Introduction

Sophisticated knowledge of the natural world is not confined to science. Human societies all across the globe have developed rich sets of experiences and explanations relating to the environments they live in. These 'other knowledge systems' are today often referred to as traditional ecological knowledge or indigenous or local knowledge. They encompass the sophisticated arrays of information, understandings and interpretations that guide human societies around the globe in their innumerable interactions with the natural milieu: in agriculture and animal husbandry; hunting, fishing and gathering; struggles against disease and injury; naming and explanation of natural phenomena; and strategies to cope with fluctuating environments.


Indigenous knowledge is the local knowledge that is unique to a culture or society. Other names for it include: 'local knowledge', 'folk knowledge', 'people's knowledge', 'traditional wisdom' or 'traditional science'. This knowledge is passed from generation to generation, usually by word of mouth and cultural rituals, and has been the basis for agriculture, food preparation, health care, education, conservation and the wide range of other activities that sustain societies in many parts of the world.

Indigenous people have a broad knowledge of how to live sustainably. However, formal education systems have disrupted the practical everyday life aspects of indigenous knowledge and ways of learning, replacing them with abstract knowledge and academic ways of learning. Today, there is a grave risk that much indigenous knowledge is being lost and, along with it, valuable knowledge about ways of living sustainably.

This module illustrates ways that indigenous knowledge may be integrated into education and thereby, bring the benefits of helping to ‘sustain’ indigenous knowledge and societies to all. It also encourages teachers and students to gain enhanced respect for local culture, its wisdom and its ethics, and provides ways of teaching and learning locally relevant knowledge and skills.
Objectives

- To appreciate indigenous perspectives on ways of living together and using resources sustainably;
- To appreciate the role of indigenous knowledge and traditional ways of learning in maintaining the sustainability of a community;
- To understand the role of 'modern' education in undermining indigenous knowledge and ways of teaching and learning; and
- To identify opportunities for integrating relevant aspects of indigenous knowledge and approaches to teaching and learning into the school curriculum.

Activities

1. The wisdom of the elders
2. Why is indigenous knowledge important?
3. Living by indigenous knowledge
4. Indigenous and formal education
5. Enhancing the curriculum through indigenous knowledge
6. Reflection

References


Internet Sites

Indigenous knowledge and practices vary greatly between countries and regions. Therefore, the activities and resources provided here need to be considered within the context of indigenous experiences in your part of the world.

Useful sources of information include:

**Center for World Indigenous Studies**

**CIRAN**
The Centre for International Research and Advisory Networks for Indigenous Knowledge and Sustainable Development.

**The Earth Council Indigenous Peoples' Project**

**Indigenous Education Worldwide**
This Internet site lists materials, contacts, links and other resources related to the:

- Ainu of Japan
- Aborigines of Australia
- First Nations of Canada
- Indigenous People of Russia
- Inuit
- Maori of New Zealand
- Native Hawaiians
- Native North Americans
- Saami of Scandinavia

**Indigenous Knowledge and Development Monitor**
A journal published by CIRAN on the role that indigenous knowledge can play in sustainable development. The Monitor is published three times a year.

**UNESCO’s (MOST) database of best practice on Indigenous Knowledge**
The Centre for International Research and Advisory Networks (CIRAN) in co-operation with UNESCO’s Management of Social Transformations Programme (MOST) jointly coordinate a database of best practice on Indigenous Knowledge. This site includes a definition of indigenous knowledge, a discussion of criteria for selecting ‘best practice’, and a registry of best practice that gives numerous detailed summaries of projects in Africa, Asia, Europe and Latin America that have sought to improve conditions and alleviate poverty through the successful employment of indigenous knowledges. The site also links to CIRAN and MOST’s joint publication entitled Best Practices on Indigenous Knowledge.
Credits

This module was written for UNESCO by John Fien using resources and activities from Rohanna Ulluwishewa, Abdul Aziz Kaloko and Dyhairuni Hj Mohammed Morican, Annette Gough, Premila Kumar and Alan R. Emery and Associates in Learning for a Sustainable Environment (UNESCO - ACEID).
Activity 1: The wisdom of the elders

Begin by opening your learning journal for this activity.

Describing the wisdom of indigenous people, the former Director General of UNESCO, Frederico Mayor, once said:

"The indigenous people of the world possess an immense knowledge of their environments, based on centuries of living close to nature. Living in and from the richness and variety of complex ecosystems, they have an understanding of the properties of plants and animals, the functioning of ecosystems and the techniques for using and managing them that is particular and often detailed. In rural communities in developing countries, locally occurring species are relied on for many - sometimes all - foods, medicines, fuel, building materials and other products. Equally, people’s knowledge and perceptions of the environment, and their relationships with it, are often important elements of cultural identity."

‘What do we mean by indigenous knowledge?’

This question was explored at a workshop in Inuvik, Canada, by a group of Inuit people who agreed on a list of six principles:

1. **Our knowledge is practical common sense, based on teachings and experience passed on from generation to generation.**
2. **Our knowledge is ‘knowing the country’; it covers knowledge of the environment and the relationship between things.**
3. **Our knowledge is holistic - it cannot be compartmentalised and cannot be separated from the people who hold it. It is rooted in the spiritual health, culture and language of the people. It is a way of life.**
4. **Our knowledge is an authority system. It sets out the rules governing the use of resources - respect; an obligation to share. It is dynamic, cumulative and stable. It is truth.**
5. **Our knowledge is a way of life - wisdom is using knowledge in good ways. It is using the heart and the head together. It comes from the spirit in order to survive.**
6. **Our knowledge gives credibility to people.**
Who are Indigenous People?

The world population of indigenous people is approximately 300 million, according to the International Labour Organisation. This includes around 5000 different groups, living in over seventy countries.

But, who are indigenous people? What characteristics do they share? It is difficult to answer this question because all indigenous groups are unique to the places where they live - and there are many different ways of defining 'indigenous people'. Here are two:

- **Definition 1** focuses on legal ideas.
- **Definition 2** focuses more on cultural ideas.

Q1: Read these two definitions and answer the following questions:

- Which definition do you prefer? Why?
- Why are 'legal' ideas in Definition 1 important?
- Which groups of people in your country could be classed as 'indigenous' according to this definition?
- Why are the 'subjective' ideas in Definition 2 important?
- Write your own working definition of 'indigenous people'.

Putting these ideas together, the United Nations has proposed the following definition:

"Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems."

Source: Cited in Global Issues for the 90s, Centre for Teaching International Relations, University of Denver, 1993, pp. 86-97.
Definition of Indigenous

All definitions of the concept of 'indigenous' regard self-identification as a fundamental criterion for determining the groups to which the term indigenous should be applied. Within the UN family, the ILO (ILO Convention 169) defines Indigenous and Tribal people as follows:

Tribal people in independent countries whose social, cultural and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations;

People in independent countries who are regarded as indigenous on account of their descent from the populations which inhabited the country, or geographical region to which the country belongs, at the time of conquest or colonisation or the establishment of present state boundaries and who irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions.

Indigenous people

Indigenous people are strikingly diverse in their culture, religion, and social and economic organisation. Yet today, as in the past, they are prey to stereotyping by the outside world. By some they are idealised as the embodiment of spiritual values; by others they are denigrated as an obstacle to economic progress. However, they are neither: they are people who cherish their own distinct cultures, are the victims of past and present-day colonialism, and are determined to survive. Some live according to their traditions; some receive welfare; others work in factories, offices or the professions. As well as their diversity, there are some shared values and experiences among indigenous cultures. Where they have maintained a close living relationship to the land, there exists a co-operative attitude of give and take, a respect for the Earth and the life it supports, and a perception that humanity is but one of many species.

This activity is based on a short essay about the benefits of respecting indigenous knowledge.

The essay was written by Maurice Strong who was a key organiser of the Earth Summit in Rio de Janeiro in 1992, and later a special advisor to the Secretary-General of the United Nations. He wrote the essay as a foreword to the book, The Gaia Atlas of First Peoples (Burger 1990).

In this activity, the essay is presented in an unedited form with the paragraphs out of sequence. Edit the essay so that the paragraphs appear in the correct order.

Maurice Strong’s essay shows that indigenous knowledge is not only important in its own right, but is also important for the benefits it brings to:

- The indigenous people who own and live it;
- All the other people around the world who can learn lessons for living sustainably from it; and
- The Earth which would be treated more carefully if indigenous knowledge and values were followed more widely.
Begin by opening your learning journal for this activity.

This activity illustrates four ways in which indigenous people in different parts of the world use their knowledge to live sustainably. Each way is illustrated by one or more case studies from different parts of the world.

- **A spiritual relationship with the land**
- **Natural remedies and medicines**
- **Sustainable resource management**
- **Sustainable social relationships**

**Principles for Living Sustainably**

The case studies you have just read reflect the principles for living sustainably explored in Module 4:

- Conservation
- Appropriate development
- Democratic participation
- Social equity and peace

Q2: Analyse the case studies in relation to these principles for sustainable living.
Interviews with Indigenous People

This task provides suggestions for investigating indigenous ways of living sustainably by talking with local indigenous people about:

- Indigenous knowledge possessed by people in your area; and
- Aspects of this knowledge they would like to see taught in schools.

You could do this on your own or with a small group of colleagues.

It is important to check and observe local protocols for inviting indigenous people to talk with you about their knowledge. There may be issues about who has the right to speak, about what, and to whom. Other issues may relate to sacred and secret knowledge. Possibly, some knowledge may only be shared with people of certain ages, or with men or women only. Learn all you can about these protocols to avoid insensitive questions.

Worksheets for four interview topics are provided below.

Check which topic local groups would be most happy to discuss with you, and/or like to see incorporated in the school curriculum.

- Health and medicines
- Sanitation
- Resource management
- Agriculture
A Spiritual Relationship With The Land

For indigenous people, the land is the source of life - a gift from the creator that nourishes, supports and teaches. Although indigenous peoples vary widely in their customs, culture, and impact on the land, all consider the Earth like a parent and revere it accordingly. 'Mother Earth' is the centre of the universe, the core of their culture, the origin of their identity as a people. She connects them with their past (as the home of ancestors), with the present (as provider of their material needs), and with the future (as the legacy they hold in trust for their children and grandchildren). In this way, indigenousness carries with it a sense of belonging to a place.

At the heart of this deep bond is a perception, an awareness, that all of life - mountains, rivers, skies, animals, plants, insects, rocks, people - are inseparably interconnected. Material and spiritual worlds are woven together in one complex web, all living things imbued with a sacred meaning. This living sense of connectedness that grounds indigenous peoples in the soil has all but disappeared among city dwellers - the cause of much modern alienation and despair.

The idea that the land can be owned, that it can belong to someone even when left unused, uncared for, or uninhabited, is foreign to indigenous peoples. In the so-called developed world,
land is in the hands of private individuals, corporate investors, or the state and can be sold at the will of the owner. For indigenous peoples land is held collectively for the community (though competition between communities, and with outsiders, for rights of use, has sometimes led to conflict). According to indigenous law, humankind can never be more than a trustee of the land, with a collective responsibility to preserve it.

The predominant Western world view is that nature must be studied, dissected, and mastered and progress measured by the ability to extract secrets and wealth from the Earth. Indigenous people do not consider the land as merely an economic resource. Their ancestral lands are literally the source of life, and their distinct ways of life are developed and defined in relationship to the environment around them. Indigenous people are people of the land. This difference has often led to misunderstandings. Many have assumed that indigenous people have no sense of territory because they do not necessarily physically demarcate their lands. However, indigenous people know the extent of their lands, and they know how the land, water, and other resources need to be shared. They understand only too well that to harm the land is to destroy ourselves, since we are part of the same organism.

Until the last few decades, the Kedayans, another rural people of Brunei, have survived by carefully utilising forest, land and wildlife for their livelihood. Through their day-to-day activities of agriculture and hunting, they utilised and extracted forest resources to produce food and manufacture materials for their consumption and tools for their survival activities, respectively. They have been practising this way of life through many generations, using a complex and highly adaptive system, such as cultivation of hill and swamp rice. To cultivate their staple food, rice, they used different agricultural techniques, both shifting and permanent, depending on the different types of padi (such as, tugal, paya, hambur, tanam) they were growing.

Well into the 20th century, the Kedayans were traditionally shifting agriculturists, felling, burning and planting hill padi in successive hillsides in succeeding years. An example of areas subjected to this method of rice cultivation is the very rural parts of Temburong, such as Kampong Piasaw-Piasaw. Today, a large part of Temburong is still covered with forest - evidence that the Kedayans have not
over-exploited or misused their forest environments. In short, it has been their harmonising and systematic methods of using their environments (particularly land and forests) that have enabled them to practice similar economic activities through many generations to produce food and manufacture materials, not only for themselves but also to sell the surplus to non-agricultural people in the country.

Natural Remedies and Medicines

In many parts of the world, indigenous societies classify soils, climate, plant and animal species and recognise their special characteristics. Indigenous people have words for plants and insects that have not yet been identified by the world’s botanists and entomologists. The Hanunoo people of the Philippines, for example, distinguish 1600 plant species in their forest, 400 more than scientists working in the same area. Of the estimated 250,000 to 500,000 plant species in the world, more than 85% are in environments that are the traditional homes of indigenous people. Nearly 75% of 121 plant-derived prescription drugs used worldwide were discovered following leads from indigenous medicine. Globally, indigenous peoples use 3000 different species of plant to control fertility alone. The Kallaywayas, wandering healers of Bolivia, make use of 600 medicinal herbs; traditional healers in Southeast Asia may employ as many as 6500 plants for drugs. Almost all trees and many plants have a place in medicinal lore.

Some scientists now believe that indigenous knowledge may help them to discover important new cures for diseases such as AIDS and cancer. Many developed countries realise the potential for indigenous medicine. It is locally available, culturally acceptable, and cheaper than imported drugs.

Case Study: Medicinal Plants in India

Indigenous people work on body and mind together to help cure illness. Medicinal plants are used to treat the spiritual origins of disease as well as the physical symptoms. The vast knowledge of such plants is now beginning to be acknowledged by the rest of the world. So is the role played by indigenous people as custodians of the world’s genetic heritage.

A botanical survey of India revealed that tribal peoples of the north-east use plant drugs to cure fevers, bronchitis, blood and skin diseases, eye infections, lung and spleen ulcers, diabetes, and high blood pressure. Knowledge of their use is passed on by the ‘vaiyas’, Indian herbal medicine doctors. In a single area of 277 sq. km (107 sq. miles) 210 types of medicinal plants have been found.

The Kameng and Lohit peoples in Arunachal Pradesh crush a bulk of Fritillaria cirrhosa to a paste to relieve muscle pains. Research has now confirmed the presence of a chemical similar to cocaine in a related Fritillaria plant that brings relief to muscular pain.

Growing evidence of plant-based contraception is available among many tribal peoples. Worldwide, over 3000 plants are employed for contraceptive use. In the Karjat tribal area of Maharashtra, near the west coast of India, a native herb taken twice a year is said to be effective.

The Karjat study concludes that traditional health practices can provide up to half of local primary health needs. Enlightened health-care workers are beginning to re-introduce traditional plant remedies where allopathic drugs have become common-place. Properly studied and recorded, this traditional knowledge could revolutionise the world of medicine.

**Sustainable Resource Management**

The industrial world is facing an ecological crisis. Yet few industrial economists would admit they could learn from indigenous people. Their economies are often called 'primitive', their technology dismissed as 'Stone Age', and most governments assume they can benefit only from salaried employment.

Yet these traditional ways of life have proved highly durable. Hunting and fishing have allowed the Inuit to survive in the Arctic; nomadic pastoralism provides a livelihood for people in the arid Sahelian region of Africa; shifting cultivation has sustained hundreds of distinct cultures in the fragile ecosystem in the Amazon and the forests of South-east Asia. Non-indigenous people have not been able to survive in these extreme conditions without destroying the balance of the ecosystem.

The key to this success is sustainability. Indigenous people today use the resources available without depleting them. They use their intimate knowledge of plants, soils, animals, climate, and seasons, not to exploit nature but to co-exist alongside it. This involves careful management, control of population, the use of small quantities but a wide diversity of plants and animals, small surpluses, and minimum wastage. Plants provide food, medicines, pesticides, poisons, building materials; animals provide meat, clothes, string, implements, oil.

Indigenous knowledge of nature has ensured the survival of many people in fragile habitats. But it is a knowledge centered not on exploitation but on the harmony of the natural world. All flora and fauna have a place in an ordered universe made up of humankind, nature, and spirits. Indigenous cultures also help to protect the natural world from destruction through religion and rituals. Animals are commonly held in respect and their numbers maintained, often through careful management. Those

**Case Study: The Karen of Thailand**

Shifting cultivation (sometimes called 'slash and burn') is a sustainable economic system that need not harm the environment. It is the most commonly practised system among indigenous people of Asia and lowland Latin America, and provides them with a high degree of economic independence and cultural integrity. Given sufficient land and low population density, it is a highly successful way of using the forest. The Karen of Thailand practise this system.

The economy of the Karen people is based almost exclusively on subsistence dry rice production. An area is cleared of trees, undergrowth is burned, rice planted and later harvested. Each year a new site is chosen and the cycle takes seven years to return to the site first cleared. The system permits regeneration of the forest and thin tropical soils, and does not expose the steep slopes to heavy rains, which would eventually wash away the soil in a fixed-field system.

Money has virtually no place in a Karen community. If a village has enough food it is prosperous. When villagers say 'we have enough rice', it means not simply that they will survive, but that they have everything they need. If, however, shifting cultivation is unable to provide for the entire needs of a village, the people grow chilli or bamboo shoots, or they may collect and sell honey or other forest produce. Nearly all the income raised is used to buy rice.
following the Buddhist religion in India, for example, have survived many droughts because they will not kill an animal or a tree. They breed cattle selectively, monitor the feeding of their camels, and live on milk, yogurt and a few cultivated crops. Many people have developed a detailed understanding of animal behaviour. Those living in tropical forests, for example, recognise that where two different ecological zones meet, the hunting is more productive. Many even grow crops or trees to attract certain animals and increase their numbers.

Sustainable Social Relationships

Social cohesion has been the key to survival for many indigenous cultures. Food gathering and hunting depend on mutual support and cooperation, and disharmony within a part of the group is dangerous to the whole. In many cultures men and women have developed complementary, if not equal, roles; political decisions are arrived at by consensus in many cultures, and other social arrangements that benefit the entire community have often been incorporated into indigenous cultural traditions.

Marriage, for example, is an integral part of the social system - political, economic, and spiritual - in many indigenous societies. For example, in Thailand, a Hmong groom must pay a high dowry but, in turn, the wife becomes a member of the husband's clan under the direct authority of the household. Marriage can also ensure political stability for the community (by regulating exchange between groups), and continuing harmony with the spirit world. For essentially religious reasons, marriage may be prohibited between a man and woman of the same kin group; in other societies it can only take place within the kin group. The notion of marriage as a relationship founded only on the bond of romantic love is

Case Study 1: Maori of Aotearoa (New Zealand)

The Maori established a system of justice with a highly developed oratory, but no codified set of laws, courts, and judges. When the British imposed their own legal system on New Zealand, the rules took no account of Maori culture.

Traditional Maori justice was based both on the material and the spiritual worlds; redress for minor offences was determined by the community, more serious ones by the elders or chiefs.

Punishment would be exacted by a transfer of goods known as utu, or satisfaction, to the injured party. Persistent theft or murder, however, was punishable by muru, or plunder, but only after

Case Study 2: Papua New Guinea

World wars have torn societies apart, but not all societies are so destroyed by conflict. Within some indigenous communities, conflict is regulated by customary law. Rather than starting a war, aggression is normally channelled into a ritualised process of war-making and long-term destruction is minimal.

In Papua New Guinea hostilities between groups are a part of the cycle of events encompassing long periods of peace and enmity. War is just one aspect of cultural life. The idea of annihilating the other group is absent; indeed, the Tsembaga and Mae Enga are known as the peoples who marry their enemies. War is a means by which the individual and
rarely, if ever, seen in traditional societies.

The nuclear family, too, is a rare concept. A complex interweaving of lineage, clan, and family connections means that most individuals are related to each other - tradition that fosters the sense of belonging to the group, and of the need to share.

Even decisions about having a child are, in some societies, controlled by laws, helping to keep the population stable. In Melanesia, children are sometimes adopted to rebalance the size of families.

The physical architecture of a village frequently reflects the social architecture of the people. In some communities, for example, among the highlanders of West Papua (Irian Jaya) the chief’s home is separated from the other houses to emphasise the social hierarchy. By contrast, the Karen of Thailand, who have a high degree of household autonomy and social equality, have no village centre and all live in similar houses.

In some respects there are similarities between traditional Maori law and that imported by the British. But the similarities ended with matters of the spirit world.

Chiefs with spiritual power could use it to conserve parts of the land for a feast. Access to the land was prohibited and violation would anger the spirits. Strangers unwittingly entering such areas would force the community to exact compensation, or even kill the intruder, in order to avoid being punished themselves by the spirits.

full and formal discussion with reference to the true, or customary principles. Other offenders might receive a beating, the withdrawal of community assistance, or, worst of all, banishment.

the group find their identity, and is largely ceremonial.

War may be precipitated by theft, poaching, or - most serious - the killing of someone else’s pig - or long-standing disputes over territory and resources may create permanent hostilities. The Big Man, the non-hereditary chief, may try to avoid war by negotiating compensation or an exchange of gifts, but he cannot impose a decision. Equally, individuals do not take justice into their own hands as an unresolved dispute entails obligations for the whole group. But even on the point of war there is always a ritual means of stepping back from open confrontation. Anger can be channelled into a ‘nothing fight’, a competition of insults and shouting; or else it may lead to a real fight, with
Respect for the spirit world was fundamental to Maori society, but fell outside the comprehension of the British legal system. Blows exchanged and sometimes even serious casualties. After a war a lengthy process of peace-making begins. Gifts, ceremonies, and marriages establish links and obligations between the parties.

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<th>ACTIVITY</th>
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<td>1. <em>Cures for Various Illnesses or Wounds</em></td>
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<td>- Resources used (e.g., herbs)</td>
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<td>2. Preventative Measures Against Insect Pests, (eg. flies, mosquitoes, cockroaches etc.)</td>
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<td>Examples of traditional practices</td>
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**INTERVIEW TOPIC 2: SANITATION**

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<td>1. Garbage Disposal</td>
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2. Personal Hygiene.

- Examples of traditional practices

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3. Purifying Water

- Examples of traditional practices
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<td>2. Preservation of Forests</td>
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<th>3. Encouragement to Plant Trees</th>
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<td>Examples of traditional practices</td>
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### INTERVIEW TOPIC 4: AGRICULTURE

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<td>2. Preservation of Seeds/Crops</td>
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<th>3. Control of Pests, Insects and Diseases</th>
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4. **Animal Care**

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Contemporary status
Begin by opening your learning journal for this activity.

Indigenous communities depend on their immediate environment to meet most of their basic needs. Therefore, they possess a deep appreciation of the environment and its underlying processes which forms the foundation for decision making in most day-to-day activities.

**Traditional Education**

Indigenous knowledge has been passed down from generation to generation through traditional education, with adults teaching practical knowledge of culture, the environment and survival through demonstrations and through a wide range of ceremonies, stories, songs, village meetings and taboos.

**Formal Education**

Formal education was introduced to many developing countries in the 19th century (often by colonial governments) to produce administrators, clerks, teachers and interpreters. This type of education was based on abstract knowledge systems - scientific knowledge - that evolved in the western industrialised world. Formal education systems had little place for indigenous knowledge or indigenous methods of education.

It was, until recently, assumed that indigenous knowledge was irrelevant, unscientific and outdated. Therefore, few attempts were made to integrate indigenous knowledge into formal education despite its potential value in solving contemporary problems. As a result, education was confined to classrooms and children separated from their culture and environment. The teacher-centered nature of formal education also separated children from parents and, consequently, parents became less able to pass on the knowledge they had inherited to their children.

**Explaining the Change**

The experience of colonialism is often seen as the beginning of the decline in importance of indigenous knowledge.
Q3: Explain some of the effects of colonialism on indigenous knowledge.

Several contemporary factors are also contributing to the decline of indigenous knowledge. Two of these are:

- **Mass/popular culture**
- **The Elders pass away**

Q4: Identify examples of ways these two factors may have led to a decline in the importance of indigenous knowledge in your country.

**Comparison between Indigenous and 'Scientific' Knowledge**

Indigenous knowledge is different from non-indigenous knowledge, or 'scientific' knowledge, that most of us are familiar with. However, indigenous knowledge is still scientific.

Read [Traditional Knowledge Is Science](#).

Read the conclusion about the **importance of indigenous science** from the 1999 [UNESCO World Conference on Science: Science for the 21st Century](#).

A table in your learning journal identifies some differences between education systems based on indigenous and non-indigenous knowledge. It may not be feasible to totally reorient formal education to an indigenous system, however, there may be some lessons that can be learnt.

<table>
<thead>
<tr>
<th>Aspects of Education</th>
<th>Indigenous Education</th>
<th>Formal Education</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>View of Knowledge</strong></td>
<td>Sacred and secular together; includes the spiritual</td>
<td>Secular only; often excludes the spiritual</td>
</tr>
<tr>
<td></td>
<td>Holistic and integrated - based on a whole systems view of knowledge</td>
<td>Analytical or reductionist - based on sub-sets of the whole</td>
</tr>
<tr>
<td></td>
<td>Stored orally and in cultural practices</td>
<td>Stored in books and computers</td>
</tr>
<tr>
<td></td>
<td>Powerful predictability in local areas (ecological validity)</td>
<td>Powerful predictability in natural principles (rational validity)</td>
</tr>
<tr>
<td></td>
<td>Weak in local use of knowledge</td>
<td></td>
</tr>
<tr>
<td>Objectives</td>
<td>Methods of Teaching and Learning</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Less valued in distant areas</td>
<td>Lengthy period of acquisition</td>
<td></td>
</tr>
<tr>
<td>Long-term wisdom</td>
<td>Learning through experience</td>
<td></td>
</tr>
<tr>
<td>Cultural and ecological sustainability</td>
<td>Teaching through example, modelling, ritual and storytelling</td>
<td></td>
</tr>
<tr>
<td>Practical; for use in everyday life</td>
<td>Tested in practical life situations</td>
<td></td>
</tr>
<tr>
<td>Integration of critical thinking and cultural values in decision making</td>
<td><em>Rapid acquisition</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Learning by formal education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching through abstract concepts and didactic methods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tested artificially in examinations</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Short term recall</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Economic sustainability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abstract; to pass examinations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use of logical and critical thinking in making decisions</td>
<td></td>
</tr>
</tbody>
</table>

Q5: Identify some practical ways in which education today could be reoriented towards promoting a sustainable future by learning from indigenous education.
**Mass/Popular Culture**

The communication of traditional knowledge is hampered today by competition from European-derived cultures that captures the imagination of the young. They are bombarded by technology that teaches them non-indigenous ways, and limits the capacity of the elders to pass on traditional knowledge to the young.

**The Elders pass away**

As the elders die, the full richness of tradition is diminished; some of it has not been passed on and so is lost. There is a danger that the knowledge will die with them because young people do not always follow traditional ways.

Today there is a growing recognition of the value of indigenous knowledge for sustainable development. It would, therefore, be wise to sustain indigenous knowledge in traditional communities and integrate it into the school curriculum where culturally and educationally appropriate.

Five ways indigenous knowledge could help enhance the curriculum include:

- Learning attitudes and values for a sustainable future
- Learning through culture
- Learning across generations
- Starting locally: from the 'known' to the 'unknown'
- Learning outside the classroom

**Learning Attitudes and Values for a Sustainable Future**

Indigenous communities have lived in harmony with the environment and have utilised resources without impairing nature’s capacity to regenerate them. Their ways of living were sustainable. Indigenous knowledge shaped their values and attitudes towards environment, and it is these attitudes and values, which have guided their actions and made them sustainable. Therefore, indigenous knowledge can help to develop sensitive and caring values and attitudes and, thereby, promote a vision of a sustainable future.

**Learning Through Culture**

Indigenous knowledge is stored in culture in various forms, such as traditions, customs, folk stories, folk songs, folk dramas, legends, proverbs, myths, etc. Use of these cultural items as resources in schools can be very effective in bringing indigenous knowledge alive for the students. It would allow them to conceptualise places and issues not only in the local area but also beyond their immediate experience. Students will already be familiar with some aspects of indigenous culture and, therefore, may find it interesting to learn more about it through these cultural forms. It would also enable active participation as teachers could involve students in collecting folk stories, folk songs, legends, proverbs, etc., that are retold in their community.
In view of its potential value for sustainable development, it is necessary to preserve indigenous knowledge for the benefit of future generations. Perhaps the best way to preserve indigenous knowledge would be the integration of indigenous knowledge into the school curriculum. This would encourage students to learn from their parents, grandparents and other adults in the community, and to appreciate and respect their knowledge. Such a relationship between young and older generations could help to mitigate the generation gap and help develop intergenerational harmony. Indigenous people, for the first time perhaps, would also get an opportunity to participate in curriculum development. The integration of indigenous knowledge into school curriculum would thus enable schools to act as agencies for transferring the culture of the society from one generation to the next.

The philosophy of 'from the known to the unknown' should be adopted if education is to be effective. Therefore, it is wise to start with the knowledge about the local area which students are familiar with, and then gradually move to the knowledge about regional, national and global environments. Indigenous knowledge can play a significant role in education about the local area. In most societies, indigenous people have developed enormous volumes of knowledge over the centuries by directly interacting with the environment: knowledge about the soil, climate, water, forest, wildlife, minerals etc. in the locality. This ready-made knowledge system could easily be used in education if appropriate measures are taken to tap the indigenous knowledge, which remains in the memory of local elderly people.

Students can learn much from fieldwork in the local area. This calls for some prior knowledge and understanding. For instance, to be able to understand the relationship between indigenous people, soils and plants, students need to identify the plants and soil types in the local area. One way to get a preliminary knowledge of plants and soil types in the local environment is to consult indigenous people and invite them to teach your students in the field.

Indigenous people may also be willing to show students collections of artifacts and certain ceremonies and explain their significance and, where appropriate, share with them particular sites of special significance.

Explore ways in which science education can be enhanced through integrating indigenous knowledge into classroom teaching.

Read a case study of an approach to indigenous education among the Eeyou (Cree Indian) people of Canada.
Educating Today’s Youth in Indigenous Ecological Knowledge: New Paths for Traditional Ways

Robbie Mathew
Eeyou (Cree Indian) Elder of Chisasibi Nation, Canada

I am an elder from an indigenous nation of subarctic Canada, the Eeyou or Cree Indians of the James Bay region. One of our great concerns is what the future will hold for our children and youth. As for many indigenous peoples around the world, our territories and our ways-of-life are undergoing processes of change and renewal. For the Eeyou, education and the transmission of knowledge is a critical issue but a complex one. On the one hand, we understand education in non-indigenous ways may allow our children to live well in a world different from the one we grew up in. At the same time, we also profoundly believe that Eeyou youth must sustain their indigenous knowledge and ways, as it only by knowing from where they come that they will be able to determine to where they wish to go.

But passing on traditional Eeyou knowledge in today’s world is not an easy task. There are many barriers to overcome. In the past, Eeyou children of the Chisasibi community were born out on the land. Today the children are born in hospitals and grow up in the town. They are educated differently than their forefathers, receiving formal schooling, and they do not have the connection with the land that past generations had.

Even many parents today find it difficult to pass on Eeyou culture and traditions to their children, for when they were young they were subjected to government programmes of assimilation through residential schools. The residential schools cut the ties between children and their parents and grandparents, by retaining the children in the school and in the community during their formative years. They were not allowed to stay with their families for more than six weeks each year. From the late 1940s to the mid 1970s, Eeyou culture and language were forbidden in the schools. This period of residential schools created a gap in the transmission of Eeyou culture and knowledge.

Since the 1970s, my community has also suffered greatly from major changes brought on by large-scale industrial development on our traditional hunting territories. For example, from the 1970s onwards, the Cree Nations of east James Bay, and in particular that of Chisasibi, have been confronted with major environmental and social transformations due to the construction of a series of hydroelectric megaprojects. For any society, rapid environmental and social change is disorienting and potentially destructive. In my own community of Chisasibi, the human toll has been high, and children and youth have suffered greatly: family violence, juvenile delinquency, alcohol and drug abuse, depression and suicide. This is the disturbing legacy for our youth.

For these young people who have dropped out of school and turned their backs to society, Eeyou elders, along with our Cree Hunters and Trappers Association,
have set into place a kind of 'bush school'. Young boys and girls, often from families who have not been able to offer necessary guidance and support, are taken out to traditional hunting and trapping territories by an elder hunter and his wife. There, away from town life, they learn to live according to another rhythm and set of values. Through a process of apprenticeship, they begin to appreciate the knowledge that has been passed down to the elders, knowledge that is based on thousands of years of intimate experiences and interaction with the land, the waters, the animals, the plant life and the skies of the subarctic region.

This traditional knowledge cannot be taught in the classroom. For many years now, the Cree School Board has included culture courses in its formal school curriculum. Children are exposed to Eeyou culture through the making of traditional objects such as moccasins, sleds and snow shoes, and through lectures on their use. But in my opinion, young people cannot be taught how to hunt, how to trap, and how to survive on the land, through lectures and diagrams.

To pass on traditional knowledge, there is no better classroom than the bush. Young people, who have been taught Cree culture in school, often come to me and plea to be taken out in the bush. Our innovative 'bush schools' are somewhat of a hybrid between traditional learning and formal education. With a curriculum specially adapted to bush life, they offer an apprenticeship which includes both hunting and fishing knowledge and Eeyou spirituality. The bush school enables Eeyou youth to better understand their heritage by getting them out onto the land and allowing them to discover for themselves what Eeyou culture is and what it means to them as individuals.

Many youth that are sent to the bush schools are not just regular students. They are the ones who are deemed to be misfits or lost. They are labeled incorrigible; they abuse alcohol and drugs, and personal relationships are strained to the limit, including those with their immediate families. They have been rejected by the schools and by the community. Of course, these young people cannot be just taken out on the land and immediately taught traditional knowledge, for often this is one of the things that they are rejecting. The habitual dynamic of teacher-student must be replaced by another relationship.

Out on the land, young people are given a fresh start. Their past problems or crimes are not mentioned so as not to embarrass them. They are received like a member of the family, and the teaching and learning process evolves quickly in an atmosphere of caring and sharing. I have to get to know them, know how their minds work, learn how their feelings and emotions help or prevent them from learning or accepting themselves. Everyone is included in the teaching and learning process, for the Eeyou believe that even children have something to teach or share with elders. In many instances, I become the student and they the teachers.

I will start out teaching them about respect, not just for the land and others, but also for themselves. They must learn to be proud of themselves. The knowledge of the Eeyou Nation is based on a solid foundation of respect. We
believe that humans are not separate from anything, not from the land, not from the animals, not from the seas and the skies, and certainly not from each other. We are all one family, children of the Creator, even if we live, pray, and understand in different ways. We are linked by common dreams of peace, compassion, harmony, truth, integrity, wisdom, knowledge, and, most of all, love. Traditional Eeyou knowledge teaches that the Creator made all humans equal, and it was not in the Creator's plan that one colour of man should oppress another, whether through slavery, economic, or any other form of domination. Traditional teaching extends this belief to the animal kingdom. For example, it is believed that humans were not put on this Earth to destroy the land or the animals but to protect and ensure their survival for future generations.

I use several different methods to pass on knowledge to the young people when we are out on the land. One method which has been used for countless generations is legend and storytelling. The youth will ask questions about the meaning of the legend and I will tell them the meaning so that they may understand for themselves what is meant by Eeyou culture.

Another way of passing on traditional knowledge is to take the youth out on the land and to familiarise them with the landscape. When young people come into the camp, they must be taught how to talk about the land. They learn new words in their own language so that they can describe the shape of the lake, a line of trees crossing a landscape, or a passage between hills. In town, part of the Eeyou vocabulary is lost because it is no longer used or applicable and English words infiltrate Eeyou vocabulary. For example, the vocabulary used inland differs from the vocabulary used on the coast (the village of Chisasibi is located on the coast). For example, they must know that the word for bay on a lake yadowaganee is different from the word for a bay on the ocean, awasach. The same distinction is made for a point of land. If it is along the sea coast, it is called amid stawayach, but on a lake it is named minawadem.

The young people must learn this special vocabulary in order to understand when an Elder gives directions. They are taught how to get to and recognise places, even though they have never seen them before. Once they have developed their survival capacities, they are sent out to navigate the land on their own. In this way, they learn about the land, the words they need, the basic skills to survive ... by actively doing and learning through doing.

The youth are taught how to live off the land, how to choose the right kind of fire wood, how to set up camp if they are caught outside for a night and so on. They stay with me and my wife in our tepee and learn how to take care of themselves. The girls learn how to clean a tepee and how to keep the tepee stocked with water and how to handle an axe for chopping firewood. The girls will also learn how to skin and clean different animals. My wife will also teach the young girls how to look after themselves and their bodies. The boys will learn the different traditional techniques for hunting such as how to set a rabbit-snares. First they are shown how and then they must act on their own.

These traditional methods of teaching and the long stay out in the bush seem to
have an effect on the Eeyou youth. Sometimes a parent will call me to ask what happened out on the land. They will comment that their child now enjoys sharing the workload or that he or she has begun to enjoy different activities. While the programme in the bush lasts only for a period of three to four months, I keep contact with the child afterwards. Often I will check up on an individual at school and the news is mostly good. The child has a renewed interest in learning.

In the changing world in which we live today; one knowledge system should not be favoured over another. It is essential for traditional knowledge to be passed on, but it is wrong to think that this transmission can be done in the same way as scientific knowledge. Our youth require both scientific knowledge from outside, as well as their own traditional knowledge. But each of these sets of knowledge are passed on in different ways and have their own places for teaching. Formal education can happen in the classroom, but traditional knowledge must be passed on to our youth out on the land where our people have always hunted, fished and trapped. To ensure the continuing survival of our traditional knowledge, we must develop pathways which are parallel and complementary to formal education.

Begin by opening your learning journal for this activity.

**Completing the module:** Look back through the activities and tasks to check that you have done them all and to change any that you think you can improve now that you have come to the end of the module.

Q6: List three syllabus topics you teach into which you could integrate the study of indigenous knowledge-culture, values and practices.

Q7: List some key guidelines for cultural sensitivity and the teaching methods you would need to follow.

Q8: List any possible barriers to integrating indigenous knowledge and following these guidelines in your teaching. How might these barriers be overcome? Who can assist you to achieve this?
Activity 1 - The wisdom of the elders

Q1: Having read the two definitions of 'indigenous people', answer the following questions.

Which definition do you prefer? Why?

Why are 'legal' ideas in Definition 1 important?

Which groups of people in your country could be classed as "indigenous" according to this definition?

Why are the "subjective" ideas in Definition 2 important?

Write your own working definition of "indigenous people".

Activity 3 - Living by indigenous knowledge

The following table identifies principles for living sustainably. The final questions in this task asks you to write a brief definition of each of these principles. It will be useful to be thinking about this as you complete the table.
Q2: Complete the table for each principle. Parts of Principle 1 have been completed as an example.

<table>
<thead>
<tr>
<th>Principles</th>
<th>Practical Examples</th>
<th>Brief Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name the case study that best illustrates this principle in action</td>
<td>Give examples of what the people in the case study do to practise this principle.</td>
<td>Write a brief definition of each principle in your own words</td>
</tr>
<tr>
<td><strong>1. Conservation</strong></td>
<td></td>
<td>Conservation means the wise use of natural resources; using only the resources you need and ensuring more will be than for other people in this and later generations.</td>
</tr>
<tr>
<td><strong>Case Study:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Penan and Kedayan People of Brunei</td>
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<td></td>
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<tr>
<td>The Karen of Thailand</td>
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<td></td>
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<tr>
<td><strong>2. Appropriate Development</strong></td>
<td></td>
<td>Appropriate development means:</td>
</tr>
<tr>
<td><strong>Case Study:</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>3. Democratic Participation</strong></td>
<td></td>
<td>Democratic participation means:</td>
</tr>
<tr>
<td><strong>Case Study:</strong></td>
<td></td>
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<tr>
<td><strong>4. Social Equity &amp; Peace</strong></td>
<td></td>
<td>Social equity &amp; peace means:</td>
</tr>
<tr>
<td><strong>Case Study:</strong></td>
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</tbody>
</table>

Activity 4: Indigenous and formal education

Q3: Explain some of the effects of colonialism on indigenous knowledge?
Q4: Identify examples of ways these two factors may have led to a decline in the importance of indigenous knowledge in your country.

1. Mass/Popular Culture

2. The Elders pass away

Q5: Identify some practical ways in which education today could be reoriented towards promoting a sustainable future by learning from indigenous education.

Activity 6 - Reflection

Q6: List three syllabus topics you teach into which you could integrate the study of indigenous knowledge—culture, values and practices.

1. 

2. 

3. 

Q7: List some key guidelines for cultural sensitivity and teaching methods you would need to follow.

Q8: List any possible barriers to integrating indigenous knowledge and following these...
guidelines in your teaching. How might these barriers be overcome? Who can assist you to achieve this?

<table>
<thead>
<tr>
<th>Possible Barriers</th>
<th>How to Overcome</th>
<th>Source of Assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
<td></td>
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<tr>
<td>3.</td>
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</tbody>
</table>