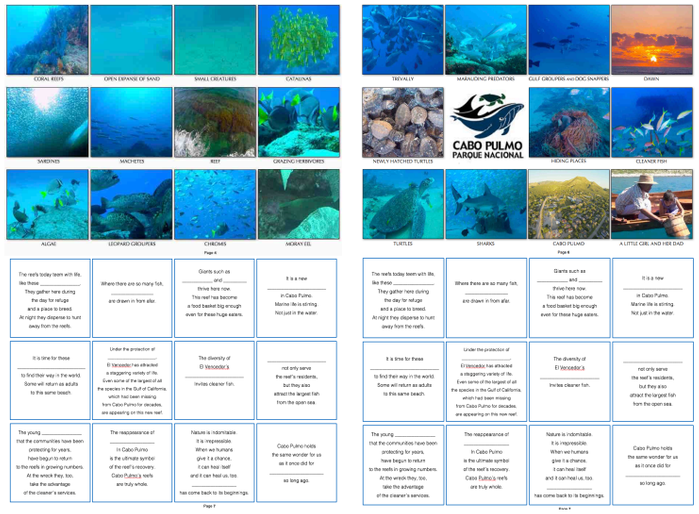
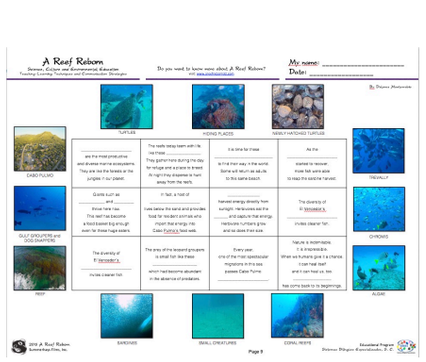
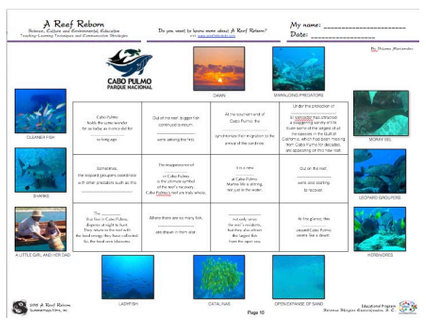
Educator´s Guide

Printable and extra materials and presentations



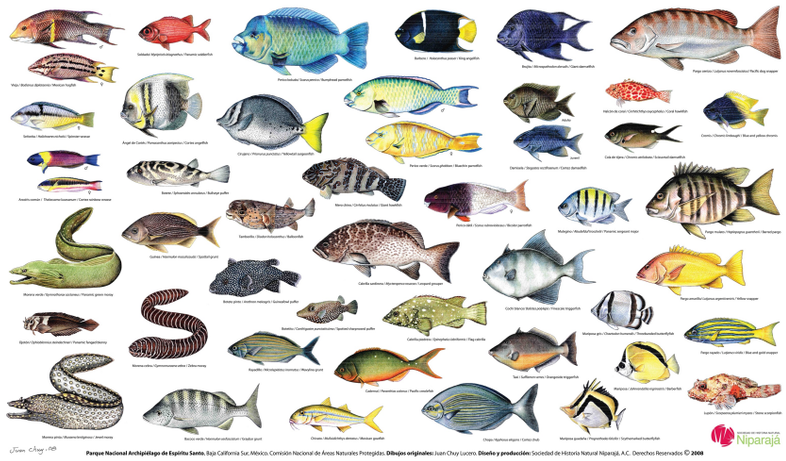


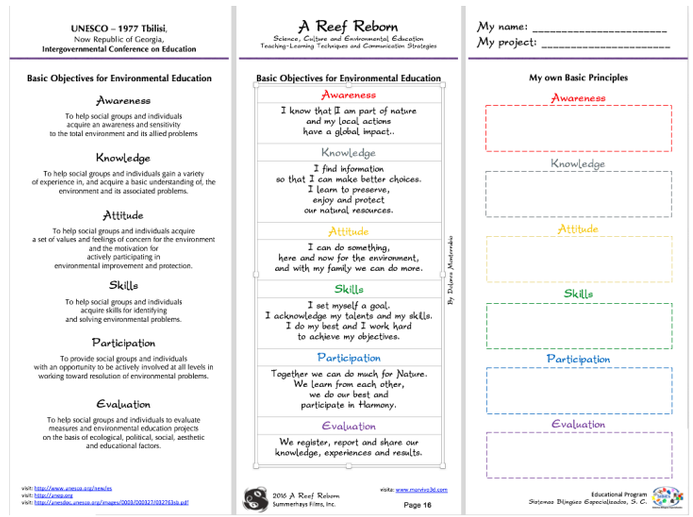


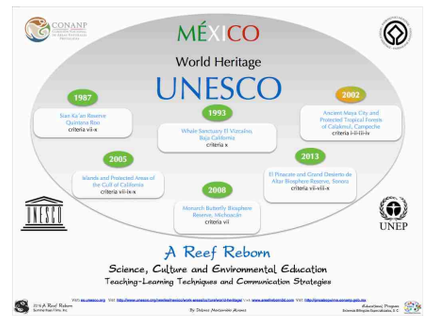
abundance	amazement	awareness	conservation
cooperation	choice	effort	hope
success	happiness	inspiration	opportunity
participation	protection	recovery	shelter
rebirth	resilience	revival	livelihood
survival	treasure	triumph	bravery

abound	amaze	create awareness	conserve
cooperate	make a choice	make an effort	have hope
be successful	be happy	inspire	have or give opportunity
participate	protect	recover	take or seek shelter
be reborn	be resilient	revive	survive
outlast	treasure	triumph	be brave

visit: www.areefreborn3d.com







A Reef Reborn

Science, Culture and Environmental Education for the XXI Century

Teaching-Learning Techniques and Communication Strategies

By Dolores Monterrubio Alvarez

In collaboration with Summerhays Films and with the authorization of the Sociedad de Historia Natural NIPARAJÁ, CONANP and SOMAC.

2016 A Reef Reborn
Summerhays Films, Inc

Educational Program
Sistemas Bilingües Especializados

Printable and extra materials and presentations

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Introduction

We are very glad to present the first version of the **printable and extra materials and presentations** that we have been creating during the production of A Reef Reborn.

These materials, together with the **Educator´s Guide** are available, for **educational purposes** only, on the Webpage **www.areefreborn3d.com**

We want to thank all the people and organizations who have given us their feedback, authorization and unconditional support to create these materials that reinforce and enrich the content and the message of the film A Reef Reborn, based on the **20 YEARS of SUCCESS in CONSERVATION in the Cabo Pulmo National Park**.

The main objective of the **Educational Program** is to bring this story of **resilience**, **success** and **conservation** in the Gulf of California to more places in Mexico, even to places far from this wonderful sea, by using the movie A Reef Reborn as an **educational tool** that can be adapted to different levels and school subjects to learn more about **science**, **nature**, **conservation**, **best environmental practices**, the **transformation of a culture** and, above all, to use these topics to reinforce and enrich the **learning-teaching process** and the **development** of **skills** and **communication strategies** in our **classes**, **projects** and **educational programs**.

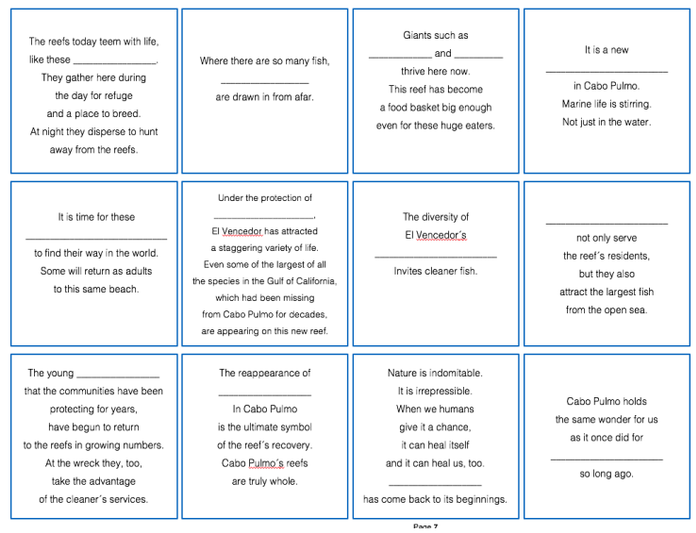
Dolores Monterrubio

Educational Program A Reef Reborn

Matching texts and pictures

The following pictures and texts are from A Reef Reborn and they represent topics such as: ecosystems, food web, energy, migrations, coral reefs, algae, herbivores, relations among organisms, adaptations, artificial reefs, biodiversity, cleaner fish, nature, the recovery of a reef, a truly whole reef, participation of the community, conservation, etc.

The objective of this activity is to awaken our audience´s curiosity and encourage educators and students to learn more and visit: www.areefreborn3d.com



If you want to learn more about fish in A Reef Reborn visit: http://areefreborn3d.com/explore-the-reef/about-the-fish/
If you want to see video clips of A Reef Reborn visit: http://areefreborn3d.com/see-the-film/clips/

Do you want to know more about A Reef Reborn?
visit: www.areefreborn3d.com

Suggestions for the activity

Materials

- ✓ Print the 2 pages of pictures and the 2 pages of texts and cut every square.

Objective of the activity

- o Remember and reinforce the information of A Reef Reborn with the 24 cards of pictures and texts.
- o Awaken our audience´s curiosity to learn more about A Reef Reborn.

Ideas

There are many ways in which we can use these cards.

We can give the cards **before** watching the movie, some will have a card with a picture and others a card with the text.

During the movie, we will listen and see the information in the cards..

At the end of the movie, the participants look for the matching cards and they talk about what they heard and learned about their cards.

We can ask our participants the following:

- ❑ Read each card and describe the pictures.
- ❑ Look for their match and talk about what they learned about what they have in their cards.
- ❑ Formulate a question that can be answered with the information in the cards.
- ❑ Formulate a question that starts with… What would happen if …?
- ❑ Listen to the possible answers and encourage participants to search for the answers to their questions.
- ❑ Educators and students can visit: http://areefreborn3d.com/explore-the-reef/ to find the answers to their questions and learn more about Cabo Pulmo, its history and conservation, its marine and terrestrial biodiversity, coral reefs, fish and much more.

By Dolores Monterrubio

CORAL REEFS

OPEN EXPANSE OF SAND

SMALL CREATURES

CATALINAS

SARDINES

MACHETES

REEF

GRAZING HERBIVORES

ALGAE

LEOPARD GROUPERS

CHROMIS

MORAY EEL

_____

are the most productive and
diverse marine ecosystems.
They are like the forests or the
jungles in our planet.

At first glance, this

_____

around Cabo Pulmo
seems like a desert.

In fact, a host of

_____

lives below the sand
and provides food for
resident animals who import
that energy into
Cabo Pulmo´s food web.

The

_____,

that live in Cabo Pulmo,
disperse at night to hunt.
They return to the reef with
the food energy
they have collected.
So, the food web blossoms!

Every year,
one of the most spectacular
migrations in this sea
passes Cabo Pulmo:

_____.

At the southern end of
Cabo Pulmo, the

_____

synchronize their migration to
the arrival of the sardines.

As the

_____

started to recover,
more fish were able
to reap the sardine harvest.

Out on the reef,

_____

were also starting
to recover.

_____

harvest energy directly
from sunlight.
Herbivores eat the _____
and capture that energy.
Herbivore numbers grow
and so does their size.

Out of the reef, bigger fish
continued to return.

_____

were among the first.

The prey of the leopard
groupers is small fish like these

_____

which had become abundant
in the absence of predators.

Sometimes,
the leopard groupers
coordinate with other
predators such as this

_____.

TREVALLY

MARAUDING PREDATORS

GULF GROUPERS AND DOG SNAPPERS

DAWN

NEWLY HATCHED TURTLES

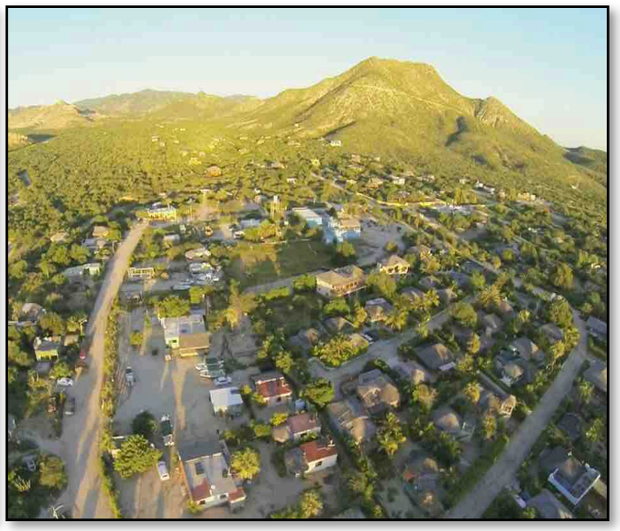
CABO PULMO
PARQUE NACIONAL

HIDING PLACES

CLEANER FISH

TURTLES

SHARKS



CABO PULMO

A LITTLE GIRL AND HER DAD

The reefs today teem with life,
like these _____.
They gather here during
the day for refuge
and a place to breed.
At night they disperse to hunt
away from the reefs.

Where there are so many fish,
_____
are drawn in from afar.

Giants such as
_____ and _____
thrive here now.
This reef has become
a food basket big enough
even for these huge eaters.

It is a new
_____
in Cabo Pulmo.
Marine life is stirring.
Not just in the water.

The diversity of
El Vencedor´s
_____
invites cleaner fish.

Under the protection of
_____,
El Vencedor has attracted
a staggering variety of life.
Even some of the largest of all
the species in the Gulf of California,
which had been missing
from Cabo Pulmo for decades,
are appearing on this new reef.

The diversity of
El Vencedor´s
_____
invites cleaner fish.

_____
not only serve
the reef´s residents,
but they also
attract the largest fish
from the open sea.

The young _____
that the communities have been
protecting for years,
have begun to return
to the reefs in growing numbers.
At the wreck they, too,
take the advantage
of the cleaner´s services.

The reappearance of
_____
in Cabo Pulmo
is the ultimate symbol
of the reef´s recovery.
Cabo Pulmo´s reefs
are truly whole.

Nature is indomitable.
It is irrepressible.
When we humans
give it a chance,
it can heal itself
and it can heal us, too.
_____
has come back to its beginnings.

Cabo Pulmo holds
the same wonder for us
as it once did for
_____
so long ago.

A Reef Reborn worksheet

The film A Reef Reborn has a lot of material and information for us, as educators, to create our own materials. One example is this exercise.

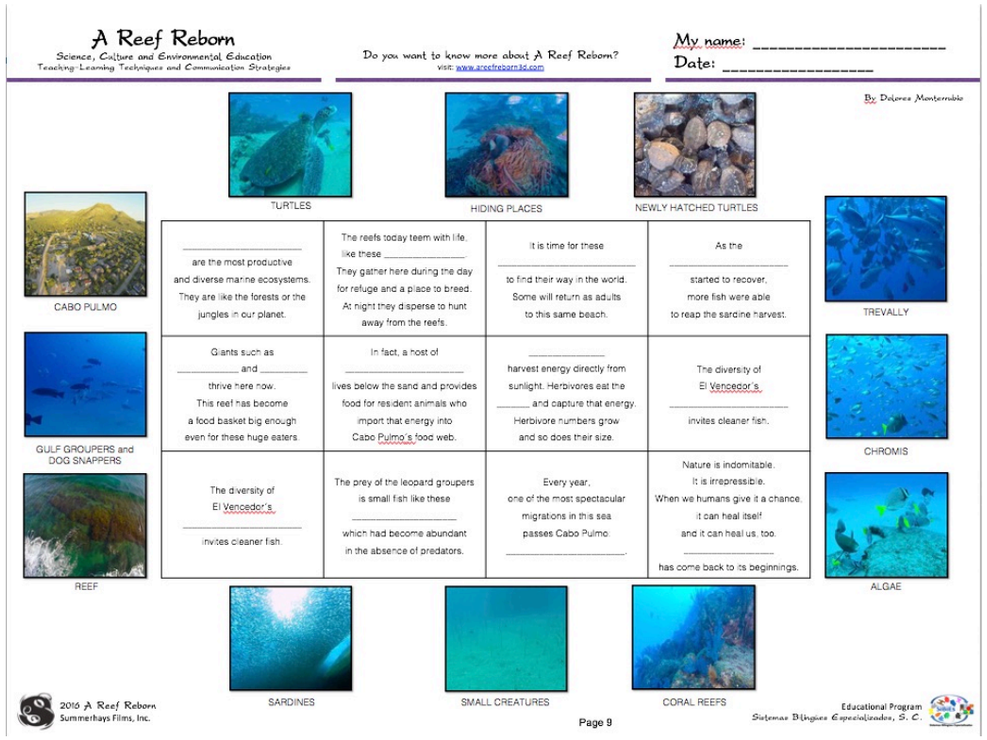
From the video, I chose 24 parts of A Reef Reborn and I distributed them in two different worksheets.

The topics that we can talk about, research and study are the following:

Ecosystems, foodweb, energy, migrations, coral reefs, algae, herbivores, relations among species, adaptations, artificial reefs, biodiversity, cleaner fish, the recovery of the reef, nature, a truly whole reef, participation of the community, conservation, etc.

This activity can provide topics for research and show and tell.

There is so much to learn and do with the information that we can find in A Reef Reborn!


A Reef Reborn
Science, Culture and Environmental Education
Teaching-Learning Techniques and Communication Strategies

Do you want to know more about A Reef Reborn?
visit: www.areefreborn3d.com

My name: _____
Date: _____

By Dolores Monterrubio

TURTLES | HIDING PLACES | NEWLY HATCHED TURTLES

CABO PULMO

_____ are the most productive and diverse marine ecosystems. They are like the forests or the jungles in our planet.

The reefs today teem with life. Like these _____. They gather here during the day for refuge and a place to breed. At night they disperse to hunt away from the reefs.

It is time for these _____ to find their way in the world. Some will return as adults to this same beach.

As the _____ started to recover, more fish were able to reap the sardine harvest.

TREVALLY

GULF GROUPERS and DOG SNAPPERS

Giants such as _____ and _____ thrive here now. This reef has become a food basket big enough even for these huge eaters.

In fact, a host of _____ lives below the sand and provides food for resident animals who import that energy into Cabo Pulmo's food web.

_____ harvest energy directly from sunlight. Herbivores eat the _____ and capture that energy. Herbivore numbers grow and so does their size.

The diversity of El Vencedor's _____ invites cleaner fish.

CHROMIS

REEF

The diversity of El Vencedor's _____ invites cleaner fish.

The prey of the leopard groupers is small fish like these _____ which had become abundant in the absence of predators.

Every year, one of the most spectacular migrations in this sea passes Cabo Pulmo. _____.

Nature is indomitable. It is irrepressible. When we humans give it a chance, it can heal itself and it can heal us, too. _____ has come back to its beginnings.

ALGAE

SARDINES | SMALL CREATURES | CORAL REEFS

2016 A Reef Reborn
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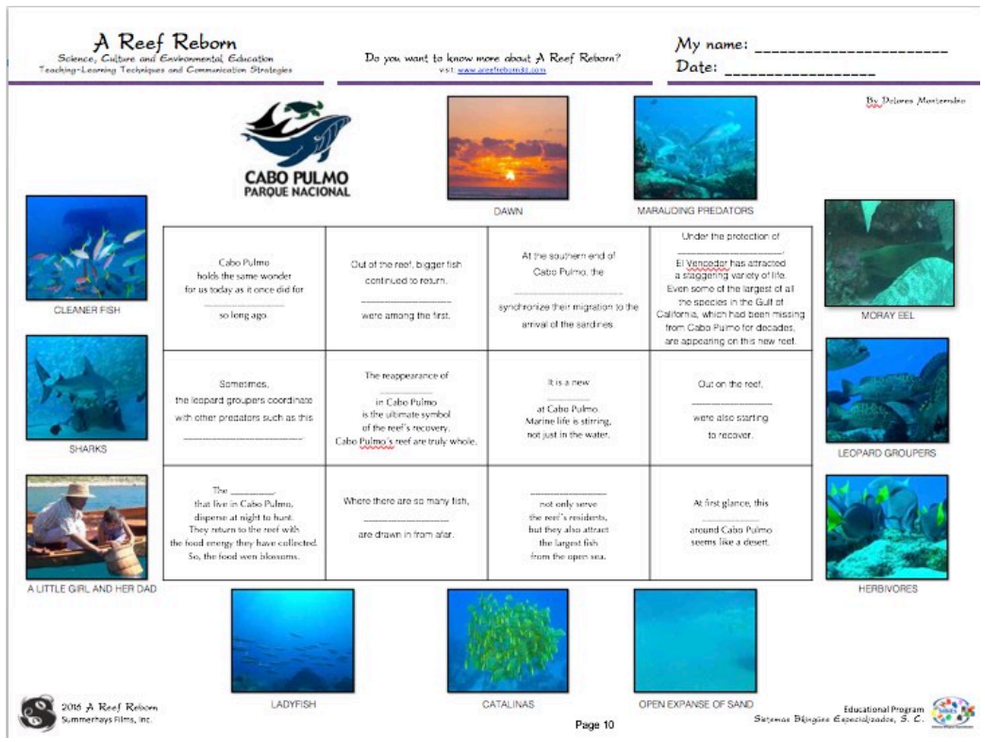
Page 9

Educational Program
Sistemas Bilingües Especializados, S. C.


A Reef Reborn
Science, Culture and Environmental Education
Teaching-Learning Techniques and Communication Strategies

Do you want to know more about A Reef Reborn?
visit: www.areefreborn3d.com

My name: _____
Date: _____

By Dolores Monterrubio

CABO PULMO
PARQUE NACIONAL

DAWN | MARAUDING PREDATORS

CLEANER FISH

Cabo Pulmo holds the same wonder for us today as it once did for _____ so long ago.

Out of the reef, bigger fish continued to return. _____ were among the first.

At the southern end of Cabo Pulmo, the _____ synchronize their migration to the arrival of the sardines.

Under the protection of _____ El Vencedor has attracted a staggering variety of life. Even some of the largest of all the species in the Gulf of California, which had been missing from Cabo Pulmo for decades, are appearing on this new reef.

MORAY EEL

SHARKS

Sometimes, the leopard groupers coordinate with other predators such as this _____.

The reappearance of _____ in Cabo Pulmo is the ultimate symbol of the reef's recovery. Cabo Pulmo's reef are truly whole.

It is a new _____ at Cabo Pulmo. Marine life is stirring, not just in the water.

Out on the reef, _____ were also starting to recover.

LEOPARD GROUPERS

A LITTLE GIRL AND HER DAD

The _____ that live in Cabo Pulmo, disperse at night to hunt. They return to the reef with the food energy they have collected. So, the food web blossoms.

Where there are so many fish, _____ are drawn in from afar.

_____ not only serve the reef's residents, but they also attract the largest fish from the open sea.

At first glance, this _____ around Cabo Pulmo seems like a desert.

HERBIVORES

LADYFISH | CATALINAS | OPEN EXPANSE OF SAND

2016 A Reef Reborn
Summerhays Films, Inc.

Page 10

Educational Program
Sistemas Bilingües Especializados, S. C.

Suggestions for the activity

Materials

✓ Print enough copies so that every participant has one worksheet (there are two different).

Objective

o To remember and reinforce the information in A Reef Reborn and for the participants to take a souvenir home.

Ideas

We can give the worksheets **before** watching A Reef Reborn and spend a few minutes reading the texts and describing the pictures. Maybe, without watching the film, students can match some of the texts and pictures and talk about what they know.

We can make a pause in A Reef Reborn, **after** the part of the moray eel, and see how much information we can match with the cards.

We can give the worksheets **at the end** of A Reef Reborn to comment and remember different topics.

Depending on our audience, we can ask them to formulate **four** types of questions:

1. **Yes-No** questions: Do trevally hunt in the reefs during the day? (No, they disperse to hunt away from the reefs at night.)
2. Questions with **options**: Do leopard groupers coordinate to eat the *chromis* with a shark or a moray eel? (With a moray eel.)
3. **Open** questions: Where do algae get their energy from? (Directly from the sun.)
4. **What if** questions: **What would happen if** sardines never came back to Cabo Pulmo? Answers will vary depending on our audience.

By Dolores Monterrubio

TURTLES

HIDING PLACES

NEWLY HATCHED TURTLES

CABO PULMO

_____ are the most productive and diverse marine ecosystems. They are like the forests or the jungles in our planet.	The reefs today teem with life, like these _____. They gather here during the day for refuge and a place to breed. At night they disperse to hunt away from the reefs.	It is time for these _____ to find their way in the world. Some will return as adults to this same beach.	As the _____ started to recover, more fish were able to reap the sardine harvest.
Giants such as _____ and _____ thrive here now. This reef has become a food basket big enough even for these huge eaters.	In fact, a host of _____ lives below the sand and provides food for resident animals who import that energy into Cabo Pulmo´s food web.	_____ harvest energy directly from sunlight. Herbivores eat the _____ and capture that energy. Herbivore numbers grow and so does their size.	The diversity of El Vencedor´s _____ invites cleaner fish.
The diversity of El Vencedor´s _____ invites cleaner fish.	The prey of the leopard groupers is small fish like these _____ which had become abundant in the absence of predators.	Every year, one of the most spectacular migrations in this sea passes Cabo Pulmo: _____.	Nature is indomitable. It is irrepressible. When we humans give it a chance, it can heal itself and it can heal us, too. _____ has come back to its beginnings.

TREVALLY

GULF GROUPERS and
DOG SNAPPERS

CHROMIS

REEF

ALGAE

SARDINES

SMALL CREATURES

CORAL REEFS

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A Reef Reborn

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My name: _____
Date: _____

By Dolores Monterrubio

CABO PULMO
PARQUE NACIONAL

DAWN

MARAUDING PREDATORS

CLEANER FISH

Cabo Pulmo holds the same wonder for us today as it once did for _____ so long ago.	Out of the reef, bigger fish continued to return. _____ were among the first.	At the southern end of Cabo Pulmo, the _____ synchronize their migration to the arrival of the sardines.	Under the protection of _____, El Vencedor has attracted a staggering variety of life. Even some of the largest of all the species in the Gulf of California, which had been missing from Cabo Pulmo for decades, are appearing on this new reef.
Sometimes, the leopard groupers coordinate with other predators such as this _____.	The reappearance of _____ in Cabo Pulmo is the ultimate symbol of the reef´s recovery. Cabo Pulmo´s reef are truly whole.	It is a new _____ at Cabo Pulmo. Marine life is stirring, not just in the water.	Out on the reef, _____ were also starting to recover.
The _____, that live in Cabo Pulmo, disperse at night to hunt. They return to the reef with the food energy they have collected. So, the food wen blossoms.	Where there are so many fish, _____ are drawn in from afar.	_____ not only serve the reef´s residents, but they also attract the largest fish from the open sea.	At first glance, this _____ around Cabo Pulmo seems like a desert.

SHARKS

MORAY EEL

LEOPARD GROUPERS

A LITTLE GIRL AND HER DAD

HERBIVORES

LADYFISH

CATALINAS

OPEN EXPANSE OF SAND

2016 A Reef Reborn
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Vocabulary in A Reef Reborn

In the Educational Program A Reef Reborn we will listen to words with which we can create an exercise to develop and practice communication skills in our classrooms.

It is important to know the meaning of these words and to be able to define, give examples and even write an essay with one and/or the combination of these words.

Each word might remind each person of a very different moment in A Reef Reborn. We can learn a lot from our students if we give ourselves time to listen to what it is important and special for everyone.

It is also very important to encourage our students to use their dictionaries to find definitions, examples and similar and opposite words (synonyms and antonyms).

abundance	amazement	awareness	conservation
cooperation	choice	effort	hope
success	happiness	inspiration	opportunity
participation	protection	recovery	shelter
rebirth	resilience	revival	livelihood
survival	treasure	triumph	bravery

Page 12

abound	amaze	create awareness	conserve
cooperate	make a choice	make an effort	have hope
be successful	be happy	inspire	have or give opportunity
participate	protect	recover	take or seek shelter
be reborn	be resilient	revive	survive
outlast	treasure	triumph	be brave

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Do you want to know more about A Reef Reborn?
visit: www.areefreborn3d.com

Suggestions for the activity

Materials

- ✓ Print the page of blue words (nouns) and the page of red words (verbs).

Objective

- o Work with some words that we might hear in A Reef Reborn.

Ideas

There are many ways in which we can use these cards.

We can select a few words to communicate them through pictures, mime, definitions or examples in an incomplete sentence.

I am sure that every time we practice an activity with different groups, we learn what works, what we can improve, in what other ways we can use these cards and these words and more.

If it is not possible to print these cards, we can use some for dictation and do this activity on the board.

This, as well as all the other activities that we suggest, can be adapted to our different students and audiences.

abundance	amazement	awareness	conservation
cooperation	choice	effort	hope
success	happiness	inspiration	opportunity
participation	protection	recovery	shelter
rebirth	resilience	revival	livelihood
survival	treasure	triumph	bravery

abound	amaze	create awareness	conserve
cooperate	make a choice	make an effort	have hope
be successful	be happy	inspire	have or give opportunity
participate	protect	recover	take or seek shelter
be reborn	be resilient	revive	survive
outlast	treasure	triumph	be brave

Fish around the Espiritu Santo Island

The Espíritu Santo Archipelago National Park and the Cabo Pulmo National Park have similar flora and fauna. Many of the fish that are found around the Island of Espíritu Santo are present in A Reef Reborn. This poster, with original drawings by **Juan Chuy Lucero**, that the *Sociedad de Historia Natural NIPARAJÁ* has allowed us to include in our educational program, is a great tool for a fun activity to **identify**, **compare**, **describe** and **learn** the names of the fish and much more.

If you want to learn more about Parque Nacional Archipielago Isla Espíritu Santo, visit: http://pnaes.conanp.gob.mx

If you want to learn more about NIPARAJA visit: http://niparaja.org visit: http://niparaja.org/file/2015/11/25-logros-de-Niparaja.pdf

Suggestion for the activity

Materials

- ✓ The poster of the fish around the Espiritu Santo Island by the *Sociedad de Historia Natural* **NIPARAJÁ.**

SUGGESTIONS:

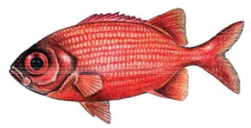
1) Ask the participants to describe some of these fish so that everyone else can find them on the poster. Ask them to observe colors, marks, shapes, the position of the fins, etc.
2) If you have two posters, you can cut the silhouette of every fish and hand one fish to each participant and ask them to look for their fish while they watch A Reef Reborn.
3) Depending on our audience, we could ask to pay special attention to the information in A Reef Reborn about fish. For example, where do they live? what do they eat and what eats them? how do they get their food? what relation do they have with other organisms, etc.
4) During the **Symposium 20 years of research and management for the conservation of Cabo Pulmo National Park,** I cut every fish in two, three or four parts and I handed a piece to the participants that came to watch A Reef Reborn. Of course, scientists, expert on fish, were able to identify them all, and give their scientific names, only by looking at a fin, or a little piece of the head or the body. They even told me that I should cut smaller pieces because, in reality, that is how they have to identify them in the sea. It was a great experience!

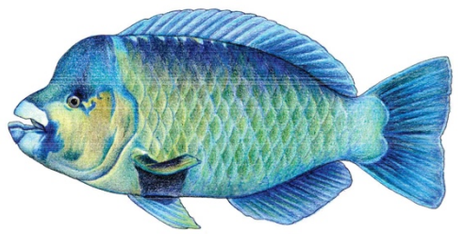
By Dolores Monterrubio

PECES DE LA ISLA ESPÍRITU SANTO

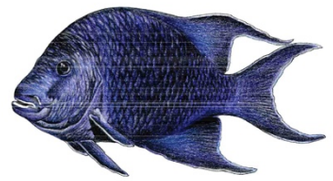
GOLFO DE CALIFORNIA, MÉXICO

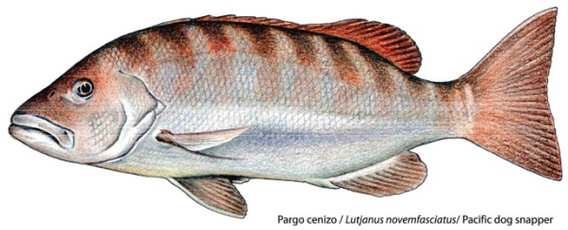
Vieja / *Bodianus diplotaenia* / Mexican hogfish


Soldado/ *Myripristis leiognathus* / Panamic soldierfish

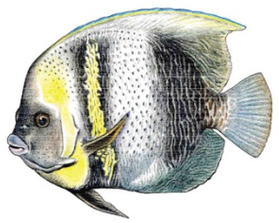

Perico boludo/ *Scarus perrico* / Bumphead parrotfish

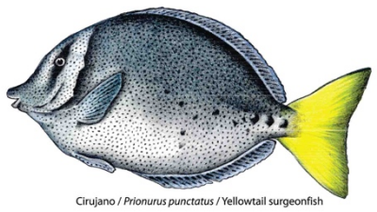
Barbero / *Holacanthus passer* / King angelfish

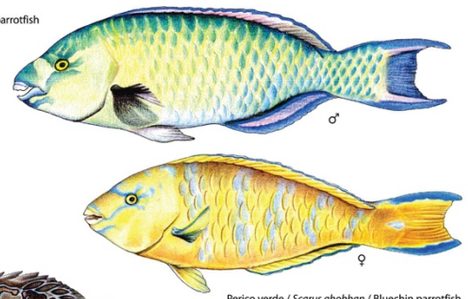

Brujita / *Microspathodon dorsalis* / Giant damselfish

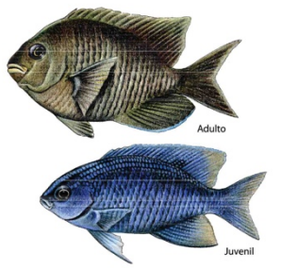

Pargo cenizo / *Lutjanus novemfasciatus*/ Pacific dog snapper

Señorita / *Halichoeres nicholsi* / Spinster wrasse

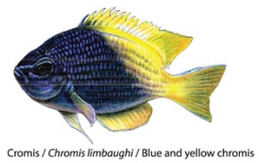

Ángel de Cortés / *Pomacanthus zonipectus* / Cortez angelfish


Cirujano / *Prionurus punctatus* / Yellowtail surgeonfish

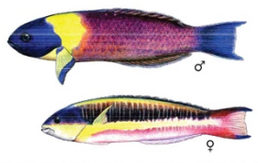

Perico verde / *Scarus ghobban* / Bluechin parrotfish

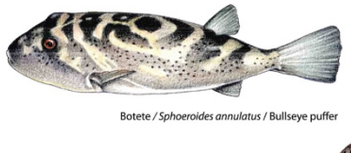

Adulto
Juvenil
Damisela / *Stegastes rectifraenum* / Cortez damselfish

Halcón de coral / *Cirrhitichthys oxycephalus* / Coral hawkfish

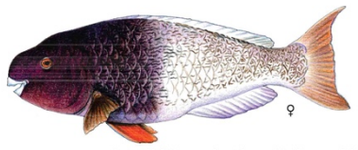

Cromis / *Chromis limbaughi* / Blue and yellow chromis

Cola de tijera / *Chromis atrilobata* / Scissortail damselfish

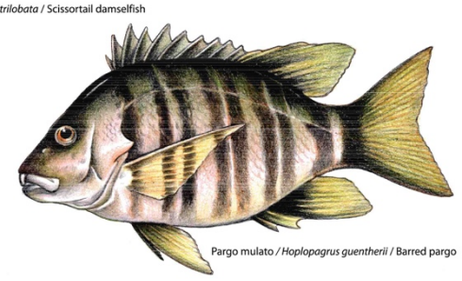

Arcoíris común / *Thalassoma lucasanum* / Cortez rainbow wrasse

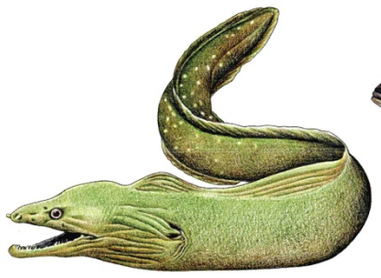

Botete / *Sphoeroides annulatus* / Bullseye puffer

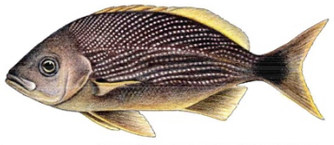
Mero chino / *Cirrhitus rivulatus* / Giant hawkfish

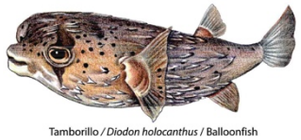

Perico dátil / *Scarus rubroviolaceus* / Bicolor parrotfish

Mulegino / *Abudefduf troschelii* / Panamic sergeant major

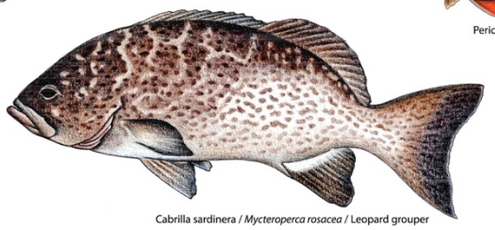

Pargo mulato / *Hoplopagrus guentherii* / Barred pargo

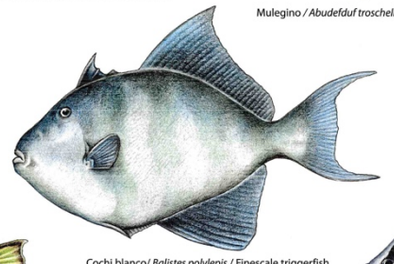

Morena verde / *Gymnothorax castaneus* / Panamic green moray


Guinea / *Haemulon maculicauda* / Spottail grunt


Tamborillo / *Diodon holocanthus* / Balloonfish

Botete pinto / *Arothron meleagris* / Guineafowl puffer

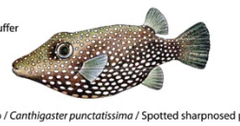

Cabrilla sardinera / *Mycteroperca rosacea* / Leopard grouper

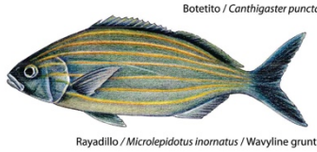

Cochi blanco/ *Balistes polylepis* / Finescale triggerfish

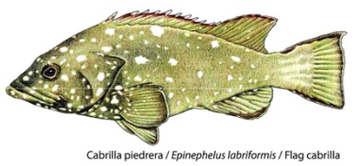
Pargo amarillo/ *Lutjanus argentiventris* / Yellow snapper

Ojotón/ *Ophioblennius steindachneri* / Panamic fanged blenny

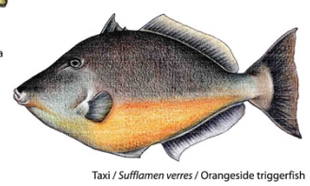
Morena cebra / *Gymnomuraena zebra* / Zebra moray

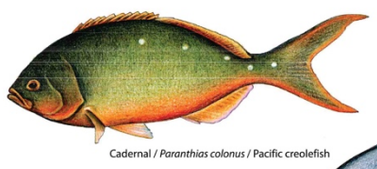

Botetito / *Canthigaster punctatissima* / Spotted sharpnosed puffer

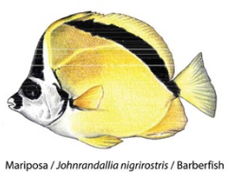

Rayadillo / *Microlepidotus inornatus* / Wavyline grunt

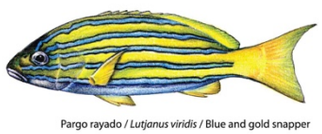

Cabrilla piedrera / *Epinephelus labriformis* / Flag cabrilla

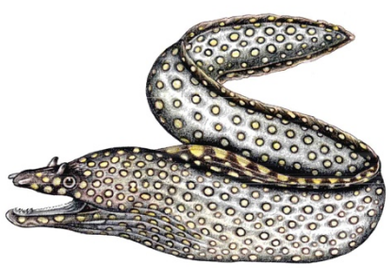
Mariposa gris / *Chaetodon humeralis* / Threebanded butterflyfish

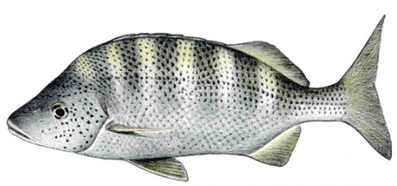

Taxi / *Sufflamen verres* / Orangeside triggerfish

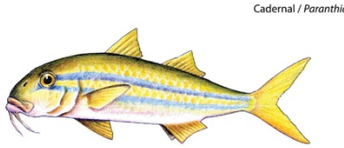

Cadernal / *Paranthias colonus* / Pacific creolefish

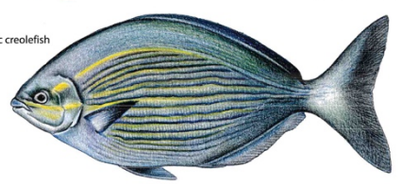

Mariposa / *Johnrandallia nigrirostris* / Barberfish

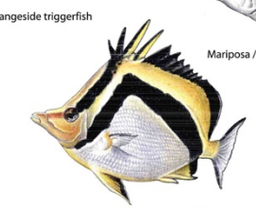

Pargo rayado / *Lutjanus viridis* / Blue and gold snapper


Morena pinta / *Muraena lentiginosa* / Jewel moray


Bacoco verde / *Haemulon sexfasciatum* / Graybar grunt


Chivato / *Mulloidichthys dentatus* / Mexican goatfish


Chopa / *Kyphosus elegans* / Cortez chub


Mariposa guadaña / *Prognathodes falcifer* / Scythemarked butterflyfish

Lupón / *Scorpaena plumieri mystes* / Stone scorpionfish

Juan Chuy, 08

Parque Nacional Archipiélago de Espíritu Santo, Baja California Sur, México. Comisión Nacional de Áreas Naturales Protegidas. **Dibujos originales:** Juan Chuy Lucero. **Diseño y producción:** Sociedad de Historia Natural Niparajá, A.C. Derechos Reservados © **2008**

CONANP
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Environmental Education

Basic Objectives

UNESCO

UNEP

A Reef Reborn

Environmental Science, Culture and Education

Teaching-Learning Techniques and Communication Strategies

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Summerhays Films. Inc.

By Dolores Monterrubio Alvarez

Educational Program
Sistemas Bilingües Especializados, S. C.

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History

In October 1977, at the first

Intergovernmental Conference on Education

carried out by the

United Nations Educational,

Scientific and Cultural Organization,

in collaboration with the

United Nations Environmental Programme,

in Tbilisi, now Republic of Georgia,

6 Basic Objectives

for environmental education

were defined.

United Nations
Educational, Scientific and
Cultural Organization

World
Heritage
Centre

1

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I know that
I am part of nature
and my local actions
have
a global impact.

Awareness

To help social groups and individuals
acquire an awareness and sensitivity
to the total environment and its allied problems.

United Nations
Educational, Scientific and
Cultural Organization

UNEP
United Nations
Environment Programme

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2

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I find information
so that I can
make better choices.
I learn to preserve,
enjoy and protect
our natural resources.

Knowledge

To help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.

United Nations
Educational, Scientific and
Cultural Organization

UNEP
United Nations
Environment Programme

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3

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I can do something,
here and now
for the environment
and with my family
we can do
more.

Attitude

To help social groups and individuals acquire
a set of values and feelings of concern for the
environment and the motivation for actively participating
in environmental improvement and protection.

United Nations
Educational, Scientific and
Cultural Organization

UNEP
United Nations
Environment Programme

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4

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I set myself a goal.
I acknowledge my talents
and my skills.
I do my best and I work hard
to achieve my objective.

Skills

To help social groups and individuals
acquire skills for identifying
and solving environmental problems.

United Nations
Educational, Scientific and
Cultural Organization

UNEP
United Nations
Environment Programme

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5

Together we can do much.
We learn from each other,
we do our best and
participate in Harmony.

Participation

To provide social groups and individuals
with an opportunity to be actively involved at all levels
in working toward resolution of environmental problems.

United Nations
Educational, Scientific and
Cultural Organization

UNEP
United Nations
Environment Programme

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6

We register, report and share our knowledge, experiences and results.

Evaluation

To help social groups and individuals to evaluate measures and environmental education projects on the basis of ecological, political, social, aesthetic and educational factors.

United Nations Educational, Scientific and Cultural Organization

UNEP United Nations Environment Programme

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AWARENESS

EVALUATION

KNOWLEDGE

Environmental Education

Basic Objectives

PARTICIPATION

ATTITUDE

SKILLS

A Reef Reborn

Environmental Science, Culture and Education

Teaching-Learning Techniques and Communication Strategies

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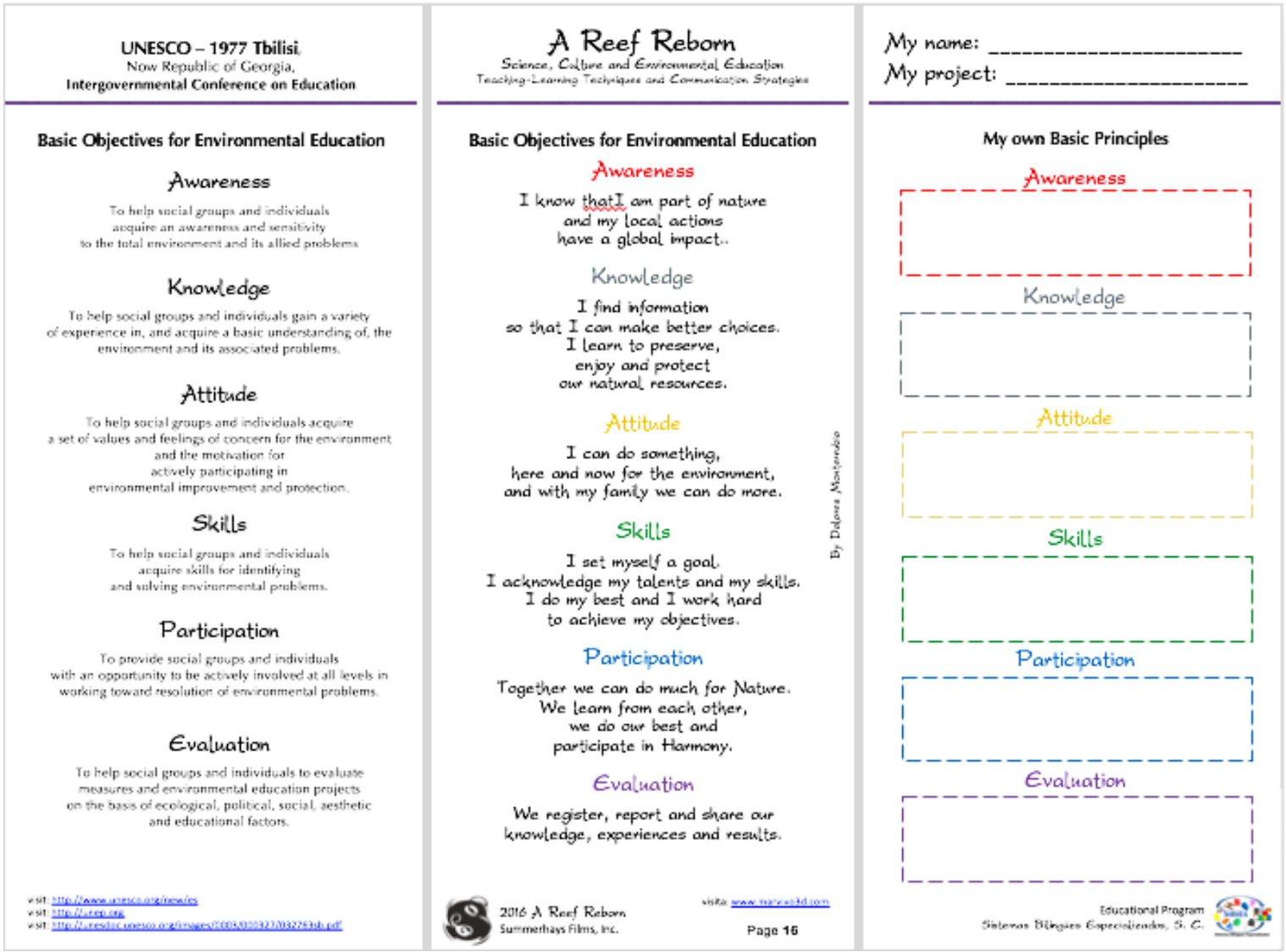
UNESCO and A Reef Reborn Basic Objectives

When a place is accepted in the **UNESCO World Heritage List** it is **our responsibility to conserve it.**

What is Environmental Education?

When can we say that we are environmentally educated?

In the story of **20 years** of **SUCCESS** in **CONSERVATION** of **CABO PULMO**, we can see how these objectives were covered in different moments and how the circle was completed at the Symposium, where **scientists**, **members** of **communities** and **NGOs**, **government authorities** and **educators** shared with us their **discoveries**, **experiences** and **results**.



UNESCO – 1977 Tbilisi
Now Republic of Georgia,
Intergovernmental Conference on Education

Basic Objectives for Environmental Education

Awareness

To help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems

Knowledge

To help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.

Attitude

To help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.

Skills

To help social groups and individuals acquire skills for identifying and solving environmental problems.

Participation

To provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

Evaluation

To help social groups and individuals to evaluate measures and environmental education projects on the basis of ecological, political, social, aesthetic and educational factors.

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visit: http://unep.org
visit: http://unesdoc.unesco.org/images/0009/000927/092763sb.pdf

A Reef Reborn
Science, Culture and Environmental Education
Teaching-Learning Techniques and Communication Strategies

Basic Objectives for Environmental Education

Awareness

I know that I am part of nature
and my local actions
have a global impact..

Knowledge

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so that I can make better choices.
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enjoy and protect
our natural resources.

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I can do something,
here and now for the environment,
and with my family we can do more.

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I set myself a goal.
I acknowledge my talents and my skills.
I do my best and I work hard
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We learn from each other,
we do our best and
participate in Harmony.

Evaluation

We register, report and share our
knowledge, experiences and results.

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Page 16

My name: _____
My project: _____

My own Basic Principles

Awareness

Knowledge

Attitude

Skills

Participation

Evaluation

Educational Program
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Suggestion for the activity

Materials

- ✓ Print a worksheet for each participant.

Objective

- Remember and analyze each of the Objectives for Environmental Education by the UNESCO and talk about their importance and relation with what happened in A Reef Reborn.
- Share with our audience a way in which we can personalize each one of these Objectives so that we can adopt them in our lives.
- We can use these Objectives to start our own projects.
- Discuss the consequences of starting something without well-defined Objectives.

Idea

The projects can be as simple and as big as we want them to be. Examples:

- Keep our classrooms clean.
- Use less paper, save energy and water.
- Clean and maintain our school yard clean.
- Learn and adopt healthier habits.
- Plant one, two, three or more trees and take care of them.

If it is not possible to print the worksheet, we can write our own Objectives on the board or in our notebooks, in pairs, teams of with the whole class.

UNESCO – 1977 Tbilisi,
Now Republic of Georgia,
Intergovernmental Conference on Education

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and educational factors.

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visit: http://unep.org
visit: http://unesdoc.unesco.org/images/0003/000327/032763sb.pdf

A Reef Reborn

Science, Culture and Environmental Education
Teaching-Learning Techniques and Communication Strategies

Basic Objectives for Environmental Education

Awareness

I know that I am part of nature
and my local actions
have a global impact..

Knowledge

I find information
so that I can make better choices.
I learn to preserve,
enjoy and protect
our natural resources.

Attitude

I can do something,
here and now for the environment,
and with my family we can do more.

Skills

I set myself a goal.
I acknowledge my talents and my skills.
I do my best and I work hard
to achieve my objectives.

Participation

Together we can do much for Nature.
We learn from each other,
we do our best and
participate in Harmony.

Evaluation

We register, report and share our
knowledge, experiences and results.

By Dolores Monterrubio

2016 A Reef Reborn
Summerhays Films, Inc.

visita: www.marvivo3d.com

My name: _____
My project: _____

My own Basic Principles

Awareness

Knowledge

Attitude

Skills

Participation

Evaluation

Educational Program
Sistemas Bilingües Especializados, S. C.

CONANP
Comisión Nacional de Áreas Naturales Protegidas

PATRIMONIO MUNDIAL · WORLD HERITAGE · PATRIMOINE MONDIAL

MÉXICO

World Heritage

UNESCO

1987

Sian Ka´an Reserve
Quintana Roo
criteria vii-x

1993

Whale Sanctuary El Vizcaíno,
Baja California
criteria x

2002

Ancient Maya City and
Protected Tropical Forests
of Calakmul, Campeche
criteria i-ii-iii-iv

2005

Islands and Protected Areas of
the Gulf of California
criteria vii-ix-x

2008

Monarch Butterfly Biosphere
Reserve, Michoacán
criteria vii

2013

El Pinacate and Grand Desierto de
Altar Biosphere Reserve, Sonora
criteria vii-viii-x

UNESCO

UNEP

A Reef Reborn

Science, Culture and Environmental Education

Teaching-Learning Techniques and Communication Strategies

Visit: es.unesco.org Visit: http://www.unesco.org/new/es/mexico/work-areas/culture/world-heritage/ Visit: www.areefreborn3d.com Visit: http://pncabopulmo.conanp.gob.mx

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Educational Program
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History

The Convention for the Protection of the World Cultural and Natural Heritage of 1972 emerged because of the need to identify the priceless and unique assets of the nations. The loss of any of these sites would represent an irreplaceable loss for humankind.

It is after the adoption of the convention, when the international community begins to talk about "sustainable development" because the conservation of Natural and Cultural Heritage constitutes a relevant contribution to the development of the site and, therefore, its environment.

The World Heritage List of UNESCO is a legacy of monuments and sites of great cultural and natural wealth that belongs to all mankind. The sites inscribed in the World Heritage List fulfill an important roll as landmarks on the planet, symbols of awareness of the States and the towns regarding the sense of those places and symbol of loyalty to the collective property, as well as the transmission of this heritage to future generations.

For all the above, and because the monuments and sites are also places of sustainable development and reconciliation, the UNESCO actively intervenes and coordinates the actions of its partners by administering the Convention for the Protection of the World Cultural and Natural Heritage (1972).

Translated from the *Oficina de la UNESCO en México* Website: http://www.unesco.org/new/es/mexico/work-areas/culture/world-heritage

UNESCO
World Heritage List

As of July of 2015, The World Heritage List contains a total of:

1031 sites:

802 cultural,

197 natural and

32 mixed, in

163 States Parties.

Each site is considered in the interest of the international community and must be preserved for future generations.

Protection and conservation of these sites are a concern of the 193 Member States of the UNESCO.

México
on the World Heritage List

México has: **33** sites inscribed on the List:

27 **cultural** sites, **5** **natural** sites and **1** **mixed** site.

1987
Sian Ka´an Reserve
Quintana Roo
criteria vii-x

1993
Whale Sanctuary El Vizcaíno,
Baja California
criteria x

2002
Ancient Maya City and
Protected Tropical Forests
of Calakmul, Campeche
criteria i-ii-iii-iv

2005
Islands and Protected Areas of
the Gulf of California
criteria vii-ix-x

2008
Monarch Butterfly Biosphere
Reserve, Michoacán
criteria vii

2013
El Pinacate and Grand Desierto de Altar
Biosphere Reserve, Sonora
criteria vii-viii-x

México is the Latin American country with the most sites on the List, and the **6o** country in the world, after:

Italy. China. Spain. France and Germany.

UNESCO
World Heritage List

To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria.

i To represent a masterpiece of human creative genius.

ii To exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design.

iii To bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared.

iv To be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history.

v To be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change.

vi To be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria).

vii To contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.

viii To be outstanding examples representing major stages of earth´s history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.

ix To be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.

x To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

United Nations Educational, Scientific and Cultural Organization

World Heritage Convention

2005

Islands and Protected Areas of the Gulf of California

criteria vii-ix-x

vii To contain superlative natural phenomena or areas of exceptional beauty and aesthetic importance.

ix To be outstanding examples representing major stages of earth´s history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.

x To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

México

World Heritage List

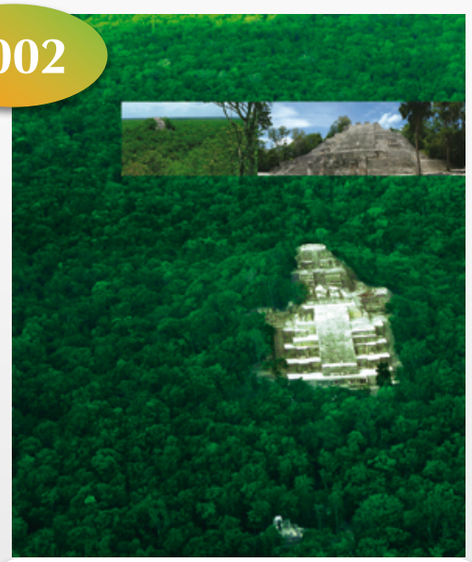
1987

Sian Ka´an,
Quintana Roo
criteria vii-x

1993

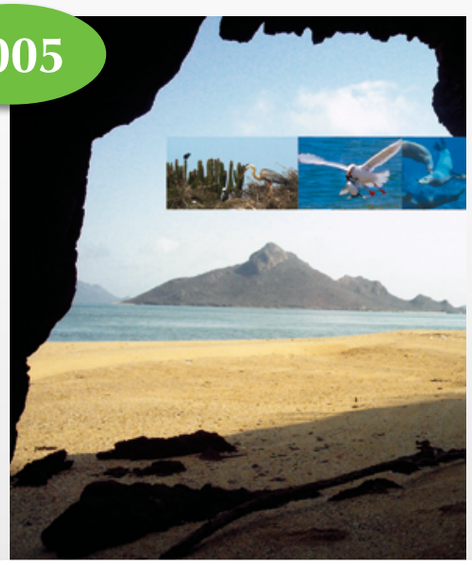
Whale Sanctuary
El Vizcaíno, Baja California
criteria x

2002



Ancient Maya City and Protected
Tropical Forests
of Calakmul, Campeche
criteria i-ii-iii-iv

2005



Islands and Protected Areas of
the Gulf of California
criteria vii-ix-x

2008

Monarch Butterfly Biosphere Reserve,
Michoacán
criteria vii

2013

El Pinacate and Grand Desierto de Altar
Biosphere Reserve, Sonora
criteria vii-viii-x

Introducción al tema de ARRECIFES CORALINOS

Los **OCÉANOS, MARES** y **GOLFOS** ...

... cubren el **71%** de la superficie de la Tierra.

... ofrecen **hábitats** para más de **1 millón** de especies conocidas de **plantas** y **animales** marinos.

... producen **alimento** para muchos **organismos** incluyendo a los **seres humanos**.

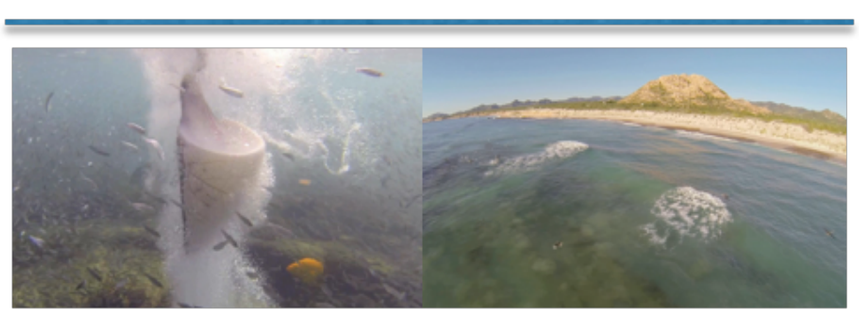


Foto: 2016 Mar Vivo

ECOSISTEMAS MARINOS

altamente productivos

- Arrecifes de coral
- Esteros
- Humedales
- Isla barrera
- Manglares
- Pastos marinos

La **ZONA COSTERA** ...

... representa la **transición** de la tierra al mar.

... comprende las **aguas costeras** y las **orillas adyacentes** las cuales tienen gran **influencia** entre **sí**.

... incluye **islas**, la zona **inter-mareal** y de **transición**, **esteros**, **marismas** o **pantanos**, **humedales** y **playas**.

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visit: www.areefreborn3d.com

Otros materiales

Arrecifes Coralinos

Contenido:

1. Introducción
2. Los arrecifes coralinos en México y en el Mundo.
3. Servicios ambientales
4. Los corales

Fuente:	SOMAC, A. C.
Agradecimiento especial:	Dr. Pedro Medina Rosas
Enlace a Página Web:	www.somac.org.mx

Los arrecifes coralinos en México y el mundo

Mar Vivo

Ciencia, Educación y Cultura Ambiental

Técnicas de Enseñanza-Aprendizaje y Estrategias de Comunicación

Los arrecifes coralinos en México y en el Mundo

La Sociedad Mexicana de Arrecifes Coralinos presenta:

En México, existen 3 áreas donde científicos mexicanos y de todo el mundo realizan investigaciones enfocadas en los arrecifes de coral.

- Las costas del Océano Pacífico y el Golfo de California
- El Golfo de México
- El Mar Caribe

Los arrecifes de coral son uno de los ecosistemas marinos de México.

17 estados de nuestro país se ubican frente al mar y en 14 de ellos podemos encontrar coral.

En México los corales viven en las costas de:

- Sonora
- Sinaloa
- Nayarit
- Colima
- Jalisco
- Michoacán
- Guerrero
- Oaxaca
- Veracruz
- Campeche
- Península de Baja California
  - Baja California
  - Baja California Sur
- Península de Yucatán
  - Yucatán
  - Quintana Roo

Algunos de los arrecifes de coral más conocidos de México son:

- Cancun
- Cozumel
- Banco Chinchorro
- Reserva de Sian Ka´an
- Sistema Arrecifal Veracruzano SAV
- Cabo Pulmo
- Archipiélago de Revillagigedo
- Islas Marietas
- Isla Isabel
- Arrecife Alacranes
- Banco de Campeche
- Xcalak
- Puerto Morelos

Los corales son parte muy importante de la biodiversidad de las zonas costeras tropicales del planeta.
El arrecife de coral más grande del mundo es el arrecife de la Gran Barrera en Australia.

El más importante de América se llama Arrecife Mesoamericano. Tiene más de 1,000 kilómetros de largo y es una impresionante formación de corales que se extiende desde México hasta Honduras, pasando por Belice y Guatemala.

Sociedad Mexicana de Arrecifes Coralinos, A. C.

El mar me enseña. Somos vida. Arrecifes coralinos.

El mar me enseña. Somos vida. Arrecifes Coralinos.

Agradecemos a la **Sociedad Mexicana de Arrecifes Coralinos, A. C.**, y **especialmente** al **dr. Pedro Medina Rosas**, por su asesoría y apoyo para la realización de esta actividad

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Elaborado por Dolores Monterrubio Alvarez

Sistemas Bilingües Especializados, S. C.

Mar Vivo

Ciencia, Educación y Cultura Ambiental

Técnicas de Enseñanza-Aprendizaje y Estrategias de Comunicación

Servicios Ambientales

La Sociedad Mexicana de Arrecifes Coralinos presenta:

Los servicios ambientales son los **beneficios** que obtenemos de todos los recursos naturales.

Algunos de los beneficios ambientales que obtenemos de los arrecifes de coral son:

Protección:

Previenen el desgaste del fondo marino,
Nos protegen del fuerte impacto de las olas, especialmente durante tormentas y huracanes,
Incluso, los arrecifes coralinos ayudan a reducir la cantidad de gases efecto invernadero que van a la atmósfera.

Medicina:

El esqueleto de los corales está formado por carbonato de calcio. El carbonato de calcio es un mineral que se utiliza en la medicina humana y se aplica para regenerar los huesos.

Inspiración:

Los arrecifes de coral son sitios turísticos muy atractivos para toda clase de visitantes, especialmente para los buzos ya que pueden disfrutar de un impresionante acuario natural.

Alimento:

Una gran parte de los productos pesqueros que consumimos del mar está relacionada con los corales porque los arrecifes funcionan como refugio para peces como el mero, el pargo, también para los cangrejos, langostas, pulpos y caracoles.

Sociedad Mexicana de Arrecifes Coralinos, A. C.

El mar me enseña.
Somos vida.
Arrecifes coralinos.

Los arrecifes de coral son ecosistemas que nos dan riqueza, alimento, medicina, inspiración y protección.

El mar me enseña. Somos vida. Arrecifes Coralinos.

Agradecemos a la **Sociedad Mexicana de Arrecifes Coralinos, A. C.**, y **especialmente** al **dr. Pedro Medina Rosas**, por su asesoría y apoyo para la realización de esta actividad visita: www.somac.org.mx

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Ciencia, Educación y Cultura Ambiental

Técnicas de Enseñanza-Aprendizaje y Estrategias de Comunicación

Los corales

La Sociedad Mexicana de Arrecifes Coralinos presenta:

Los corales son animales de los mares tropicales. Son muy pequeños y forman las colonias submarinas llamadas arrecifes coralinos o arrecifes de coral.

Los corales son animales primitivos que han evolucionado durante millones de años.

Durante todo este tiempo, han construido los impresionantes arrecifes que hoy existen en diferentes partes del planeta.

En promedio, los corales crecen 1 centímetro al año. Su esqueleto está hecho de carbonato de calcio – un compuesto similar al que existe en nuestros huesos.

Los arrecifes de coral son los ecosistemas marinos más productivos y diversos del planeta. Son como los bosques o las selvas del mar.

Su paisaje está lleno de color y vida.

Podemos encontrar arrecifes de coral en aguas cálidas y de baja profundidad.

Bajo el agua, los corales se ven rosas, amarillos, rojos. Unos parecen abanicos. Otros cerebros gigantes y otros parecen árboles pequeños o racimos de flores exóticas.

Pero no hay que confundirse. Un coral es un animal.

Para que cada coral del arrecife pueda desarrollarse, debe tener en su interior una diminuta alga llamada zooxantela.

Ambos, son el mejor ejemplo del trabajo en equipo que existe en la naturaleza, donde las algas aportan el oxígeno, el coral aporta los nutrientes y un lugar para vivir.

El mar nos enseña. Somos vida. Arrecifes Coralinos.

Sociedad Mexicana de Arrecifes Coralinos, A. C.

El mar me enseña.
Somos vida.
Arrecifes coralinos.

Agradecemos a la **Sociedad Mexicana de Arrecifes Coralinos, A. C.**, y **especialmente** al **dr. Pedro Medina Rosas**, por su asesoría y apoyo para la realización de esta actividad visita: www.somac.org.mx

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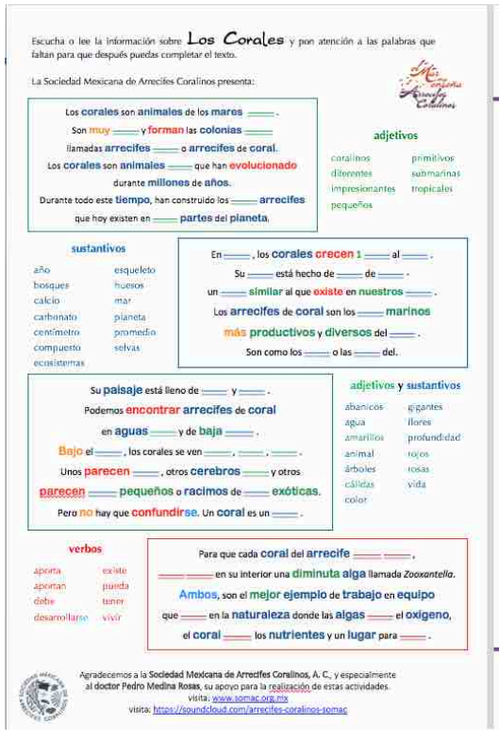
Folleto informativo y de actividades SOMAC y Mar Vivo


Escucha o lee la información sobre **Los Corales** y pon atención a las palabras que faltan para que después puedas completar el texto.

La Sociedad Mexicana de Arrecifes Coralinos presenta:

Los **corales** son **animales** de los **mares** ____.
Son **muy** ____ y **forman** las **colonias** ____
llamadas **arrecifes** ____ o **arrecifes de coral**.
Los **corales** son **animales** ____ que han **evolucionado**
durante **millones** de **años**.
Durante todo este **tiempo**, han construido los ____ **arrecifes**
que hoy existen en ____ **partes** del **planeta**.

adjetivos
coralinos · primitivos · diferentes · submarinas · impresionantes · tropicales · pequeños

sustantivos
año · esqueleto · bosques · huesos · calcio · mar · carbonato · planeta · centímetro · promedio · compuesto · selvas · ecosistemas

En ____, los **corales crecen** 1 ____ al ____.
Su ____ está hecho de ____ de ____.
un ____ **similar** al que **existe** en **nuestros** ____.
Los **arrecifes de coral** son los ____ **marinos**
más productivos y **diversos** del ____.
Son como los ____ o las ____ del.

Su **paisaje** está lleno de ____ y ____.
Podemos **encontrar arrecifes de coral**
en **aguas** ____ y de **baja** ____.
Bajo el ____, los corales se ven ____, ____, ____.
Unos **parecen** ____, otros **cerebros** ____ y otros
parecen ____ **pequeños** o **racimos** de ____ **exóticas**.
Pero **no** hay que **confundirse**. Un **coral** es un ____.

adjetivos y sustantivos
abanicos · gigantes · agua · flores · amarillos · profundidad · animal · rojos · árboles · rosas · cálidas · vida · color

verbos
aporta · existe · aportan · puede · debe · tener · desarrollarse · vivir

Para que cada **coral** del **arrecife** ____ ____,
____ ____ en su interior una **diminuta alga** llamada *Zooxantella*.
Ambos, son el **mejor ejemplo** de **trabajo** en **equipo**
que ____ en la **naturaleza** donde las **algas** ____ el **oxigeno**,
el **coral** ____ los **nutrientes** y un **lugar** para ____.

Agradecemos a la **Sociedad Mexicana de Arrecifes Coralinos, A. C.**, y especialmente al doctor **Pedro Medina Rosas**, su apoyo para la realización de estas actividades.
visita: www.somac.org.mx
visita: https://soundcloud.com/arrecifes-coralinos-somac

Mar Vivo

Una historia de resiliencia y conservación en el Golfo de California, México
Ciencia, Cultura y Educación Ambiental para el Siglo XXI
Técnicas de Enseñanza-Aprendizaje y Estrategias de Comunicación

Los OCÉANOS, MARES y GOLFOS ...

... cubren el **71%** de la superficie de la Tierra.
... ofrecen **hábitats** para más de **1 millón** de especies conocidas de **plantas** y **animales** marinos.
... producen **alimento** para muchos **organismos**, incluyendo a los **seres humanos**.

ECOSISTEMAS MARINOS altamente productivos

Arrecifes de coral
Esteros
Humedales
Islas barrera
Manglares
Pastos marinos
Bosques de algas

Resiliencia (del inglés *resilience*)
1) Capacidad de ser positivos, protegiendo nuestra integridad, aún bajo presión y ante dificultades y desgracias.
2) Capacidad de superar con éxito los obstáculos, y a pesar de las derrotas, aún cuando las circunstancias estén, o parezcan estar, en nuestra contra.

La ZONA COSTERA ...

... representa la **transición** de la tierra al mar.
... comprende las **aguas costeras** y las **orillas** adyacentes las cuales tienen gran **influencia** entre sí.
... incluye **islas**, la zona **intermareal** y de transición, **esteros**, **marismas** o pantanos, **humedales** y **playas**.

Elaborado por Dolores Monterrubio

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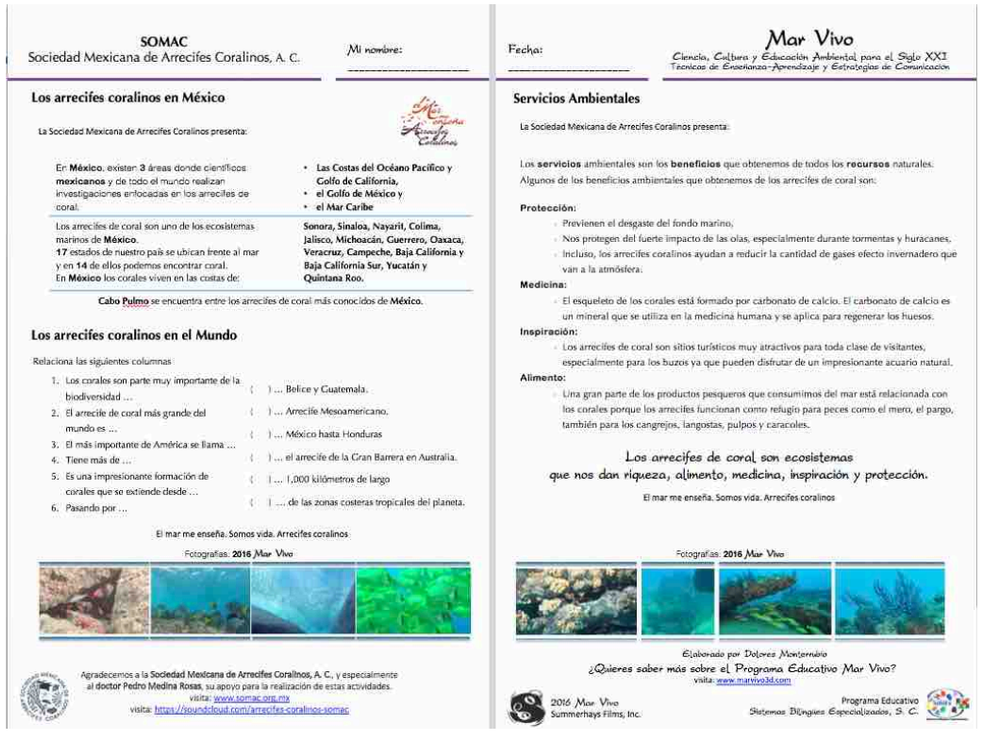
Programa Educativo Sistemas Bilingües Especializados, S. C.

- Los OCÉANOS, MARES y GOLFOS …
- Arrecifes coralinos en México
- Arrecifes coralinos en el Mundo
- Servicios ambientales
- Los corales


SOMAC
Sociedad Mexicana de Arrecifes Coralinos, A. C.

Mi nombre: _____

Los arrecifes coralinos en México

La Sociedad Mexicana de Arrecifes Coralinos presenta:

En **México**, existen **3** áreas donde científicos **mexicanos** y de todo el mundo realizan investigaciones enfocadas en los arrecifes de coral.

- **Las Costas del Océano Pacífico** y **Golfo de California**,
- **el Golfo de México** y
- **el Mar Caribe**

Los arrecifes de coral son uno de los ecosistemas marinos de **México**.
17 estados de nuestro país se ubican frente al mar y en **14** de ellos podemos encontrar coral.
En **México** los corales viven en las costas de:

Sonora, Sinaloa, Nayarit, Colima, Jalisco, Michoacán, Guerrero, Oaxaca, Veracruz, Campeche, Baja California y **Baja California Sur, Yucatán** y **Quintana Roo.**

Cabo Pulmo se encuentra entre los arrecifes de coral más conocidos de **México**.

Los arrecifes coralinos en el Mundo

Relaciona las siguientes columnas

1. Los corales son parte muy importante de la biodiversidad …
2. El arrecife de coral más grande del mundo es …
3. El más importante de América se llama …
4. Tiene más de …
5. Es una impresionante formación de corales que se extiende desde …
6. Pasando por …

( ) … Belice y Guatemala.
( ) … Arrecife Mesoamericano.
( ) … México hasta Honduras
( ) … el arrecife de la Gran Barrera en Australia.
( ) … 1,000 kilómetros de largo
( ) … de las zonas costeras tropicales del planeta.

El mar me enseña. Somos vida. Arrecifes coralinos

Fotografías: **2016** *Mar Vivo*

Agradecemos a la **Sociedad Mexicana de Arrecifes Coralinos, A. C.**, y especialmente al doctor **Pedro Medina Rosas**, su apoyo para la realización de estas actividades.
visita: www.somac.org.mx
visita: https://soundcloud.com/arrecifes-coralinos-somac

Fecha: _____

Mar Vivo
Ciencia, Cultura y Educación Ambiental para el Siglo XXI
Técnicas de Enseñanza-Aprendizaje y Estrategias de Comunicación

Servicios Ambientales

La Sociedad Mexicana de Arrecifes Coralinos presenta:

Los **servicios** ambientales son los **beneficios** que obtenemos de todos los **recursos** naturales.
Algunos de los beneficios ambientales que obtenemos de los arrecifes de coral son:

Protección:
- Previenen el desgaste del fondo marino,
- Nos protegen del fuerte impacto de las olas, especialmente durante tormentas y huracanes,
- Incluso, los arrecifes coralinos ayudan a reducir la cantidad de gases efecto invernadero que van a la atmósfera.

Medicina:
- El esqueleto de los corales está formado por carbonato de calcio. El carbonato de calcio es un mineral que se utiliza en la medicina humana y se aplica para regenerar los huesos.

Inspiración:
- Los arrecifes de coral son sitios turísticos muy atractivos para toda clase de visitantes, especialmente para los buzos ya que pueden disfrutar de un impresionante acuario natural.

Alimento:
- Una gran parte de los productos pesqueros que consumimos del mar está relacionada con los corales porque los arrecifes funcionan como refugio para peces como el mero, el pargo, también para los cangrejos, langostas, pulpos y caracoles.

Los arrecifes de coral son ecosistemas que nos dan riqueza, alimento, medicina, inspiración y protección.

El mar me enseña. Somos vida. Arrecifes coralinos

Fotografías: **2016** *Mar Vivo*

Elaborado por Dolores Monterrubio
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Programa Educativo Sistemas Bilingües Especializados, S. C.

- Lee, comenta y pregunta.
- Lee, escucha y responde.
- Aprende, define y usa las palabras nuevas.
- Observa la estructura de las dos partes de una oración y relaciona las columnas.
- Aprende y organiza la información.

Sugerencia para la actividad

Materiales

✓ Imprimir el folleto informativo y de actividades sobre Arrecifes Coralinos en una hoja por los dos lados.

Objetivo de la actividad

- Presentar este folleto como una posible idea para realizar nuestros propios folletos.

Idea

Entregar el folleto a nuestro grupo, leer la información, analizar las diferentes partes y realizar los ejercicios.

Hay seis diferentes partes en este folleto, sin contar las fotografías, los títulos, los nombres de las instituciones, enlaces y logotipos.

Si tenemos un proyecto especial, podemos elaborar en grupo nuestro propio folleto informativo y de actividades

Si no es posible imprimir esta hoja, podemos mostrarla en la computadora o con un proyector y trabajar en grupo.

Podemos tratar de contestar y completar las actividades con lo que ya sabemos y después comparar con lo que leemos en la presentación. Podemos leer la presentación y después hacer las actividades en el folleto informativo.

Elaborado por Dolores Monterrubio

Escucha o lee la información sobre **Los Corales** y pon atención a las palabras que faltan para que después puedas completar el texto.

La Sociedad Mexicana de Arrecifes Coralinos presenta:

Los **corales** son **animales** de los **mares** _____.
Son **muy** _____ y **forman** las **colonias** _____
llamadas **arrecifes** _____ o **arrecifes** de **coral**.
Los **corales** son **animales** _____ que han **evolucionado**
durante **millones** de **años**.
Durante todo este **tiempo**, han construido los _____ **arrecifes**
que hoy existen en _____ **partes** del **planeta**.

adjetivos

coralinos
diferentes
impresionantes
pequeños
primitivos
submarinas
tropicales

sustantivos

año
bosques
calcio
carbonato
centímetro
compuesto
ecosistemas
esqueleto
huesos
mar
planeta
promedio
selvas

En _____, los **corales crecen** 1 _____ al _____.
Su _____ está hecho de _____ de _____-
un _____ **similar** al que **existe** en **nuestros** _____.
Los **arrecifes** de **coral** son los _____ **marinos**
más productivos y **diversos** del _____.
Son como los _____ o las _____ del.

Su **paisaje** está lleno de _____ y _____.
Podemos **encontrar arrecifes** de **coral**
en **aguas** _____ y de **baja** _____.
Bajo el _____, los corales se ven _____, _____, _____.
Unos **parecen** _____, otros **cerebros** _____ y otros
parecen _____ **pequeños** o **racimos** de _____ **exóticas**.
Pero **no** hay que **confundirse**. Un **coral** es un _____.

adjetivos y sustantivos

abanicos
agua
amarillos
animal
árboles
cálidas
color
gigantes
flores
profundidad
rojos
rosas
vida

verbos

aporta
aportan
debe
desarrollarse
existe
pueda
tener
vivir

Para que cada **coral** del **arrecife** _____ _____,
_____ _____ en su interior una **diminuta alga** llamada *Zooxantella*.
Ambos, son el **mejor ejemplo** de **trabajo** en **equipo**
que _____ en la **naturaleza** donde las **algas** _____ el **oxígeno**,
el **coral** _____ los **nutrientes** y un **lugar** para _____.

Agradecemos a la **Sociedad Mexicana de Arrecifes Coralinos, A. C.**, y especialmente al **doctor Pedro Medina Rosas**, su apoyo para la realización de estas actividades.
visita: www.somac.org.mx
visita: https://soundcloud.com/arrecifes-coralinos-somac

Mar Vivo

Una historia de resiliencia y conservación en el Golfo de California, México

Ciencia, Cultura y Educación Ambiental para el Siglo XXI

Técnicas de Enseñanza-Aprendizaje y Estrategias de Comunicación

Los **OCÉANOS**, **MARES** y **GOLFOS** ...

... cubren el **71%** de la superficie de la Tierra.
... ofrecen **hábitats** para más de **1 millón** de especies conocidas de **plantas** y **animales** marinos.
... producen **alimento** para muchos **organismos**, incluyendo a los **seres humanos**.

ECOSISTEMAS MARINOS
altamente productivos

Arrecifes de coral
Esteros
Humedales
Islas barrera
Manglares
Pastos marinos
Bosques de algas

Resiliencia (del inglés *resilience*).
1) Capacidad de ser positivos, protegiendo nuestra integridad, aún bajo presión y ante dificultades y desgracias.
2) Capacidad de superar con éxito los obstáculos, y a pesar de las derrotas, aún cuando las circunstancias estén, o parezcan estar, en nuestra contra.

La **ZONA COSTERA** ...

... representa la **transición** de la tierra al mar.
... comprende las **aguas costeras** y las **orillas** adyacentes las cuales tienen gran **influencia** entre **sí**.
... incluye **islas**, la zona **intermareal** y de transición, **esteros**, **marismas** o pantanos, **humedales** y **playas**.

Elaborado por Dolores Monterrubio

2016 Mar Vivo
Summerhays Films, Inc.

Programa Educativo
Sistemas Bilingües Especializados, S. C.

SOMAC
Sociedad Mexicana de Arrecifes Coralinos, A. C.

Mi nombre: _____

Los arrecifes coralinos en México

La Sociedad Mexicana de Arrecifes Coralinos presenta:

En **México**, existen **3** áreas donde científicos **mexicanos** y de todo el mundo realizan investigaciones enfocadas en los arrecifes de coral:

- **Las Costas del Océano Pacífico y Golfo de California,**
- **el Golfo de México y**
- **el Mar Caribe**

Los arrecifes de coral son uno de los ecosistemas marinos de **México**.
17 estados de nuestro país se ubican frente al mar y en **14** de ellos podemos encontrar coral.
En **México** los corales viven en las costas de:

Sonora, Sinaloa, Nayarit, Colima, Jalisco, Michoacán, Guerrero, Oaxaca, Veracruz, Campeche, Baja California y Baja California Sur, Yucatán y Quintana Roo.

Cabo Pulmo se encuentra entre los arrecifes de coral más conocidos de **México**.

Los arrecifes coralinos en el Mundo

Relaciona las siguientes columnas

1. Los corales son parte muy importante de la biodiversidad … ( ) … Belice y Guatemala.
2. El arrecife de coral más grande del mundo es … ( ) … Arrecife Mesoamericano.
3. El más importante de América se llama … ( ) … México hasta Honduras
4. Tiene más de … ( ) … el arrecife de la Gran Barrera en Australia.
5. Es una impresionante formación de corales que se extiende desde … ( ) … 1,000 kilómetros de largo
6. Pasando por … ( ) … de las zonas costeras tropicales del planeta.

El mar me enseña. Somos vida. Arrecifes coralinos

Fotografías: **2016 Mar Vivo**

Agradecemos a la **Sociedad Mexicana de Arrecifes Coralinos, A.C.**, y especialmente al **doctor Pedro Medina Rosas**, su apoyo para la realización de estas actividades.
visita: www.somac.org.mx
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Fecha: _____

Mar Vivo

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Servicios Ambientales

La Sociedad Mexicana de Arrecifes Coralinos presenta:

Los **servicios** ambientales son los **beneficios** que obtenemos de todos los **recursos** naturales.
Algunos de los beneficios ambientales que obtenemos de los arrecifes de coral son:

Protección:

- Previenen el desgaste del fondo marino,
- Nos protegen del fuerte impacto de las olas, especialmente durante tormentas y huracanes,
- Incluso, los arrecifes coralinos ayudan a reducir la cantidad de gases efecto invernadero que van a la atmósfera.

Medicina:

- El esqueleto de los corales está formado por carbonato de calcio. El carbonato de calcio es un mineral que se utiliza en la medicina humana y se aplica para regenerar los huesos.

Inspiración:

- Los arrecifes de coral son sitios turísticos muy atractivos para toda clase de visitantes, especialmente para los buzos ya que pueden disfrutar de un impresionante acuario natural.

Alimento:

- Una gran parte de los productos pesqueros que consumimos del mar está relacionada con los corales porque los arrecifes funcionan como refugio para peces como el mero, el pargo, también para los cangrejos, langostas, pulpos y caracoles.

Los arrecifes de coral son ecosistemas
que nos dan riqueza, alimento, medicina, inspiración y protección.

El mar me enseña. Somos vida. Arrecifes coralinos

Fotografías: **2016 Mar Vivo**

Elaborado por Dolores Monterrubio

¿Quieres saber más sobre el Programa Educativo Mar Vivo?
visita: www.marvivo3d.com

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