

Kanan K'ak'náab Ma' Su'up'il

Ku taasik te'ex



U kisinil yóok'ja' (*Pterygoplichthys pardalis*)

Edición Escuela Primaria-Ti'al primaria najil xooko'ob

Edición de Quintana Roo en Maya [yua]

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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

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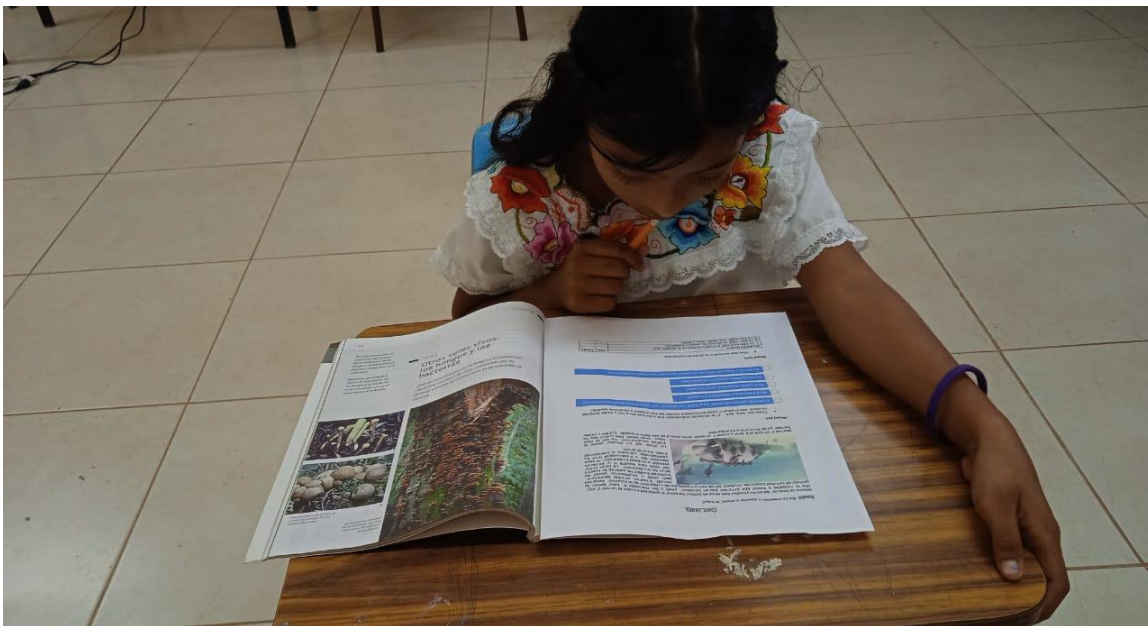
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If you would like to have one of these books in your mother tongue, contact us and we will try to work with you to make this happen. All peoples and all languages are welcome here!

Senyacen Olga Anahi Ocaña Quen juntúul xoknáal ti' 4º 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 síijik. 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' *Anahi* táan u kanik yo'osal chilo'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.

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



Senyacen Olga Anahi Ocaña Quen is a 4th grade student at the *Andrés Quintana Roo Indigenous Primary School* in *la Esperanza, Quintana Roo, México*. In her home and when playing with her friends she speaks Maya [yua], but all of her textbooks are in Spanish. Just like everyone she receives two types of education. There is the education she receives at home that begins when she was born. Then there is the education she 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 *Anahi* is learning about the Scarlet Macaw in a text book written in Maya for her. She has never learned to read and write in Maya. Now she is learning more about the world around her while learning to read and write in her mother tongue. Today her two education systems have been brought together to make these linguistically diverse education systems a place of greater opportunity.

Anahi is Marine Conservation without Borders and you can be too!



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

Le jaatsil áanalte'a' *U kisinil yóok'ja'* ku taal ti' le nojoch áanalte' ku k'aba'atik Tsooyilo'ob ts'íibta'an tumen Kanan K'ak'náb ma' Su'up'il. Meenta'abij yéetel u yáantaj Juan J. Schmitter-Soto, Rigoberto Quintana, Martha E. Valdez-Moreno yéetel Roberto L. Herrera Pavón ku meyajo'ob *El Colegio de la Frontera Sur (ECOSUR)* yéetel *Departamento de Pesca de Belice*.



Le oochelo'ob ku chíikpajalo'ob waye' jts'áabo'ob tumen Cora Berchem ku meyaj ti' *Save The Manatee Club* beyxan tumen *Departamento de Pesca de Belice* yéetel *ECOSUR*.



Sayab Miats

Le STEM curriculum biocultural yo'osal *Xt'uut'o'ob ti' Centroamérica – u Kolnálilo'ob K'áax ts'íibta'ab* yéetel sutts'íibta'ab ich maaya tumen Robby Thigpen yéetel Hilario Poot Cahun ku meyajo'ob ti' Kanan K'ak'náb ma' Su'up'il yéetel Sayab Miats AC.



SECRETARÍA DE EDUCACIÓN

Le STEM plan de estudios 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



FLORIDA INTERNATIONAL UNIVERSITY



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!

The chapter *Treasures of the River* (The Devil in the River) is from the Marine Conservation without Borders *Treasures Collection*. It was developed using content provided by Juan J. Schmitter-Soto, Rigoberto Quintana, Martha E. Valdez-Moreno yéetel Roberto L. Herrera Pavón of the El Colegio de la Frontera Sur (ECOSUR) and the Belize Fisheries Department.



ECOSUR



DEPARTMENT
 Sustainable Fisheries
 For Our Future

Images provided by Cora Berchem of the Save The Manatee Club, the Belize Fisheries Department and ECOSUR.



Sayab Miats

The *Treasures of the Forest* 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.

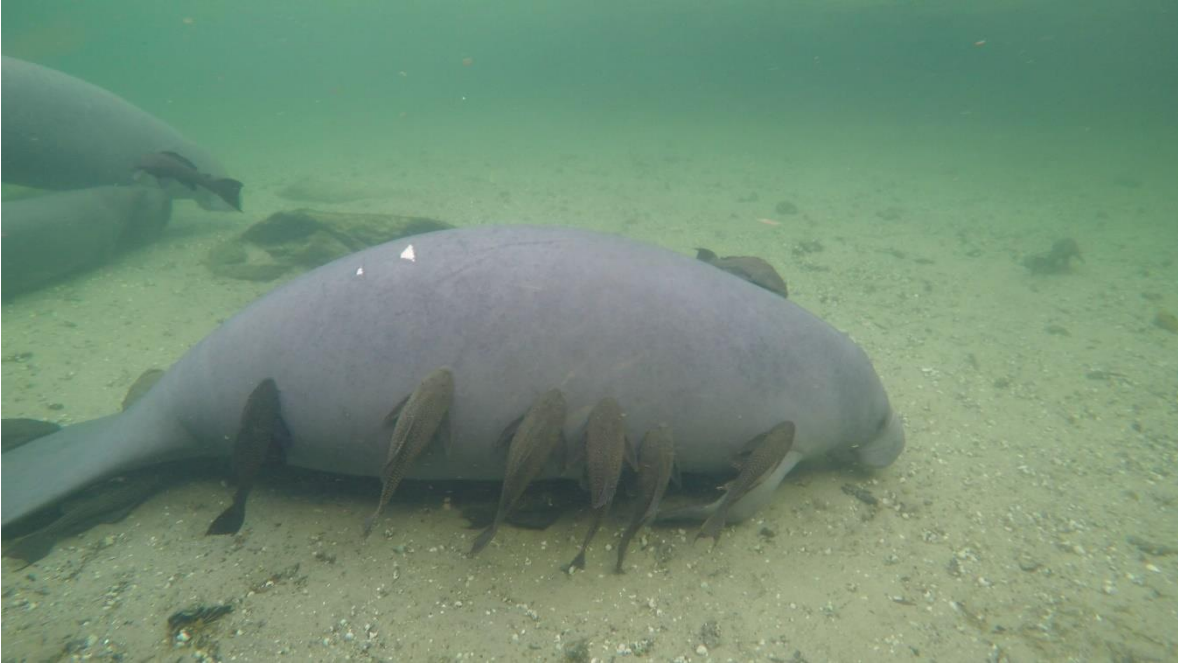


This biocultural STEM curriculum will be included in a textbook titled *Treasures of the Yucatán* and was developed for Indigenous primary schools in Maya communities in Quintana Roo for the *Departamento de Educación Indígena de la Secretaría de Educación de Quintana Roo*.



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*.

U kisinil yóok'ja' (*Pterygoplichthys pardalis*)



U kisinil yóok'ja' (*Pterygoplichthys pardalis*)

Xu'uk'il meyaj: Yaan a woksaj óoltike' yaan ba'alche'obe' ku k'askúunsiko'ob le kúuchil tu'ux ku kuxtalo'ob wa tu'ux ku k'uchulo'ob yaantalo'.

Yáax jaats

Xookil: Ba'ax juntúul kisin kay

Le kaya' leti' le *Pterygoplichthys pardalis*, ku yaantal America del Sur. Ku ya'ala'al ti' kisin kay. Ku



p'isik kex 45-75 Cm. yéetel u yaalile' kex 1-3 Kg. leti'e' je'el u kuxtal tak 15 ja'abo'obe'. U ch'ie' ma' chen ku k'a'abéetal ti' leti' ti'al u jáapik u yo'ochi', ku k'a'abéetal ti' leti' ti'al u chu'uchik ts'uuy ba'alo'ob ti'al ma' u bisa'al tumen u muuk' le ja' tu'ux ku yaantalo'. Leti' xane' ku k'a'abéetkunsik u chi'o' ti'al u ch'a'ik u yíik'. Ojela'ane' le kaya' je'el u meentik ya'abkach súutukil yo'okabile' tumen ku ch'a'ik u yíik' yéetel u chi'. Lebeetike' wa p'a'atak tu jáal le ja'o' je'el u tsa'ayal suut tu junal ichile'.

Le kay je'ela' ma' jach séeba'an u yaantal u mejenilo'obi'. Le ch'upul kayo' ku ts'áik kex 500-3000 je'ob (le je'ela' ma' ya'abi', yaan juntúul k'ak'as kay ku k'aaba'atik koj kay, leti'e' ku ts'áik tak 3,000,000 je'ob). Chen ba'ale' le

kisin kayo' ku ya'abtalo'ob tumen ku paklan kanáantikuba'ob. Ku kaxtik kúuchilo'ob tu'ux u ta'akik u je'ob.

Meyaj jun

- Joronts'íibt le wooj ka tukúultik ma'alobo'.

1. Tu'ux sijnaal le kisin kayo' (*Pterygoplichthys pardalis*).

a) Tu lu'umil Europa	b) Tu lu'umil Africa	ch) Tu lu'umil Centroamérica.
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2. Buka'aj ku p'isik u chowakil le kay je'ela'.

a) 45 tak 75 Cm.	b) 80 – 95 Cm.	ch) 20 tak 35 Cm.
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3. Buka'aj ku náakal u yaalil le kisin kayo'.

a) Tak 10 Kg.	b) Ichil 1 – 3 Kg.	ch) Ichil 8 – 10 Kg.
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4. Kex jayp'éel je'ob ku ts'áaik juntúul ch'uup kisin kay.

a) Tak 3,000,000	b) Ichil 500 – 3000	ch) Seten ya'ab.
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5. Ba'axten ku ya'abtal le kisin kayo'ob kex ma' ya'ab je'ob ku ts'áiko'obi'.

a) Tumen ku paklan kanáantikuba'ob.	b) Tumen ku tséenta'alo'ob.	ch) Tumen ku láaj xíitil le je'obo'.
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Meyaj ka'a

- Ts'íibt le óoxp'éel ba'ax ti' le ku k'a'abéetal u chi' le kisin kayo'.

1. _____ 2. _____ 3. _____

Ka'a jaats

Xookil: Ba'axten ku ya'ala'al ti' kisin kay

Tumen juntúul kay jach k'asa'an. Ya'ab talamil ts'o'ok u taasik tu ja'ilo'ob Usumacinta-Grijalva, México. Le je'elo'oba' ts'o'ok u xu'ulsiko'ob jejeláas ba'alkabilo'ob, beyo' ku xu'ulsiko'ob kuxtalilo'ob beyxan ku taasiko'ob talamil ti' chuk kay tu lu'umil México yéetel Centroamérica. Ti' le chichank'ak'náabo'ob yéetel yóok'ja'ob tu'ux yano'ob le kisin kayo'obo', u ya'abtalobe' ts'o'ok u meentik u bin u xu'upul u xuul le ja'obo', lela' ku meentik u k'astal le ja'o' yéetel ku meentik u bino'ob



le ja'il ba'alche'ob ku yaantalo'ob te'elo'. Le kisin kayo'oba' ku tséentikuba'ob yéetel u xiixel tu' ba'alo'ob, beyxan yéetel je'ob. Tumen bey u tséentikuba'obo' ku meentiko'ob u yaktal xiixelo'ob yéetel u yéek'tal le ja'o'. Lebbetike' le ja'ob tu'ux ku yaantal le kisin kayo'obo' jach éek'tako'ob.

Ti' le kúuchilo'oba' le ken a pul u un'ukulil a táabsik kaye' le ken a jo'ose' 90% le ken a

chuko' leti' le kisin kayo'. Leebtike' le ajchuk kayo'ob ku koniko'ob mojarra wa pargoo' táan u máansiko'ob talamil. Le kisin kayo' je'el u páajtal u jaanta'ale', ba'ale' mixmáak manik, jach yaan u yejo'ob yéetel ts'u'uytako'ob, beytuno' ku k'askúuntiko'ob u nu'ukul meyaj le ajchuk kayo'obo'. Kex juntúul kay jach óotsil a wilik ken a pakte' ba'ale' jach k'asa'ano'ob, lebbetike' ku ya'ala'al ti'ob kisin kayo'ob. Ichil le yóok'ja' Bravoo' le kayo'oba' tu k'askúunsajo'ob kex 80 Km. chen ichil óoxp'éel wi'inal. Lela' ku ts'áik 320 Km. ti' jump'éel ja'ab. Ikil táan ik xokik le ts'íiba', te' súutukila' táan u máan u báabo'ob te' yóok'ja'il Hondoo'.

Meyaj jun

- K'al yéetel chak boonil le talamilo'ob ku taasiko'ob le kisin kayo'ob tu'ux ku k'uchulo'ob yaantalo'.

Ku jaantiko'ob uláak' kayo'ob

Ku yéek'kunsiko'ob le ja' tu'ux kajakbalo'obo'

Ku taasiko'ob taalamilo'ob ti' ajchuj kayo'ob.

Ku k'oja'ankúunsik wíiniko'ob naats'o'ob ti'ob.

Ku meentiko'ob u xu'upul u xuul le yóok'ja'ob tu'ux yaano'obo'.

Ku taasiko'ob ki'imak óolal ti' aj chuk kayo'ob.

Ku yáalkabkunsiko'ob le ba'alche'ob yano'ob tu'ux ku k'uchulo'obo'.

Meyaj ka'a

- Yéey jaaj wa tuusil ti' le chuka'an tuukulo'oba'.

Chuka'an tuukul	Jaaj	Tuusil
1. Le kisin kayo'obo' ya'ab talamilo'ob ts'o'ok u taasiko'ob ti' u yóok'ja'ilo'ob Grijalva yéetel Usumacinta		
2. Le kisin kayo' je'el u páajtal u jaanta'al tumen wíinike'.		
3. Ti' le yóok'ja' Bravoo' le kisin kayo'oba' ts'o'ok u k'askúuntiko'ob kex 320 Km.		

Óox jaats

Xookil: Ba'ax meentik u yaantal u muuk' le kaya'

Máans ta tuukule' ba'ax ku yúuchul ken oksa'ak juntúul ba'ache' ti' jump'éeel kúuchil tu'ux ma' ti' s'íiji'. Wa tu náajaltaj u kuxtal kex jump'éeel jela'an kúuchile', yaan u bin ma'alobil ti'. Lela' tumen tu jechajo'ob tuláakal toopilo'ob, beytuno' leti'ob ken u meentuba'ob u nojochilo'ob le kúuchilo'. Jump'éeel



múuch' k'asa'an ch'i'ibal ba'alche'e', jach séeb u ya'abtalob yéetel ku topiko'ob kuxtalo'ob yano'ob te' kúuchil tu'ux ku k'uchulo'obo'. Le ba'ax je'ela' leti' bisik ka'a kúuchil ti' le ba'alo'ob meentik u ch'éejel kuxtalo'obo', la yáax kúuchilo' leti' u k'askúunta'al tu'ux ku yaantalo'obo' (Je'exbix u k'askúunajil k'áax, wa u tijil ja'ob).

Le je'ela' leti' ku yúuchul yéetel le k'ak'as ba'alche'obo', wa leti' le kisin kayo', asab talam. Kex juntúul kay ku

yaantal ti' ch'ujuk ja'e' je'el u kuxtal ti' ch'óoch' ja'ob yaan ti'ob kex 8psu u ta'abile'. U k'áat u ya'ale' leti'obe' ya'ab tu'ux je'el u t'it'ikuba'obe'.

Meyaj jun.

- Ts'íibt jun, ka'a, óox... ti' le chuka'an tuukulo'oba' ti'al a we'esik bix u bin u kuxtal jump'éeel ba'alche' ken k'uchuk ti' jump'éeel túumben kúuchil tak ken p'áatak u nojochil le kúuchilo'.

U wíinkilil yéetel u kuxtale' ku p'áatal ma'alobil ti' leti' yéetel ku p'áatal yaantal te'elo'.

Ku p'áatal bey u nojochil le kúuchilo'.

Ku k'uchul wa ku bisa'al te' kúuchilo'

Ku láaj jéeltik tuláakal le talamilo'obo'

Ku káajal u máansik talamilo'ob tumen jump'éeel túumben kúuchil ti' leti'

Meyaj ka'a

- Yéey jaaj wa tuusil ti' le chuka'an tuukulo'oba'.

Chuka'an tuukul	Jaaj	Tuusil
1. Le kisin kayo'obo' je'el xan u kuxtalo'ob ti' ch'óoch' ja'e'.		
2. Le kisin kayo' ya'ab tu'ux ku páajtal u kuxtalo'ob.		
3. Le kisin kayo' jach neets. Séeb u kíimil.		

Kan jaats

Xookil: Bix u ch'éejsa'al le kayo'oba'

Tukulta'abe' le ya'abkach áayimo'ob kajakbalo'ob te' kúuchilo'oba' yaan u yáantajo'ob ti'al u ch'éejel le kayo'oba'. Ba'ale' ma' úuchuk beyo'. In wa'alike' le áayimo'obo' ma' ki'ak u yu'ubiko'ob kayo'ob ts'u'uytak u paacho'obi'. U xu'u'ulsa'al le kayo'oba' jump'éeel ba'aj ma' béeyaki'. Ti' uláak' tséelile', le kayo'oba' táan u k'a'abéetkunsalo'ob tuláakal tu'ux ti'al u ts'i'ibankúunsiko'ob acuariob. Beytuno' tuláakal tu'ux yano'ob be'elajake'. U k'aasile', leti'obe' yaan u jáalk'abta'alo'ob ichil le k'ak'náab ken nojochlako'ob, tumen le wíiniko'obo' chen ku k'a'abéetal ti'ob tu mejenilo'ob. Ken nojochlako'obe' le



máako'obo' ku bisiko'ob le kayo'oba' ti' jump'éeel chichank'ak'náab wa yóok'ja', leti'obe' ku tukultiko'obe' uts ba'ax ku meentiko'ob, ma' u yojelo'obe' táan u puliko'ob juntúul k'ak'as kay ichil I ja'o'.

In wa'alike' u xu'ulsa'al le kayo'oba' jach táaj talam, ba'ale' ma' u cha'abal u ya'abtalo'obe' jump'éeel ba'ax jach páaybe'en u beeta'al. Beytuno', Le Sistema de Alerta Temprana de Belice y México' jump'éeel Sistema ku meyaj yo'osal le ba'ax je'ela'. Le

ajchuk kayo'obo' ku bo'olta'alo'ob ti'al ka u chuko'ob le kisin kayo'obo'. Beyxan, be'elajak k'iine' yaan xak'alo'ob ku meenta'alo'ob yo'osal u yila'al ti' ba'ax uláak' je'el u páajtal u k'a'abéetkunsalo'ob le kisin kayo'oba', jump'éeel le ku tukulta'alo' leti' u ba'alita'al ti'al u meenta'al u yo'och ch'íich'o'ob. Ba'ale' le taak'in kun náajaltbil yéetel u yo'och le ch'íich'o'obo' mixba'al tu tséel le talamilo'ob ku meentiko'ob le kayo'ob ti' le ja'obo'. Je'el u páajtal a wáantiko'on ikil ma' a jáalk'abtik le kayo'ob je'elo'oba' ichil le ch'ujuk ja'obo'. E'es ti' uláak' wíiniko'ob le ba'axo'ob ts'o'ok a kanik waye'.

Meyaj jun

- Chukbées le chuka'an tuukulo'oba'.

1. Tukulta'abe' le kayo'oba' yaan u jaanta'alo'ob tumen _____.
2. in wa'alike' le áayimo'obo' ma' ki' u yu'ubiko'ob _____.
3. U xu'ulsa'al le kayo'oba' jump'éeel ba'aj _____.
4. Le kayo'oba' táan u k'a'abéetkunsalo'ob tuláakal tu'ux ti'al _____.
5. Ken nojochlako'obe' le máako'obo' ku bisiko'ob le kayo'oba' ti' _____.

Núuk le k'áatchi'oba'.

1. K'a'abéet wa u ch'éejsa'al le kisin kayo'obo'.
2. Ba'ax u meyaj le Sistema de Alerta Temprana de Belice y México'.
3. ba'ax ku tukulta'al u meenta'al yéetel u bak'el le kisin kayo'obo'.

Jo' jaats

P'iskaambal

- K'al le wooj ka tukultik ma'alob u núukik le k'áatchi'oba'.

1. Tu'ux sijnáal le kisin kayo' (*Pterygoplichthys pardalis*).

a) Tu lu'umil Europa	b) Tu lu'umil Africa	ch) Tu lu'umil Centroamérica.
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2. Buka'aj ku p'isik u chowakil le kay je'ela'.

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4. Kex jayp'éel je'ob ku ts'áaik juntúul ch'uup kisin kay.

a) Tak 3,000,000	b) Ichil 500 – 3000	ch) Seten ya'ab.
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5. Ba'axten ku ya'abtal le kisin kayo'ob kex ma' ya'ab je'ob ku ts'áiko'obi'.

a) Tumen ku paklan kanáantikuba'ob.	b) Tumen ku tséenta'alo'ob.	ch) Tumen ku láaj xiitil le je'obo'.
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- Yéey jaaj wa tuusil ti' le chuka'an tuukulo'oba'.

Chuka'an tuukul	Jaaj	Tuusil
1. Le kisin kayo'obo' ya'ab talamilo'ob ts'o'ok u taasiko'ob ti' u yóok'ja'ilo'ob Grijalva yéetel Usumacinta		
2. Le kisin kayo' je'el u páajtal u jaanta'al tumen wíinike'.		
3. Ti' le yóok'ja' Bravoo' le kisin kayo'oba' ts'o'ok u k'askúuntiko'ob kex 320 Km.		

- Núuk le k'áatchi'oba'

1. Yaan wáaj juntúul ba'alche' a k'ajóol ku k'askúuntik tu'ux ku yaantal.

2. Wa mix a k'ajóol mixjuntúule', k'áat ti' juntúul a baatsil wa u yojel leti'. Ku ts'o'okole' ka ts'íibtik u k'aaba' waye'.

3. Ba'ax talamil ku taasik le ba'alche'a'.

4. Bix u ch'éejsa'al le ba'alche' je'ela'.



TO'ONE' AJKANAN K'AK'NÁABO'ON MA' SU'UP'IL.
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