

Kanan K'ak'náab Ma' Su'up'il

Ku taasik te'ex



LE CHUKTE'OBO'

Primary School Edition-Ti'al primaria najil xooko'ob

Maya [yua] Edition for Belize

Aj Ts'iib
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Ajsut ts'iib ti' Miatsil
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TO'ONE' AJKANAN K'AK'NÁABO'ON MA' SU'UP'IL.

¡BEYXAN TE'EX!

Le ka'at'aanil nu'ukulixoko'oba' jo'osa'abo'ob tumen

Kanan K'ak'náab Ma'su'up'il www.marinefrontiers.org

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Wa a k'áat ka yanak jump'éeel le áanalte'ob ichil a na'tsil t'aane', much a'al ti' to'on yo'osal k múul meyaj ti'al ka béeyak. ¡Tuláakal le kajtalilo'ob yéetel le t'aano'ob k'aambe'eno'ob waye'!



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If you would like to have one of these books in your mother tongue, contact us and we will try to work with you to make this happen. All peoples and all languages are welcome here!



Alvaro Andrés Moreno Munare' (ti' Asociación de Pescadores del Caribe Pez León) táan u máansik Robby Thigpen (Ti Kanan K'ak'náab ma' Su'up'il) ichil le canales de comunicación yaan te' chukte' Rhizophora Mangle ku p'áatal ichil ciénega La Virgen yéetel Caribe colombiano tu nojkaajil Cartagena de Indias.

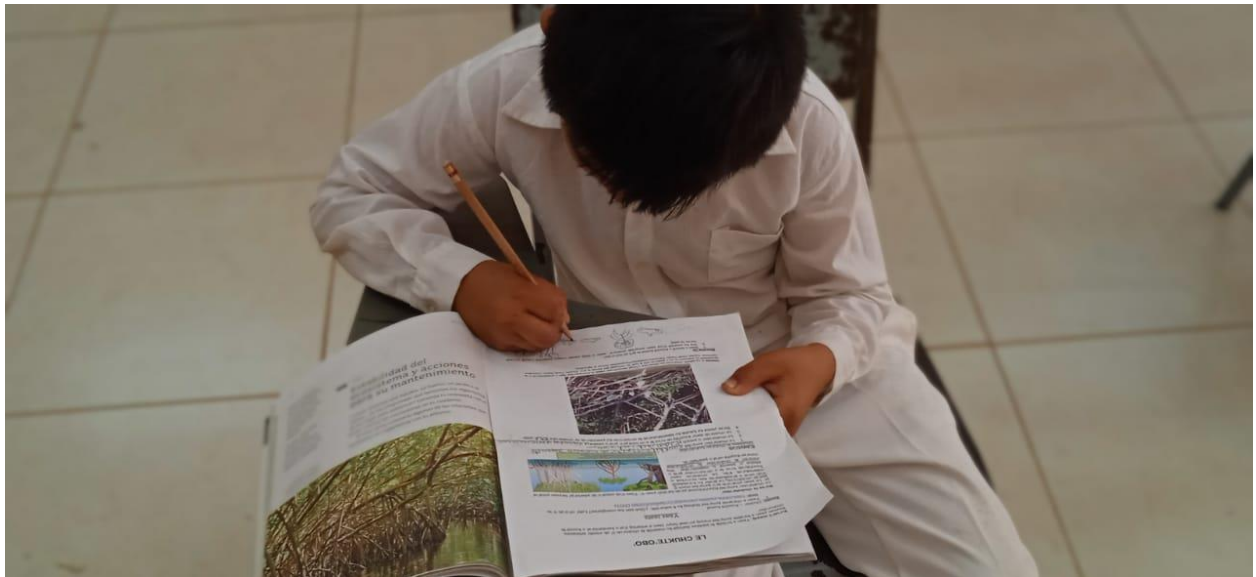


Alvaro Andrés Moreno Munar of the Asociación de Pescadores del Caribe Pez León is giving a tour to Robby Thigpen of Marine Conservation Without Borders in the Rhizophora Mangle mangrove creeks between the ciénega de La Virgen y el Caribe colombiano en la ciudad de Cartagena de Indias.

Jareth Josue Medina Perez juntúul xoknáal ti' 4^o ti' primaria najil xook "Andrés Quintana Roo" tu kaajil La esperanza, Quintana Roo, México. Tu yotoch yéetel ken jo'op u báaxal yéetel u etailo'obe' ku t'anik maaya [yua], ba'ale' tuláakal u áanalte'obe' ts'íibta'ano'ob ich español. Je'exbix tuláakal paale', leti'e' ku k'amik ka'ap'éeel xookil. Yaan jump'éeel xookil ku k'amik ichnaj líik'ul ken síjik. Ken ts'o'okoke' ku taal le xookil ku k'amik tu najil xook. Le ka'ap'éeel xookilo'oba' ku k'amik ichil jejeláas t'aano'ob. Lela' ku yúuchul ti' tuláakal le máasewal kajtalilo'obo', le najil xooko'obo' mixtan u jach oksaj óoltiko'ob le kaambal ku taasiko'ob le mejen paalalo'ob ichnajo'.

Ts'o'ok k ba'alitik jump'éeel túumben plan de estudios yo'osal biología ti'al le máasewal kajtalilo'obo'. be'elajake' *Josue* táan u kanik yo'osal chukte'ob ti' jump'éeel áanalte' ts'íibta'an ich maaya. Leti'e' kex ku t'anik maayae' mixtan u xokik mix u ts'íibtik. Be'elajake' leti'e' táan u kanik ba'axo'ob yaan tu báak'paach ikil u kanik u xok yéetel u ts'íibt le maayao'. Be'elajake' le ka'ap'éeel xookilo'obo' (ichnaj yéetel najilxook) ts'o'ok u much'ikuba'ob yo'osal beyo' u mu'uk'antal u tuukul.

¡*Josue* Kanan k'ak'náab ma' Su'up'il, teche' je'el xan u páajtal a táakpajale'!



Jareth Josue Medina Perez is a 4th grade student at the *Andrés Quintana Roo Indigenous Primary School* in *La Esperanza, Quintana Roo, México*. In his home and when playing with his friends he speaks Maya [yua], but all of his textbooks are in Spanish. Just like everyone he receives two types of education. There is the education he receives at home that began when he was born. Then there is the education he receives at school. These education systems are in different languages. It is the same in most Indigenous communities and the education at school oftentimes denigrates the education received at home.

We have developed a novel biology curriculum for linguistically diverse education systems and today *Josue* is learning about the Mangroves in a text book written in Maya for him. He has never learned to read and write in Maya. Now he is learning more about the world around him while learning to read and write in his mother tongue. Today his two education systems have been brought together to make these linguistically diverse education systems a place of greater opportunity.

¡*Josue* is Marine Conservation without Borders and you are too!



TO'ONE' AJKANAN K'AK'NÁABO'ON MA' SU'UP'IL.
¡BEYXAN TE'EX!

Le jaatsil je'ela yo'osal "Chukte'ob" ti' u taal ti' *U Tsooyilo'ob Caribe* ts'íibta'an tumen Kanan K'ak'náab ma' Su'up'il. Ba'alíita'abij ikil u cha'abal jaatsilo'ob ti' k yáax plan de estudios STEM biocultural prototipo. Rooby Thigpen, ku meyaj ti' MCB yéetel Sayab Miats, leti' u yáax ajts'íibil, ba'ale' asab chukpajij yéetel u noj áantaj k etmeyajilo'ob Grazzia Maria Matamoros Erazo yéetel José A. Romero Durón.



Sayab Miats

Le oochelo'obo' j-ts'áabo'ob tumen Robby Thigpen ti' MCB yéetel Alvaro Andrés Moreno Munar ku meyaj ti' *Asociación de Pescadores del Caribe Pez León (ASOPCAPEL)*. Beyxan tumen Lisa Mulchay ku meyaj ti' *Reef Keepers, Belize*, Ivany Argueta ku meyaj ti' *Refugio de Vida Silvestre Cuero y Salado* yéetel Antonio Busiello.



Le STEM curriculum biocultural yo'osal Chukte'obo' ts'íibta'ab yéetel sutts'íibta'ab ich maaya tumen Robby Thigpen yéetel Hilario Poot Cahun ku meyaj o'ob ti' Kanan K'ak'náab ma' Su'up'il yéetel Sayab Miats AC.



Le STEM curriculum bioculturala' yaan u yoksa'al ichil le áanalte' ku k'aba'atik *U Tsooyilo'ob Yucatán*. Lela' ts'íibta'ab ti'al xoknáalo'ob ti' primaria máasewal najil xooko'ob tu lu'umil Quintana Roo.



Yéetel u yáantaj le *Institute of Environment* ku taal ti' *Florida International University*, le STEM plan de estudios bioculturala' yaan u ka'ansa'alo'ob tumen xoknáalo'ob ti' *Universidad Intercultural Maya de Quintana Roo*.



WE ARE MARINE CONSERVATION WITHOUT BORDERS
YOU ARE TOO!

This Mangrove chapter is from the Marine Conservation without Borders *Treasures of the Caribbean Collection*. It was created using content from our prototype biocultural STEM curricula. Robby Thigpen of MCB and *Sayab Miats* is the principle author and developer, but the full content would not have been possible without the assistance and encouragement of our dear friends Grazzia Maria Matamoros Erazo and José A. Romero Durón.



Sayab Miats

Images provided by Robby Thigpen and Alvaro Andrés Moreno Munar of MCB, Lisa Mulchay of Reef Keepers, Belize, Ivany Argueta of *Refugio de Vida Silvestre Cuero y Salado* and Antonio Busiello.



The *Mangroves* biocultural STEM curricula was developed, edited, and ethnotranslated into Maya [yua] by Robby Thigpen and Hilario Poot Cahun of Marine Conservation without Borders and the *Sayab Miats* AC.



This biocultural STEM curriculum will be included in a textbook titled *Treasures of the Yucatán* and was developed for Indigenous primary schools in Maya communities in Quintana Roo for the *Departamento de Educación Indígena de la Secretaría de Educación de Quintana Roo*.



In collaboration with Florida International University's Institute of the Environment, these biocultural STEM curricula will be tested and validated by Maya undergraduate students from *de la Universidad Intercultural Maya de Quintana Roo*.

LE CHUKTE'OBO'

Xu'uk'il meyaj: Yaan a ts'íibtik le jejeláas áantajil ku meentik le chukte'ob ti' ak *medio ambiente*. Beyxan yaan a ba'alitik jump'éeel meyaj yo'osal beyo' táan a wáantaj ti'al u kanáanta'al u kuxtal le chukte'obo'

Yáax jaats

Xookil: Chukte' – Kúuchil kuxtal

1. Yaan a cha'antik jump'éeel táabsaj ku k'aaba'atik: ¿Qué son los manglares? Lela' ch'a'ab ti' le léejil: <https://www.youtube.com/watch?v=lqqDuUFGNe0> (2021).

Ba'ax le chukete'obo'

Le chukte'obo' jump'éeel kúuchil kuxtal ya'ab ba'alob yaan ti'. Yaan ti'ob xexet'o'ob yáanal ja' beyxan yóok'ol ja'. Le yaan yóok'ol le ja'o' jump'éeel otoch ti' jáal ja' ch'íich'o'ob. Le je'ela' ku k'a'abéetal ti'ob uti'al u je'esikuba'ob ken ts'o'o'kok u máansiko'ob k'iin. Le chukte'ob xano' kúuchilo'ob tu'ux le u ch'íich'o'oba' je'el u páajtal u yaantal u mejenilo'obe'. Wa mina'an le chukte'obo' le ch'íich'o'oba' mina'an kúuchil uti'al u yaantalo'ob.



Fuente: https://stock.adobe.com/mx/images/drawing-of-three-different-types-of-mangrove-with-underwater-roots-with-fish-crabs-and-a-white-heron-in-the-scene-vector-image/291601094?prev_url=detail

K'áatchi'ob

Chukbées le chuka'an tuukulo'oba'

1. Le chukte'obo' jump'éeel _____
2. Le chukte'obo' u yotoch _____
3. Le chukte'ob xano' kúuchilo'ob tu'ux le u ch'íichil ja'e' je'el u páajtal _____
4. Ba'ax yéetel ka tukultik ku tséentikuba'ob le ch'íich'o'ob ku yaantalo'ob te' chukte'obo' _____



Oochel 1. Man-o-War Cayee' ku p'áatal naats' ti' Dangriga, Belice. Lela' jump'éeel kúuchil tu'ux ku je'ob yéetel ku tséeno'o ya'abkach ch'íich'o'ob. Le kúuchila' ku p'áatal ichil Reserva Marina South Water Caye, jump'éeel kúuchil ti' le ya'abo'ob oka'ano'ob ichil le Reservas del Arrecife de Barrera de Belice, jump'éeel kúuchil p'áatal bey Patrimonio Mundial ti' UNESCO. Le cayoa' jump'éeel kúuchil tu'ux ku kajtal kex kanp'éeel jejeláas ch'íicho'ob: fragata magnífica (*Fregata magnificens*), piquero pardo (*Sula leucogaster*), cormorán de doble cresta (*Phalacrocorax auritus*) yéetel pelicano pardo (*Pelecanus occidentalis*). Man-o-War Cayee' jump'éeel ichil le asab ka'anal isla'ob te' kúuchilo', ba'ale' ts'o'ok u bin u báanal, ts'o'ok u mina'antal kex 50%. Le je'ela' tumen yo'osal le chak ik'alo'obo' beyxan tumen u ka'anatal le ja'o' yo'osal le k'exlabankil k'iino'. Tu'ux ku p'áatal: Man-o-War Caye, Belice. Oochel tumen: Lisa Mulcahy

Meyajts'íib

1. Beet u boonil u kúuchil kuxtal le ja'il ch'íich'o'obo'.
2. Wa ka yaantal tu'ux yaan jump'éeel chukte'e', xeen a wilej yéetel meent jump'éeel meyaj yo'osal ba'ax ta wilaj.

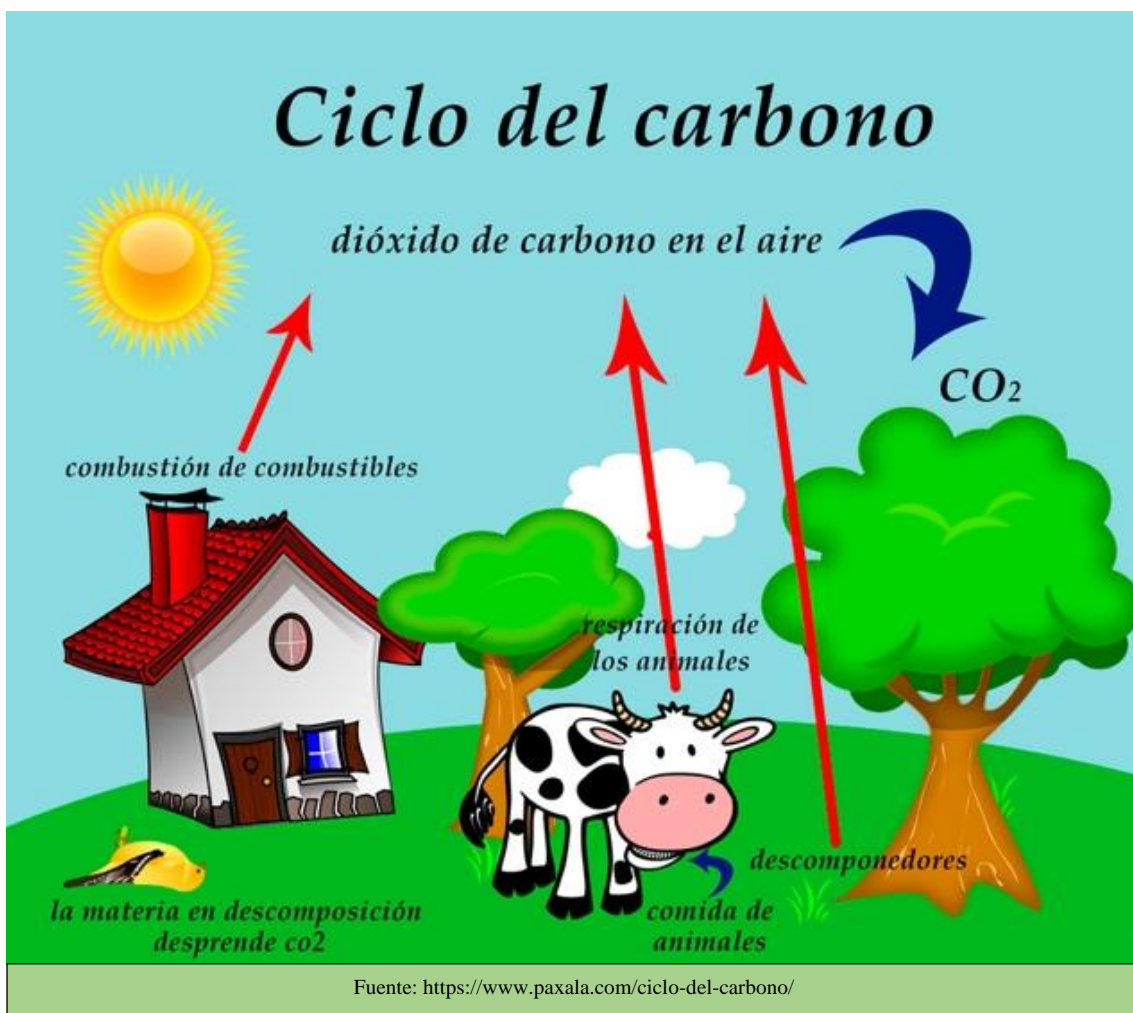
Ka'a jaats

Xookil: Le chukte'obo' ku yáantajo'ob ti'al u jáawal u chokotal yóok'ol kaab

Bix u yáantaj le chukte'obo'

Le chukte'obo' ku jáapiko'ob *dióxido de carbono* (CO_2) yéetel ku jo'osiko'ob *oxígeno* (O). Jump'éeel le nojtalamilo'ob te' k'iina' leti' u jach chokotal tuláakal yóok'ol kaab, le je'ela' táan u meentik u k'áajtal u ja'il le k'ak'náabo'obo'. Jump'éeel ichil le ba'axo'ob meentik le talamila' leti' le CO_2 , le je'ela' ku taal ti' u tóoka'al *combustibles fósiles*, je'exbix le ku taalo'ob ti' *petróleo* yéetel ti' chúuk. K'a'abéet u jáawal k meyaj yéetel le je'elo'oba', k'a'abét u káajal k meyaj yéetel ba'alo'ob ku taalo'ob ti' jeltúumben óolo'ob. Kex ka ik p'at k meentik le ba'ax je'el sáamala' láayli' ya'ab CO_2 kun p'áatal te' ka'ano'. Jump'éeel tun u meyaj le chukte'obo' yéetel uláak' pak'áalo'obe' leti' u jáapiko'ob le CO_2 yéetel u ts'áiko'ob *oxígeno*. Le chukte'obo' ku jo'osiko'ob le chúuk ti' le iik' kak ch'a'ik'tiko' tumen ku k'a'abéetal ti' leti'ob ti'al u ch'a'iko'ob óol. Leti'obe' jach u meyajob lelo'. Le je'ela' leti' jump'éeel u ba'axten k'a'abéet k kanántik le chukte'obo'.

Ba'ax le dióxido de carbono yéetel oxígeno



Meent le meyajá'

1. Kaxáant le t'aano'ob ichil le xa'ak'tbil woojo'obo'.

OXIGENO DIÓXIDO DE CARBONO CHUKTE' CHÚUK NOJTALAMIL
CHOKOTAL PETRÓLEO KA'AN

W	P	T	S	N	O	J	T	A	L	A	M	I	L	L	U	D	R	P	
A	P	K	A	N	B	D	I	O	X	A	M	A	R	G	P	K	N	O	
K	E	Á	É	P	I	I	B	U	B	T	O	U	A	F	K	Á	O	T	
A	T	A	R	C	X	E	M	C	H	I	'	C	L	A	O	A	A	O	R
X	R	B	G	H	I	L	O	L	O	L	H	K	I	C	S	M	L	O	
C	O	E	J	S	D	X	E	B	O	C	A	C	A	'	O	H	A	L	
H	L	S	H	L	O	X	I	G	E	N	O	V	T	R	Z	C	U	E	
A	E	Á	R	B	O	L	R	O	J	O	C	G	A	T	O	H	T	R	
A	'	O	S	O	F	H	K	I	C	H	L	H	S	I	'	M	U	O	O
A	L	Ñ	W	R	E	A	'	H	T	D	M	O	C	H	Ú	U	K	P	C
K	K	G	H	A	H	A	P	'	E	E	K	K	Q	A	Z	Ñ	T	E	H
S	A	M	O	R	R	N	F	O	C	O	Á	T	C	L	E	'	R	U	
A	E	A	E	'	I	J	M	E	F	X	D	T	D	A	H	L	O	R	L
C	R	M	S	T	L	S	A	P	O	S	A	B	R	A	'	I	J	O	P
T	F	Á	I	M	E	G	I	X	O	U	L	U	K	'	I	K	P	C	
I	D	I	O	X	I	D	O	D	E	C	A	R	B	O	N	O	A	L	
A	F	X	O	P	I	T	R	O	L	D	E	S	B	V	U	A	I		

Meyajts'íib

1. Cha'ant le táabsaj oochel ku k'aaba'atik: "La Importancia de los Manglares para el Cambio Climático" ch'a'an ti' le léejil: <https://www.youtube.com/watch?v=FfQgg8RwPcQ> (2021). Ken ts'o'okoke' ka núukik le k'áatchi'oba'.
- a) Bix u lúbul le ya'ab dióxido de carbono ti' le mejen chukteo'obo' yéetel u wóolkabilo'.
- b)
- c) Bix je'el u béeytal k kaláantik le chukteo'obo'.
-

Chukte'ob ti' uláak' nojlu'umilo'ob

Oochel 2. Le chukteo'ob je'elo'oba naats' ti Cartagena de india, Colombia, ma' chen ku ts'áik tu'ux u yaantal le ajchuk kayo'obo' yéetel u ts'áik jump'éeel ma'alob kúuchil ti'al u yaantal ik'elo'ob ku k'a'abéetel ti' letio'ob ti'al u kuxtalo'obi'. Ku tselik xan tuláakal le xixelchúuk ku p'atiko'ob le kisbuuts'o'obo'. Oochel: Robby Thigpen.



Óox jaats

Xookil: Chukte'obo yéetel báak'pachkuxtal

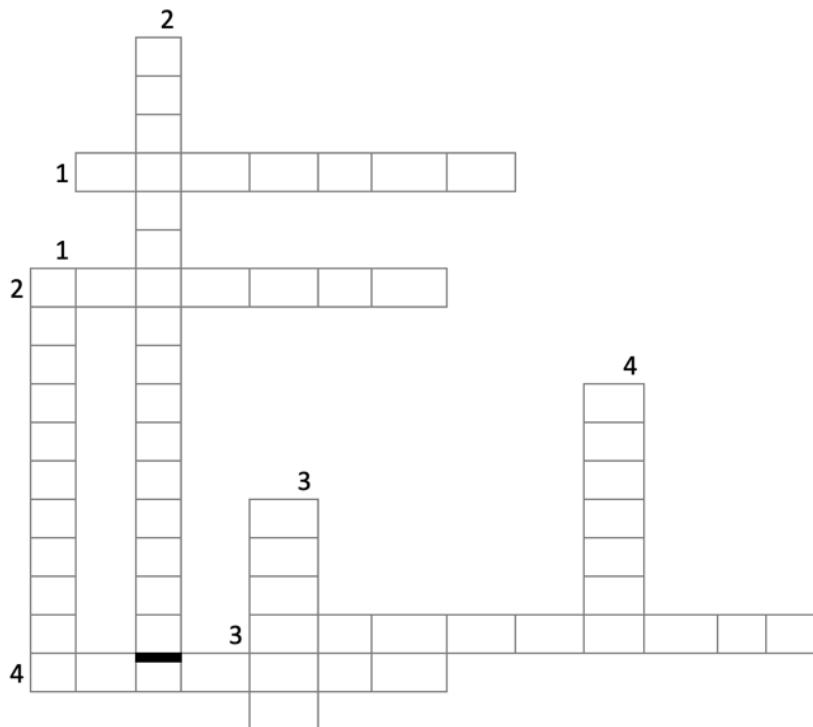
U meyaj u múuch' mootsil le chukte'obo'

U múuch' mootsil le k'áaxo'ob yáanal le ja'o' jump'éel báak'pachkuxtal jela'an. Le chukte'obo' jach ku yáantaj ti' le mejen kayo'ob yano'ob te'elo', beyxan ti' le xma' baakilo'obo yéetel le o'olkijkayo'obo'. Beyxan jump'éel kúuchil tu'ux ku tséentikuba'ob le jejeláas kayilo'ob ku chuka'alo'ob yéetel ku ko'onolo'ob te' Caribeo', je'elbix le sakbox pargoo' (Lutjanus griseus). Le kayo'ob ku chuka'alo'ob ti'al koonbilo'ob te' Caribeo' ku máansiko'ob wa jayp'éel k'iinil u kuxtalo'ob ti' le chkte'ilo' wa ti' le ja'il pradera'obo'. Wa mina'an le chukte'obo' wa ja'il pradera'obo' le u meyajil chuk kay te' Caribeo' mixtan u béeytal.

Meyajil

1. Xok le jatsil xook ka'analo', ku ts'o'okole' ka meentik le crucigramao'.

Chilikbalo'ob	Wa'alakbalo'ob
1. Le je'ela' ku jáapa'al tumen ba'alche'ob yéetel wiiniko'ob.	1. Le chukte'obo' jach ku yáantaj ti' le _____ yano'ob
2. U múuch' _____ le k'áaxo'obo' yáanal ja'o' jump'éel áak'pach kuxtal jela'an.	2. Le je'ela' ku jáapa'al tumen le chukte'obo' yéetel uláak' k'áaxo'ob.
3. Le kayo'ob ku chuka'alo'ob ti'al koonbilo'ob te' Caribeo' ku áansiko'ob wa jayp'éel k'iinil u _____ ti' le chkte'ilo' wa ti' le a'il pradera'obo'.	3. le je'ela' leti' u yotoch ya'ab ch'íich'o'ob yéetel kayo'ob.
4. Wa mina'an le chukte'obo' wa ja'il pradera'obo' le u meyajil chuk ay te' Caribeo' mixtan u	4. Beyxan jump'éel _____ tu'ux ku tséentikuba'ob le jejeláas kayilo'obo'.



2. Yéetel a t'aano'obe', tsol ba'axten le' chuk kay te' caribeo' je'el u sa'atal wa mina'an le' chukte'obo'.

Meyajts'íib

Cha'ant le oochelo', xok le yaanalts'íib yaanti'o'. Ts'íibte' bix u k'a'abéetal u mootsil le chukte'obo' ti' le pargo'obo'.



Le mejen pargo'oba' (*Lutjanus apodus*) táan u báabo'ob ichil le' chak chukte'oba' (*Rhizophora mangle*) u ti'al u kaxantiko'ob u yo'och'o'ob. Le je'elo'oba' ku jaantiko'ob mejen xma'baakel ik'el ja'ob je'exbix cangrejo yéetel ik'el ja' ku yaantalo'ob ichil moots. Beyxan je'el u béeytal u báabo'ob jach séeb ichil le mootso'obo' uti'al ma' u jaanta'alo'ob tumen nukuch kayo'ob. Kaajil: Belice. Oochel: © Antonio Busiello.

Kaan jaats

Xookil: Chukte'ob – *erosión*

U yáantaj le chukte'ob ti'al ma' u yúuchul *erosión* te' petenilo'obo'

Le chukte'obo' yaan xan u jeel u meyajo'ob: ku kanántiko'ob le peteno'ob ti' le *erosión* ku beetik le chak ik'alo'obo' yéetel le k'a'ankach ja'obo'. U moots le chukte'o'obo' bey jump'éeel wóol mootse', le je'elo'oba' ku yáantiko'ob u much'táambal le lu'umo', uti'al ma' u jubchajal ichil le k'ak'náabo' ikil u ts'áik le k'a'ankach ja'obo' yéetel le chak ik'alo'obo'. Beyxan yaan iik'o'ob tsaypachta'an yéetel k'a'ankach iik'o'ob yéetel chak ik'alo'ob. Jump'éeel mukul iik'e' ku yúuchul ken jo'osa'ak u ja'il le k'ak'náab yo'okabilo' tumen k'a'ankach iik'o'ob. Le chukte'obo' ku yáantik u kanánt le peteno'obo' ti' u beel le ja'o', ti' le erosiono' beyxan ti' uláak' talamilo'ob yaan ichil le mukul iik'o'.

Erosión

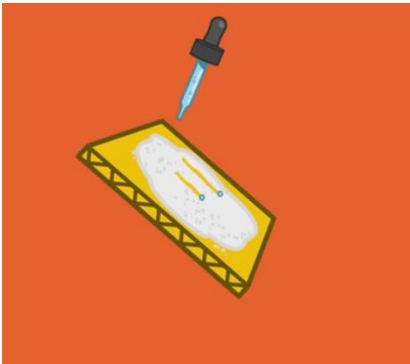
Le erosiono' leti' u bin u xu'upul le lu'umo'. Le ken úuchuk le je'elo', le lu'umo' ku p'áatal mina'an ti' nutrientes, ku nupik u beel ja' yéetel ku meentik u p'áatal mina'an che'ob wa pak'áalo'ob te' kúuchilo'.



Fuente: <https://es.wikihow.com/prevenir-la-erosión-del-suelo>

Meyajil

Te' s'úutukila' yaan ak meentik jump'éeel e'esajil ti'al ak ilik bix u bin u xu'upul le lu'um wa mina'a le chukte'bo'.



K'áatchi'ob

1. Bix a tukultik tech u k'askúantik le *erosión* le chukte'ob yaano'ob naats' tu jáal le k'ak'náabo'obo'.
2. Ka tukultik wáaj le wíiniko'ob je'el páajtal u yáantiko'ob le kúuchil chi' k'ak'náabo'ob uti'al ma' u máansiko'ob le erosiono'. Bixi'

U meyaj Barbara yéetel Johnny



Barbara yéetel Johnnye' táan u paktiko'ob jump'éeel xóot' jáal ja' tu'ux ts'o'ok u yúuchul p'íital ti' le chukte'o'. Le jáal ja'o' ts'o'ok u jach cháalal, beytuno' le ja'il áako'obo' mixtan u páajtal u ts'áiko'ob u je'ob te'elo'.

Barbara Vilarmau yéetel Johnny Hustado Aguilare' u ajkananilo'ob Refugio de Vida Silvestre Laguna Urpiano tu jáalja'il Caribe tak Costa Rica. Ti' u k'iinil u ts'áaj je' le ja'il áako'obo' leti'obe' ku máan u kaláanto'b le kúuchilo'obo yo'osal ma' u yokolta'al le je'obo'. Ku ch'úuktiko'ob u xíitil le je'obo' tumen wa ma'e' je'el u yokolta'alo'be' wa je'el u jaanta'alo'obe'. Le cháalal meenta'ab tumen úuchik u tse'elet le chukte' te'elo' yéetel yo'osal u tamamil ku taasik le u chokotal yóok'ol kaabo' jach yaj ku taasiko'ob ti' le ja'il áako'obo' yéetel xan ti' u jeel kajtalilo'ob tuláakal yóok'ol kaab. Tumen: Robby Thigpen.

Jo' jaats

Xookil: ko'ox meentik jump'éeel *vivero*.

K'a'abéet tech:

1. Mejen paak'alo'ob yaan ta wotoch (cedro, caoba, piich, óox, etc.)
2. Jump'éeel PET yaan ti' 2L.
3. Jump'éeel *tijera*.
4. Jun muut box lu'um.



Bix ken a meentej:

1. Kaxt jump'éeel kúuchil tak ta najil xook bey tu'ux bo'oye' chen ba'ale bey ka juulnak xan u sáasil le k'iin kex junsúutuk.
2. Yéetel le *tijerao'*, xot chúumuk tak tu ka'anlil le PETo'.
3. Ichil jump'éeel ch'óoye', xa'ak't le lu'um yéetel u xe'ek'a'anil tu'ba'alo'. Chup tak chúumuk ti' jejeláas chúuj yéetel le lu'um ta xa'ak'tajo'.
4. Ts'áaj jump'éeel pak'al ti' jejeláas PETo'obo'. Tsiibt le chuujob yéetel u k'iinil uchik u yúuchul le pak'alo', ba'ax che'il yéetel u k'aaba' le xoknáalo'.
5. Ts'aláant le chúujob te' kuuchil kaxk'ajo'. Joya'at le pak'alo'ob sáansamalo'.
6. Le pak'áalo'obo' yaan u pa'ak'al ti' lu'um chen nojochajko'ob tak 45-50 CM u ka'analil. Yéetel a ajka'ansaj wa xka'ansaje', k'aate'ex u yáantaj le u jo'olpóopil le kaajo' uti'al u yántike'ex a kaxte'ex jump'éeel kúuchil bey tu'ux je'el u páajtal a pak'ike'ex', je'ebix xan ba'ax k'iinil yéetel bix ken a beete'ex.



Framboyán de Madagascar (*Delonix regia*), jump'éeel k'áax ku taal tu baatsil [fabáceas](#). Jump'éeel che' jach ya'ab u boonilo'ob u loolo'ob. Beyxan jach ma'alo'b u ya'axil u le'ob. Ku k'uchul u ka'anlil kech 12M.

Wak jaats

Ko'ox ilik bix u bin a kaambal

1. Tsolnu'uk. Xok le chuka'antuukulo'ob ku ts'áabal ti' techo' ku ts'o'okole' ka wa'alik wa jaaj wa tuusil.

Chuka'antuukul	Jaaj	Tuusil
1. U k'ab le chukte'obo' ku k'a'abéetal ti' ch'fich'o'b ti'al u yotocho'ob beyxan ti'al u yaantal u mejenilo'ob.		
2. Le chukte'obo' ku jáapiko'ob <i>oxígeno</i>		
3. Jump'éel ichil le ba'axo'ob meentik u chokotal yóok'ol kaabo' leti' le CO2, le je'ela' ku taal ti' u too'ka'al combustibes fósiles, je'exbix le ku taalo'ob ti' petróleo yéetel ti' chúuk.		
4. U moots le chukte'obo' jach ku yáantaj ti'al u kuxtal mejen kayo'ob.		
5. Wa mina'an le chukte'obo' u meyajil le chuk kayo'ob te' Caribeo mixtan u béeytal.		
6. Le chukte'obo' jach ku yáantajo'ob ti'al ka séeb úuchuk <i>erosión</i> te' jáal k'ak'náabo'.		
7. U múuch' moots le chukte'obo' ku meentiko'ob u ch'a'ik u muuk' le lu'umo', beytuno' mixtan u séeb <i>erosionar</i> .		

2. Tsolnu'uk. Ts'iib óoxp'éel wa kaanp'éel ba'alo'ob ti' ku yáantaj le chukte'obo'.





TO'ONE' AJKANAN K'AK'NÁABO'ON MA' SU'UP'IL.
¡BEYXAN TE'EX!



Sayab Miats



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