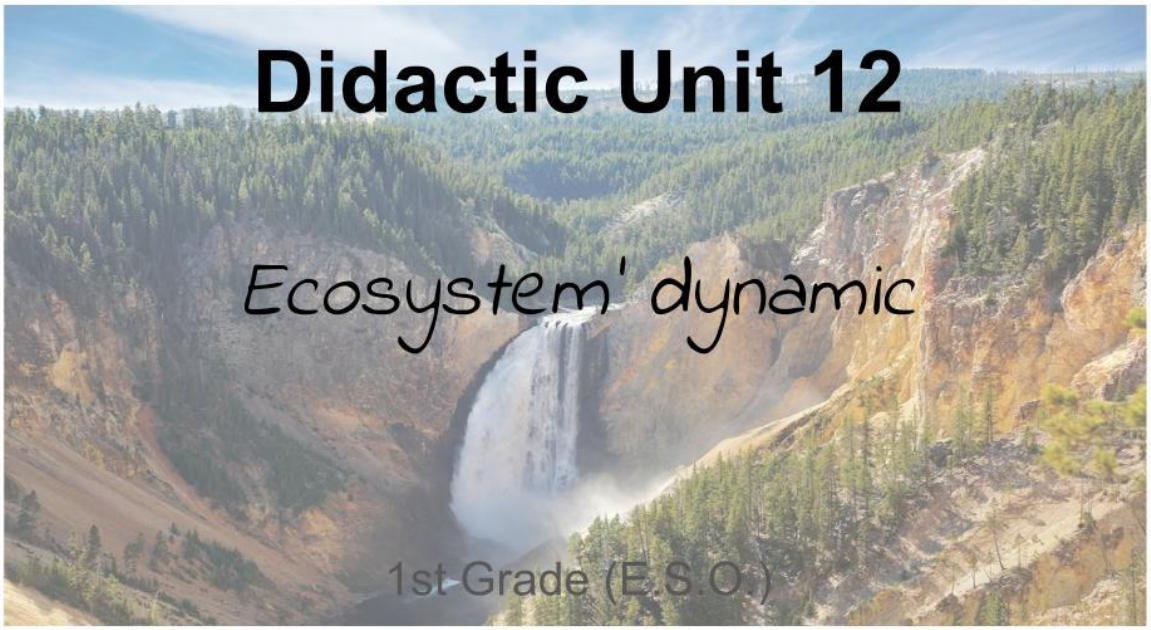
X. ANEXOS

1. Didactic Unit 12 Materials

- 1 -



- 2 -

Ecosystem Dynamics

- Ecosystems and Ecosphere
- Ecosystem elements
- Dynamic balance
- Environmental impacts
- Environmental conservation

- 3 -

Ecosystems and Ecosphere

Ecosystem: Compound of all the living organisms that inhabit a certain place, as well as the relationships they establish between species and the environment.

1. Biotope

2. Biocenosis

Ecosphere: Compound of all the ecosystems on earth.

- 4 -

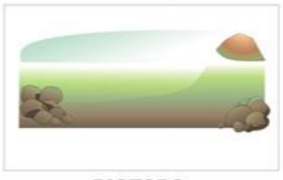
Ecosystem elements

1. Biotope

2. Biocenosis

2.1. Ways of nourishment

2.2. Relationships within the ecosystem



BIOTOPO

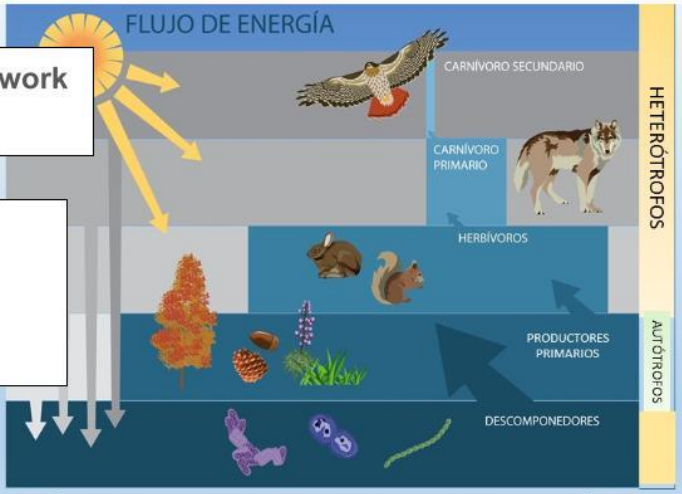
BIOCENOSIS

- 5 -

2.1. Ways of nourishment

Pyramidal and network trophic models

- Producers
- Consumers
- Decomposers



On-line game: "Build your own trophic-chain"

- 6 -

2.2. Relationships within the ecosystem

Intraspecific relationships

Family ties

Social association

Gregarious association

Colonial association

Interspecific relationships

(+ -) Predation (lion-zebra)

(+ +) Symbiosis (lichen, alga-fungus union)

(- -) Competency (cheetah-hyena)

- 7 -

Dynamic balance

- An ecosystem is balanced when all of its biocenosis populations* are limited by natural factors.
- The balance of the ecosystems (ecological balance) is dynamic: when natural conditions change, the ecosystem adapts until it achieves a new balanced situation (climax).

***Population:** a group of individuals who belong to the same species that interact within themselves (intraspecific relationships) and with populations of other species (interspecific relationships).

- 8 -

Environmental impacts

Environmental impacts

Are the result of all human activities that produce a change in the dynamic balance of the ecosystem.

- 9 -

Environmental impacts

Climatic and anthropic change

1. Pollution and global-warming (biotope)

    1.1. Atmospheric pollution (temperature increase, poles, glaciers and Pyrenean lakes thaw)

    1.2. Water pollution (rivers, lakes and seas pollution)

    1.3. Soil contamination (loss of fertility, desertification)

- 10 -

Environmental impacts

Climatic and anthropic change

2. Loss of biodiversity (biocenosis)

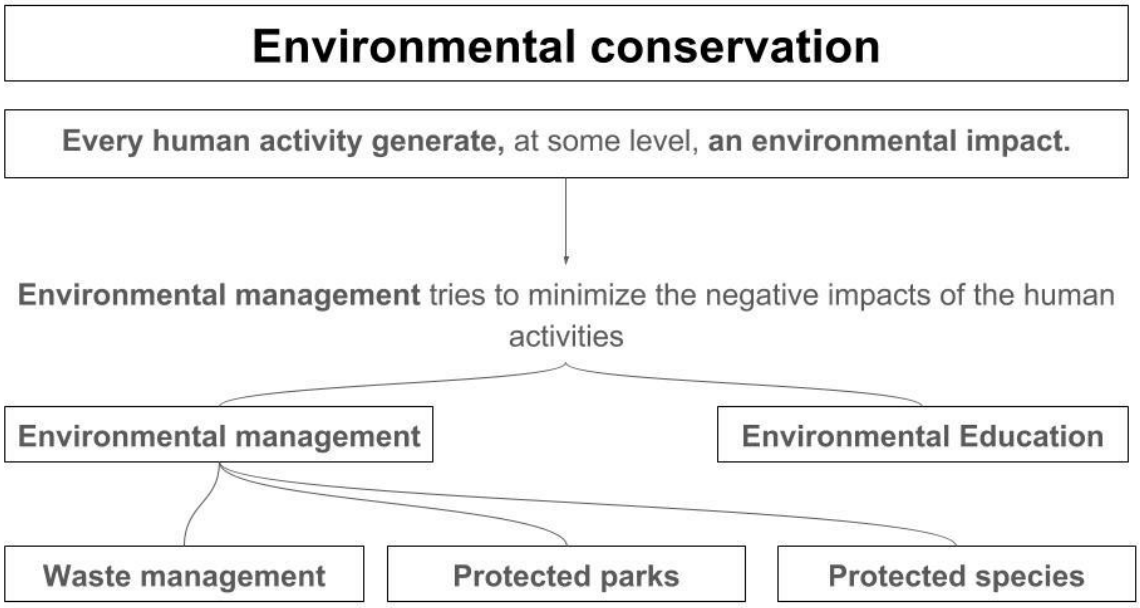
    2.1. Introduction of exotic species

    2.2. Monoculture and transgenics

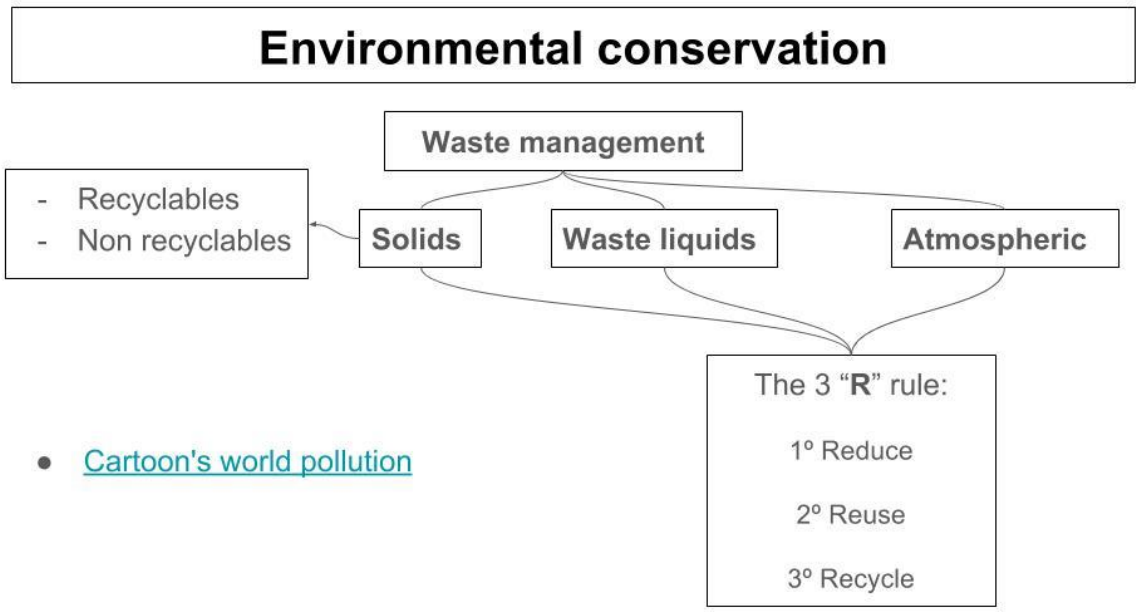
    2.3. Provoked fires.

    2.4. Species extinction.

- 11 -



- 12 -



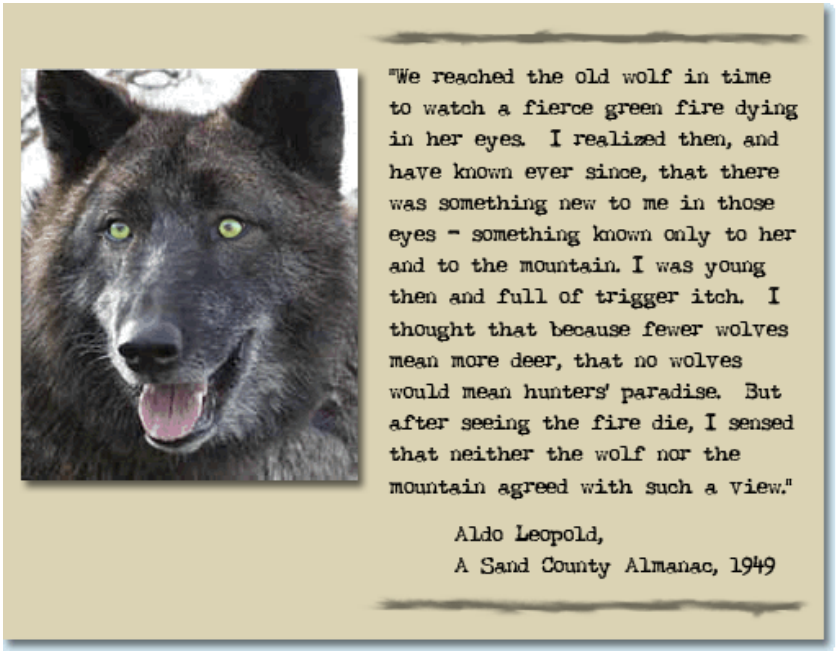
- Cartoon's world pollution

Environmental conservation

¡You can also help!

2. “Trophic cascade”

a. ***Materials for classroom inclusion***



b. *Goals, premises and roles for each group*

General goal of the role-playing activity *"trophic cascade"*:

1. Participate actively according to your group's and the other groups' rules.
2. Cooperate with the rest of the groups to achieve the three specific goals.

Specific goals of the role-playing activity *"trophic cascade"*:

1. Move the deer to the river (bears and wolves)
2. Deprecate the herbivores species overpopulation (foxes and eagles)
3. Shift the river along with the deer (deer, beavers and rabbits)

General premises and participation rules in the role-playing activity *"trophic cascade"*:

1. The "grass" appears where the river is.
2. Each team has only one minute turns to participate.
3. The rabbits and beavers are respectively situated in the "grass" and the "river".
4. The river can only shift when deer, beavers and rabbits are inside it.
5. Each team is self-governed to get their members ready before starting.

Specific premises and participation rules for the *"trophic cascade" activity*:

Wolves
Lead the deer towards the river only by using light slaps on their shoulders.

Deer
Be led blindfolded by wolves and bears.

Bears
Reinforce the wolves' duty using "basketball blocks" with their hands inside their coats/jackets.

Eagles
Stay as training barricade ("hawk game") in which the goal is to capture rabbits as they go and foxes on the way back.

Beavers
Once the deer and rabbits are in the river, guide the rope with their hands inside their coats/jackets.

Rabbits
Participate in the "Scarf game" against the foxes while the eagles are around in training barricade ("Hawk game"). The rabbits move towards the eagles and the ones that manage to pass through pick up the scarf from another member and try to return running pursued by the foxes (it's a one on one competition). The rabbits who achieve their goal get to return to the "river's grass".

Foxes
Participate in the "Scarf game" against the rabbits while the eagles are around in training barricade ("Hawk game"). The must capture the rabbit with it runs away with the scarf (one on one competition).

Groups for the *"trophic cascade" activity*:

1º D

Wolves	Deer	Bears	Eagles	Beaves	Rabbits	Foxes
Sebas	Diego	Sofía	Ángel	Ayman	Clara	Alberto
Coxi	Alex	Justin	Ibrah	Enrique	Alba	Jorges
Jose	Vera	Ainhoa C.	Cristofer	Pablo	Ainhoa E.	Dani, A.
Yeray		Ana	Teresa	Kevin		

1º C

Wolves	Deer	Bears	Eagles	Beaves	Rabbits	Foxes
Ana Mª A.	Daniela C.	Daniel H.	Jeni T.	Javier M.	Óscar N.	Raquel M.
Dalia Mª M.	Jetay H.	Álvaro C.	Carla Mariana V.	Miguel L.	María N.	Gerard M.
Lesly V.	Ainhora N.	Jesús Manuel A.	Javier I.	Eduardo A.	Teodoro S.	Óscar R.
		Hugo A.		Samuel B.	Fredy R.	Elena P.

1º B

Wolves	Deer	Bears	Eagles	Beaves	Rabbits	Foxes
Naiara A.	Adrián L.	Peter Antonio, B.	Joel C.	Rubén B.	Chamba E.	Paula M.
Sergio A.	Carlos Martínez	Piero Leonardo, C.	Jesús C.	Daniel B.	Ainhoa P.	Paula G.
Carla Wenli, A.	Lucía R.	Daniel I.	Pablo M.	Diego D.	Andrea R.	Silvia L.
Narcis D.			David J.	Nerea M.	Joana G.	

c. ***Final debate and Mark headings***

In short:
1. How do you think was your own activity attitude? And your classmates attitude? 2. What concepts we have seen reflected in the activity from the previous video? 3. What is a *trophic cascade*? What kind of relationships it establishes?

Co-evaluation **heading: "Trophic cascade"**

Your classmates achieved...	Yes everyone	Moreover	Not at all
The general objectives?	***0.5***	***0.25***	***0***
The specific objectives?	***0.5***	***0.25***	***0***
a correct debate participation?	***0.5***	***0.25***	***0***
the key-content recognition?	***0.5***	***0.25***	***0***
TOTAL	**/ 2**		

Teacher's heading: "Trophic cascade"

Participation / Concepts recognition	**4**	**2**	**0**
1.- Participation during the activity	He/she participates actively during the session, cooperating with his/her teammates	Participate during the activity without cooperating with his/her team or disrupting other teams	Disruptive attitude or not participating
2.- Debate and questioning participation	He/she answers creatively to the questions given	He/she answers to the questions without a proper key-concept recognition	Not answering the questions
TOTAL	**/ 8**		

d. *Activity records*

Album record - 1-

Album record - 2-

Album record - 3-

e. Activity assessment

Grupo 1º C

Alumno/ a		Rúbrica	
		co-ev.	Docente
1	**A., Ana María Diana**	1.8	8
2	**A. R., Eduardo**	1.8	8
3	**A. G., Hugo**	1.8	8
4	**A. T., Jesús Manuel**	1.8	7
5	**B. P., Samuel**	1.8	8
6	**C. E., Álvaro**	1.8	8
7	**C. G., Daniela**	1.8	8
8	**H. F., Jetay**	1.8	8
9	**H. M.Daniel**	1.8	8
10	**I. P., Javier**	1.8	8
11	**L. M., Miguel**	1.8	8
12	**M. C., Javier**	1.8	8
13	**Morán Naranjo, Gerard Alain**	1.8	7
14	**M. L., Raquel**	1.8	8
15	**M., Dalia María**	1.8	8
16	**N. G., María**	1.8	8
17	**N. M., Óscar**	1.8	8
18	**P. M., Elena**	1.8	8
19	**R. L., Fredy Alexander**	1.8	7
20	**R. L., Óscar**	1.8	1
21	**S.G., Teodoro**	1.8	8
22	**T. S., Jenifer Dennis**	1.8	8
23	**V. J., Ainhoa Nerea**	1.8	8
24	**V., Carla Marina**	1.8	7
25	**V., Lesly**	1.8	8

Grupo 1º D

Alumno/ a		Rúbrica	
		co-ev.	Docente
1	A. I., Ibrahim	1.6	4
2	A. M., Justin	1.6	8
3	A. L., Daniel	1.6	8
4	A. C., Alberto	1.6	8
5	B. E., Ayman	1.6	8
6	B. P., Enrique	1.6	5
7	C.A., Ainhoa	1.6	8
8	Coxi Lázaro, Daniel	1.6	4
9	E. G., Ainhoa	1.6	8
10	F. E., Teresa	1.6	8
11	G., Yeray	1.6	4
12	G. M., José Miguel	1.6	8
13	M. R., Alba	1.6	8
14	M. R., Jorge	1.6	8
15	M. A., Clara	1.6	8
16	M. T., Jorge	1.6	8
17	M. G., Diego	1.6	7
18	M. L., Kevin	1.6	7
19	N., Sebastián	1.6	0
20	P. R., Sofía	1.6	8
21	S. A., Alejandro	1.6	2
22	S. C., Ana Belén	1.6	8
23	S. C., Miguel Ángel	1.6	0
24	S. M., Pablo	1.6	8
25	V. M., Cristofer Rodrigo	1.6	4
26	V. S., Daniel	1.6	0

Grupo 1º B

Alumno/ a		Rúbrica	
		co-ev.	Docente
1	A. Á., Naiara	1.9	8
2	A. M., Sergio	1.9	5
3	A. V., Carla Wenli	1.9	8
4	B. L., Peter Antonio	1.9	8
5	B. E., Rubén	1.9	8
6	B. C., Daniel	1.9	8
7	C. G., Joel	1.9	8
8	C. S., Jesús	1.9	8
9	C. T., Piero Leonardo	1.9	8
10	C. T., Angie Elisabeth	1.9	8
11	D. G., Diego	1.9	8
12	D., Narcis Julián	1.9	8
13	G. A.,Yohana	1.9	8
14	G. A., Paula	1.9	8
15	I. C., Daniel	1.9	8
16	J. V., David	1.9	8
17	L. M., Silvia	1.9	8
18	L. M., Adrián	1.9	8
19	M. J., Pablo	1.9	7
20	M. C., Carlos	1.9	8
21	M. S., Nerea	1.9	8
22	M. G., Paula	1.9	8
23	P. A., Ainhoa	1.9	8
24	R. M., Andrea	1.9	8
25	R. V., Lucía	1.9	8