people of Papua New Guinea and the rest of the world now and in the future. Use a pretend microphone, such as a ruler, for the interview.
- Present the role-played interviews to the class.

If you are doing this activity outside Papua New Guinea, adapt it to an important local heritage site valued by the people in your country.

ROLE PLAY



Suggested Student Activity 6

Managing World Heritage for the Future

Objective:

For students to start to understand the challenges and planning needed to sustainably look after the Kuk Early Agricultural World Heritage Site

Your students could:

- Divide into small groups and develop a management plan for the Kuk site using the 'Kuk Swamp Site Management Plan' activity sheets on pages 35–36. They could:
 - Brainstorm and list all the natural and cultural features to be managed.
 - List all the possible risks and pressures on each feature listed.
 - Formulate an action or solution to protect each feature and manage the risk/pressure listed (for example, an action to manage and reduce damage to the drainage ditches and mounds and an action to reduce the likelihood of people stealing ancient tools).
 - Think about and assign who should be responsible for each management action (for example, the local community, national government, a cultural centre, researchers and other people).
 - Share and present their management plans to the whole class.

To deconstruct this activity, you could:

- Ask the groups to explain the conservation challenges facing the heritage site. If appropriate, ask the groups to discuss different ways of dealing with the same risk or challenge.
- Ensure that the students compare, contrast and evaluate the different solutions that are presented.
- Guide the students to democratically choose the best solution or management option, explaining the reasons for their choice.
- Organise the students to evaluate the consequences of their planning choices. Ask them how they determined that one option was better than another one.
- Ask the students questions such as:
 - Why do you think it is important to have a management plan for the Kuk Early Agricultural Site?
 - How will your plan fit in with custom methods of managing land?
 - How will you ensure that everyone follows the management plan?
 - What do you think should be done if people ignore the plan and remove or destroy a heritage feature?
 - How could you manage this situation in a peaceful manner?
 - How do you plan to manage and promote your own natural and cultural heritage from today?

ACTIVITY



DISCUSSION



DISCUSSION



SITE CONSERVATION, PROTECTION AND FUTURE MANAGEMENT

HANDOUT



Local Communities Assisting with Site Protection

Today, around 200 Kawelka people live and garden at Kuk Swamp. Kawelka stories and traditions have linked them closely to the swamp for many generations. However, they cannot be sure if their connection to Kuk extends all the way back to 10,000 years ago. To the Kawelka, it doesn't matter. They are proud to be part of a living historical landscape. They want to help with the archaeological excavations and the future preservation and management of the site.

The Kawelka have voluntarily committed to managing and protecting the buried archaeological remains of mounds, drains and ditches. This means that they leave some areas free of gardening. To protect the soil, they do not use deep drainage or plant deep-rooted crops or trees.

To the Kawelka, heritage is something they are directly connected to through their land and stories. Allowing the Kawelka people to continue to live and garden at the site ensures the protection of the Kuk Early Agricultural Site.



Ru Kundil, a Kawelka leader who has been instrumental in raising community awareness of cultural heritage at Kuk

Photo: Tim Denham. Copyright © Tim Denham 1999, reproduces with permission

World Heritage Status Is Helping to Promote the Site for the Future

Dorish Apuka is the acting programme manager for culture and heritage at the Papua New Guinea National Commission for UNESCO. She describes how World Heritage listing can contribute to our future:

The Kuk Early Agricultural World Heritage Site is not just about our past – it is about our future. Our cultural and natural heritage is extremely important for future generations. Students are our future decision makers. They need to make sure that they learn about their own culture and heritage. I hope that students will choose to conserve and protect important cultural and natural heritage places for their own families to value in the future.



Dorish Apuka, acting program manager for culture and heritage, Papua New Guinea National Commission for UNESCO

Photo: Sally Asker

Managing Risks

The Kuk Early Agricultural Site is of outstanding universal value to the people of Papua New Guinea and to the rest of the world. It is important that the site is carefully managed, protected and looked after for the future. The site faces some natural risks and some human pressures that could threaten the future of its important and extremely old agricultural remains.

Natural Risks

Natural risks sometimes cause changes to heritage sites and destroy or erode heritage features. Natural risks that could affect Kuk include periods of severe drought, which could damage the soil composition, and floods.

Human Pressure

Human pressure could have more of an effect on the site than natural risks. Potential future plans for new developments near the Kuk Swamp could pose a big risk to the site by increasing human access to it. Conflict over land ownership could also create problems. Deep tillage could destroy the remains. The introduction of western concepts such as a management plan could be challenging to use alongside local oral traditions of land management.

To ensure the sustainability of this World Heritage site and its natural values, social and cultural benefits and learning aspects, we will need to manage the natural risks and human pressures. The management of the site requires proactive community relations, monitoring and ongoing discussions and cooperation between many different groups of people.

You Can Help to Promote and Conserve the Kuk Early Agricultural Site and Other Sites of Natural and Cultural Significance

You can:

- Appreciate your local natural and cultural heritage by helping to protect and promote its value.
- Talk to your elders about your cultural heritage and listen and learn from them so that you can teach your own family in the future.
- Tell others about the importance of your local natural and cultural heritage.
- Support and contribute to the work of your local community to conserve areas of importance.

If you visit a site of cultural or natural importance, be sure to respect the site and leave only footsteps. Only take away memories.

Can you think of any other actions you could take?

STUDENT ACTIVITY SHEETS

ACTIVITY



Kuk Swamp Site Management Plan

A major challenge for World Heritage conservation is balancing human pressures and other risks and threats with protecting a site for the future. Consequently, each site requires a carefully developed management plan.

In small groups, create a management plan using the following format. An example is given in the first row.

A management plan

Photo: Sally Asker

Site Features	Possible Risk/ Threat/Issue Related to the Feature	Management Action or Solution to Reduce the Risk/ Threat/Issue	Who Should Be Responsible for the Action
Drainage ditches	Building new developments at or near the site	Educate community leaders and business people so that they respect the area and won't plan to build there or accept money to allow it	Community, cultural centre and government

Site Features	Possible Risk/ Threat/Issue Related to the Feature	Management Action or Solution to Reduce the Risk/ Threat/Issue	Who Should Be Responsible for the Action

Suggested Student Activity 7

A Public-awareness Campaign

Objective:

For students to prepare posters about issues associated with the Kuk Early Agricultural World Heritage Site (or another local heritage site)

Your students could:

- Take part in a discussion about the features that make an effective poster and the tasks involved in making one.
- Divide into teams of five.
- Assign the roles within the teams (team leader, text writer, text editor, illustrator and designer) and ensure that everyone understands his or her role.
- Decide on the issue to cover in the posters.
- Make the posters.

After the activity, discuss with the students what they learned during the process and why and how they might do parts of the process differently in the future.



Posters combine words and pictures to convey a message.

Illustration: Scott Pearson. Copyright © UNESCO.

DISCUSSION



ACTIVITY



DISCUSSION



Assessment

Please refer to your ministry or department of education's guidelines on assessment as you plan your teaching for this unit. Design an assessment activity for each of the subject areas that are covered by the unit linked to the specific outcomes for each curriculum area. Write these assessment activities in the space below.

Assessment Plan

Glossary

Archaeology	The study of historical human cultures through the recovery, documentation, analysis and interpretation of material culture and environmental data, including architecture, artefacts, biofacts and landscapes
Artefact	A human-made object that gives information about the culture of its creator and users
Conservation	The protection and management of natural and cultural heritage
Cultural heritage	The heritage of cultural artefacts (such as fishing spears and pounding stones) and cultural items you can't touch (such as music and songs)
Kaukau	Sweet potato
Natural heritage	Landscapes, landforms, plants, animals and other natural features

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