



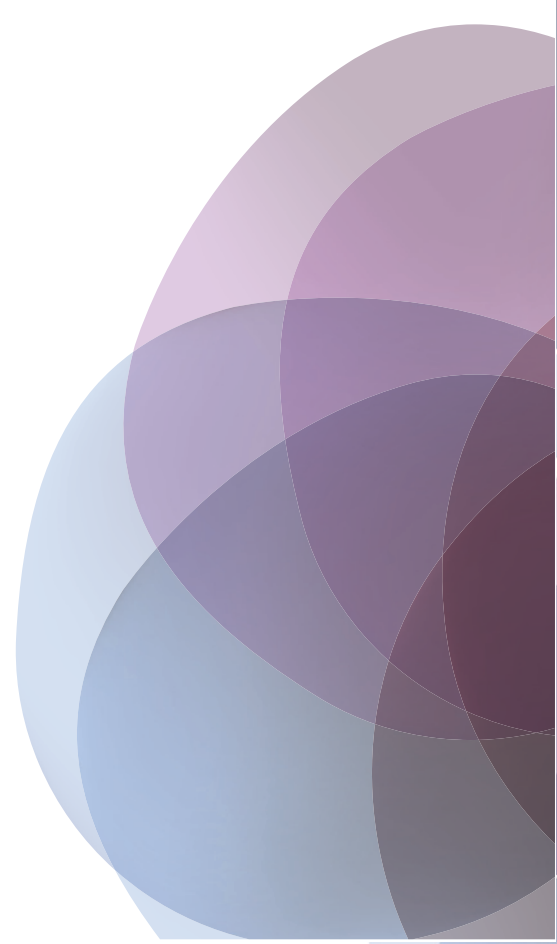
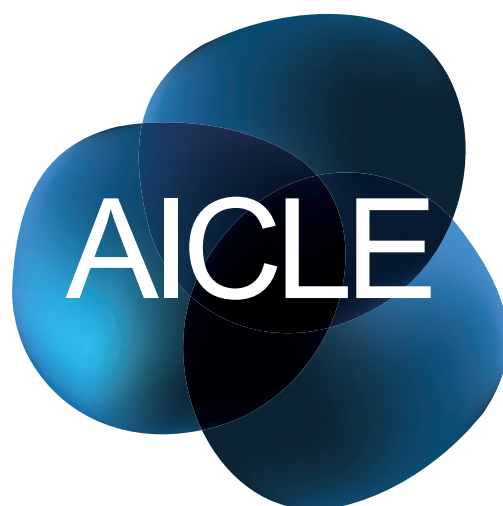
# Ciencias naturales

Secundaria



JUNTA DE ANDALUCÍA

Inglés





## Identificación del material AICLE

<b>TÍTULO</b>	The Ecosystems
<b>NIVEL LINGÜÍSTICO SEGÚN MCER</b>	A.2.1
<b>IDIOMA</b>	Inglés
<b>ÁREA / MATERIA</b>	Ciencias Naturales
<b>NÚCLEO TEMÁTICO</b>	El medio ambiente natural.
<b>GUIÓN TEMÁTICO</b>	El concepto de ecosistema y sus características es el centro desde el que se describe el mismo, así como es la base para el estudio de el flujo de materia y energía en el mismo, sustentado por los seres vivos que integran el ecosistema y los cuáles son los encargados de mantener el equilibrio necesario para que la vida sea posible.
<b>FORMATO</b>	Material didáctico en formato PDF
<b>CORRESPONDENCIA CURRICULAR</b>	2º de Educación Secundaria
<b>AUTORÍA</b>	Fernando Sánchez García
<b>TEMPORALIZACIÓN APROXIMADA</b>	6 sesiones (2 semanas)
<b>COMPETENCIAS BÁSICAS</b>	Conocimiento e interacción con el medio físico. Conociendo y respetando el ecosistema en el que se vive Digital y tratamiento de la información. Descubriendo en diferentes fuentes los diferentes ecosistemas existentes así como su funcionamiento, que siempre es necesario y complementario de cualquier otro. Social y ciudadana. El equilibrio en el ecosistema es la base de la persistencia de la vida tal y como la conocemos, incluso la propia existencia. Aprender a Aprender. A través de mapas conceptuales relacionar diferentes implicaciones de la acción individual en la vida colectiva, generándose conocimientos básicos para la preservación del medio.
<b>OBSERVACIONES</b>	La competencia de comunicación lingüística es una competencia tratada de forma continuada tanto en inglés como en español.

# Tabla de programación AICLE

<b>OBJETIVOS</b>	<ul style="list-style-type: none"> <li>- Interpretar y producir con propiedad, autonomía y creatividad mensajes que utilicen códigos artísticos, científicos y técnicos</li> <li>- Comprender los principios básicos que rigen el funcionamiento del medio físico y natural, valorar las repercusiones que sobre él tienen las actividades humanas y contribuir activamente a la defensa, conservación y mejora del mismo como elemento determinante de la calidad de vida</li> </ul>						
<b>CONTENIDOS DE CURSO / CICLO</b>	Bloque 6. El medio ambiente natural						
<b>TEMA</b>	<ul style="list-style-type: none"> <li>- Biosfera, ecosfera y ecosistema. Identificación de los componentes de un ecosistema. Influencia de los factores abióticos y bióticos en los ecosistemas</li> <li>- El papel que desempeñan los organismos productores, consumidores y descomponedores en el ecosistema</li> <li>- Realización de indagaciones sencillas sobre algún ecosistema del entorno</li> </ul>						
<b>MODELOS DISCURSIVOS</b>	<ul style="list-style-type: none"> <li>- Leer y escuchar las lecturas sobre los puntos del tema</li> <li>- Expresar opiniones y conceptos adquiridos en los diferentes debates y resúmenes que se plantean</li> <li>- Relacionar los diferentes contenidos entre sí para obtener una red de relaciones lo más extensa posible, a través de las redes tróficas y la interdependencia de los seres con otros.</li> <li>- Consensuar tareas de cooperación en pequeño y gran grupo</li> </ul>						
<b>TAREAS</b>	<ul style="list-style-type: none"> <li>- Ejercicios de vocabulario específico con definiciones monolingües</li> <li>- Realización de mapas conceptuales en los que se relacionan los diversos conceptos</li> <li>- Preparar presentaciones para el resto de compañeros en formato digital</li> <li>- Exponer al resto de los compañeros los resultados de pequeñas investigaciones del entorno</li> </ul>						
<b>CONTENIDOS LINGÜÍSTICOS</b>	<table border="0"> <tr> <td style="vertical-align: top;"> <b>FUNCIONES:</b>            - Describir los componentes de un ecosistema            - Relacionar los diferentes componentes de un ecosistema y sus interacciones            - Discutir como afecta la variación de factores al equilibrio de un ecosistema.            - Argumentar de forma científica la necesidad de que los ecosistemas estén en equilibrio como base del desarrollo sostenible            - Sintetizar las ideas principales sobre funcionamiento de un ecosistema.            - Contrastar, explicar y dialogar con diferentes opiniones de forma razonada y con argumentos objetivos basados en el estudio científico de los ecosistemas         </td> <td style="vertical-align: top; padding-left: 20px;"> <b>ESTRUCTURAS:</b>            Did you find....?            Look for information .....            Can you spell.....            Can you repeat            May I .....?            Complete this chart with            Find this concept            I agree         </td> <td style="vertical-align: top; padding-left: 20px;">           I disagree            Connect with linkers            In my opinion this is right            There is/ are            In order to            Look around            Instead of            It could be            If I understand         </td> </tr> <tr> <td colspan="3" style="padding-top: 10px;"> <b>LÉXICO:</b> Biocoenosis, Biotope, Relationships, Ecosphere, Sunlight, Humidity, Biotic, Abiotic, Linkers, Average, Barometric Pressure, Soil, Suspended material, nutrients, Moisture, Solvent, DNA, Proteins, Polysaccharides, Photosynthesis, Specific Heat capacity, Coral, Ant, Crab, Biomolecules, Living beings, Interbreeding, Organisms, Family, Population, Colonial, Gregarious, State, Symbiosis, Mutualism, Commensalisms, Predation, Parasitism, Inquinism, Competition, Lice, Ñu, Shark, Clownfish, Anemone, Elephant, Seagull,         </td> </tr> </table>	<b>FUNCIONES:</b> - Describir los componentes de un ecosistema - Relacionar los diferentes componentes de un ecosistema y sus interacciones - Discutir como afecta la variación de factores al equilibrio de un ecosistema. - Argumentar de forma científica la necesidad de que los ecosistemas estén en equilibrio como base del desarrollo sostenible - Sintetizar las ideas principales sobre funcionamiento de un ecosistema. - Contrastar, explicar y dialogar con diferentes opiniones de forma razonada y con argumentos objetivos basados en el estudio científico de los ecosistemas	<b>ESTRUCTURAS:</b> Did you find....? Look for information ..... Can you spell..... Can you repeat May I .....? Complete this chart with Find this concept I agree	I disagree Connect with linkers In my opinion this is right There is/ are In order to Look around Instead of It could be If I understand	<b>LÉXICO:</b> Biocoenosis, Biotope, Relationships, Ecosphere, Sunlight, Humidity, Biotic, Abiotic, Linkers, Average, Barometric Pressure, Soil, Suspended material, nutrients, Moisture, Solvent, DNA, Proteins, Polysaccharides, Photosynthesis, Specific Heat capacity, Coral, Ant, Crab, Biomolecules, Living beings, Interbreeding, Organisms, Family, Population, Colonial, Gregarious, State, Symbiosis, Mutualism, Commensalisms, Predation, Parasitism, Inquinism, Competition, Lice, Ñu, Shark, Clownfish, Anemone, Elephant, Seagull,		
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<b>CRITERIOS DE EVALUACIÓN</b>	<ul style="list-style-type: none"> <li>- Definir los conceptos de población, biocenosis, biotopo, biosfera y ecosistema, poniendo en cada caso un ejemplo</li> <li>- Explicar qué condiciones deben cumplirse para que un biotopo y una biocenosis constituyan un ecosistema</li> <li>- Citar algunos factores, clasificarlos en abióticos y bióticos</li> <li>- Explicar en qué consisten diferentes relaciones interespecíficas</li> <li>- Definir el concepto de nivel trófico, citar los distintos niveles tróficos que se encuentran en un ecosistema y explicar la función de cada nivel</li> <li>- Explicar el flujo de la energía y el ciclo de la materia en un ecosistema</li> <li>- Explicar esquemas que representen cadenas y redes alimentarias sencillas</li> </ul>						

Brainstorm.

Look around you and talk about all the things, people and animals that you can see

I can see.....through the window  
There are trees on .....  
Here it is ....  
Look, this is a fly .....

## 1.-What is an Ecosystem



Ecosystems are made up of:

- The living beings that inhabit a particular place: **BIOCOENOSIS** (Biotic Community).
- The physical characteristics of the place: **BIOTOPE**
- The **RELATIONSHIPS** among the different types of elements.

Types of ecosystems:

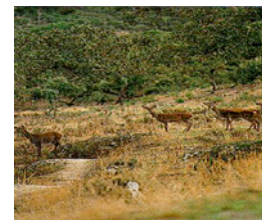
- Aquatic systems: The environment is water.
- Land systems: The environment is air.



The ecosystems can be characterized by two factors:

- **Biotic Factors:** A factor created by a living thing or any living component within an environment in which the action of the organism affects the life of another organism, for example a predator consuming its prey: This is a **BIOCOENOSIS** and a **RELATIONSHIP**

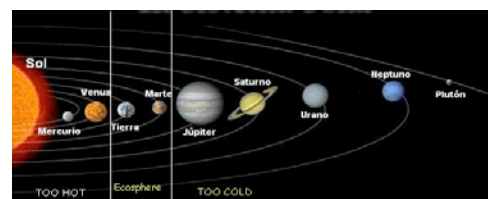
- **Abiotic Factors:** A non-living chemical or physical factor in the environment, such as soil, pH, forest fire, etc: This is a **BIOTOPE**.



**TERRESTRIAL ECOSPHERE (BIOSPHERE):**

The earth, all of the organisms living in it, and all of the environmental factors which act on the organisms. The volume of area where biological matter can exist, slightly above, or below the ground level.

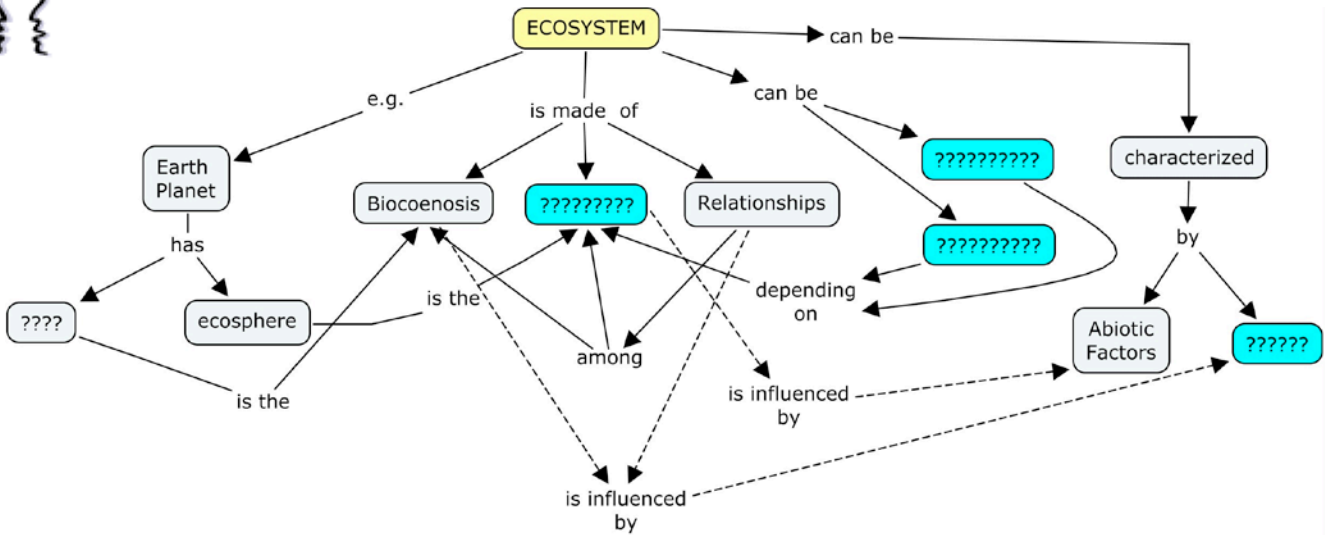
The earth is situated in the habitable zone (HZ)



Now sum up the previous concepts.  
 Key words: Ecosystem, Biotope, Biocoenosis, Biosphere, relationship



A.1. One person will copy the C-map on the board. The rest of the class must copy it into their notebooks and suggest different answers.



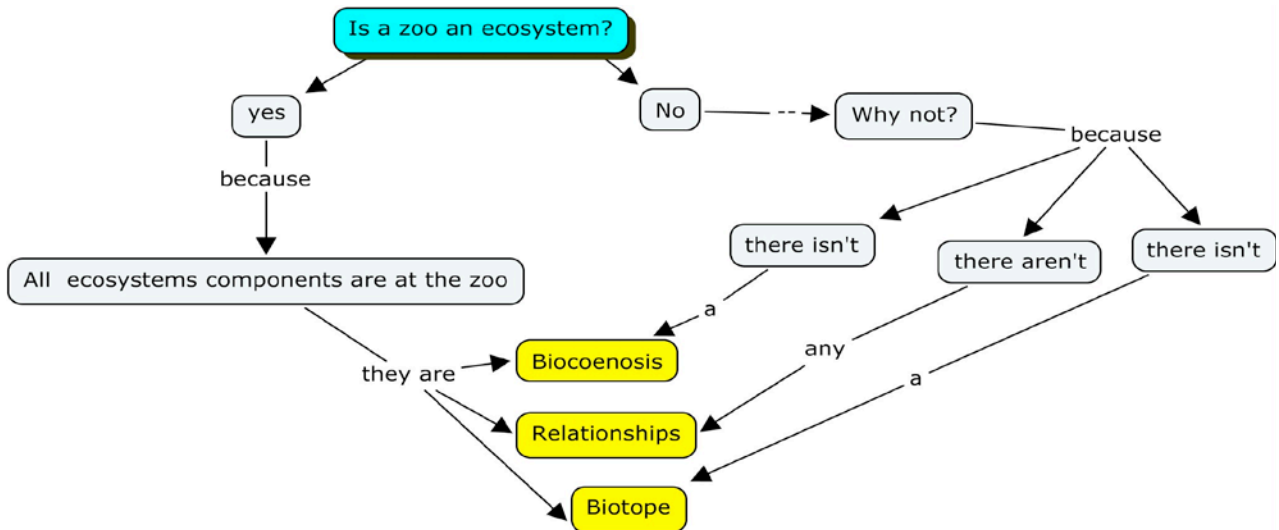
- Biosphere
- Biotope
- Biotic Factors
- Terrestrial
- Aquatic

Discussion:  
 Where would you place the concept .....? Please tell us the concepts that are connected with it.  
 I write the concept ..... joined with .....  
 In my opinion this concept might be situated here, joined with .....



## A.2. Is a zoo an ecosystem?

In order to answer the question, follow the arrows on the C-map. One of you must copy the map on the blackboard while the rest of you think of different answers.



Now write the correct answer.

Discussion:

I think the correct path is .....

I think you're wrong because .....



## 2.-Abiotic factors



### 2.1. Environment:

The abiotic component of an ecosystem includes various **physical** and **chemical** factors



Now sum up the previous concepts.

Key words: Abiotic factors , environment, Physical factors, Chemical factors,







A.3. One of you will write a classification chart on the board. The chart must classify how the following factors affect either aquatic, terrestrial or both ecosystems. The rest of the class must copy the chart into their notebooks and make suggestions.

Levels of toxic substance      current water      barometric pressure  
average precipitation      average temperature      sunlight  
suspended solid material      dissolved nutrients      water salinity

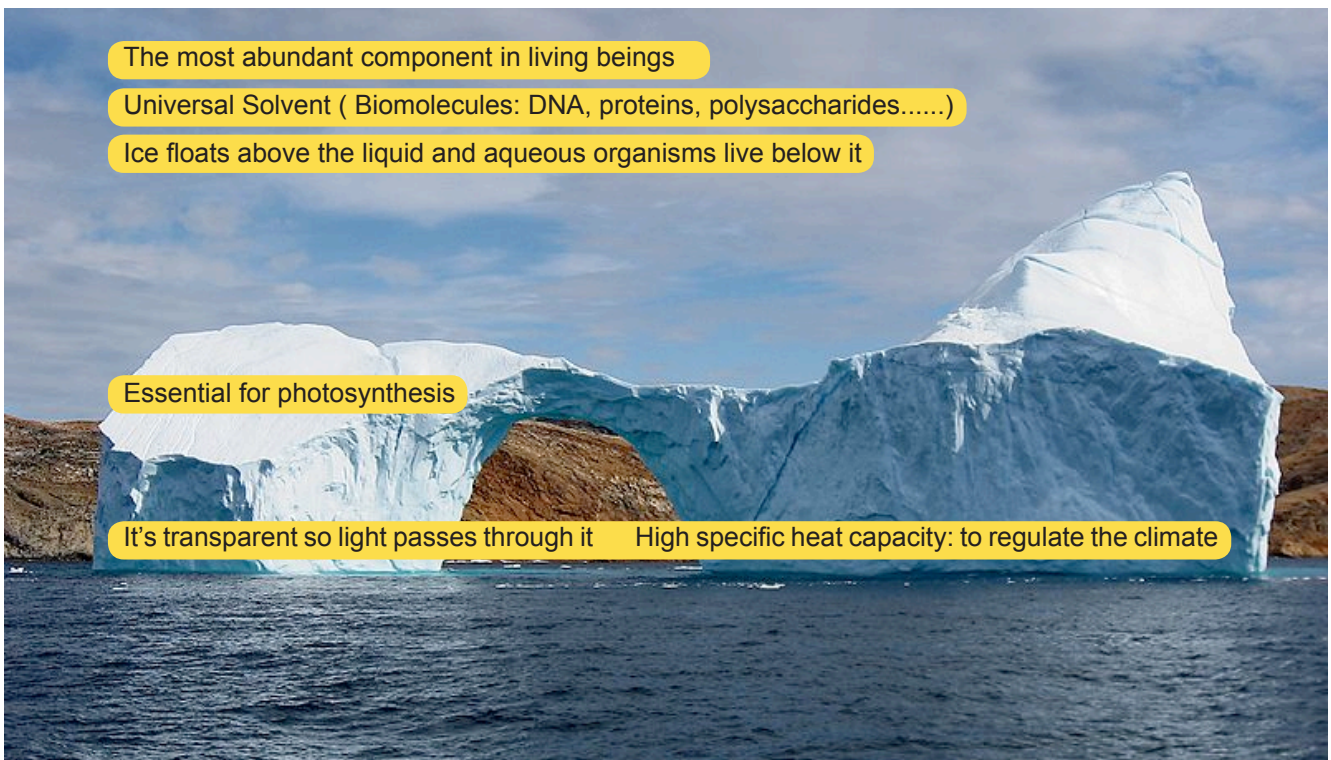
Discussion:

In my opinion, this factor influences..... because .....

Instead of this I think that .....

I agree with you that ..... but I disagree that .....

## 2.2. Water:





A.4. Here are some concepts about water taken from the previous image. One of you will do a C-map on the board while the rest of the class helps to think of answers and copies the chart into their notebooks.

WATER	Solvent	Biomolecules	DNA
Protein	Polysaccharides	Transparent	
Temperature regulator	Regulate climate	Abundant component	
Living beings			

Discussion:

Where would you place the concept .....? Please tell us the concepts that are connected with it.

I joined..... with .....

In my opinion this concept might be situated here, with .....

I think.....would be better here because.....



A.4. Listen to this text summarizing how water functions in the ecosystem. Pay close attention and fill in the blanks.

Water is \_\_\_\_\_ as the universal solvent, primarily due to its \_\_\_\_\_ and \_\_\_\_\_ properties:

It is one of the essential substances of life. Biomolecules (\_\_\_\_\_, proteins, polysaccharides, etc.) are \_\_\_\_\_ in water.

It is also one of the requirements for \_\_\_\_\_. It is transparent, making it possible for aquatic plants to live in since sunlight can \_\_\_\_\_

It has the second highest \_\_\_\_\_ \_\_\_\_\_ (after ammonia) and turns into vapour at a very high temperature. These properties allow water to regulate the \_\_\_\_\_.

It is less dense upon freezing, causing the \_\_\_\_\_ \_\_\_\_\_ (ice) to float above the surface, making it possible for aqueous \_\_\_\_\_ to still live below.



Can you repeat the .....paragraph

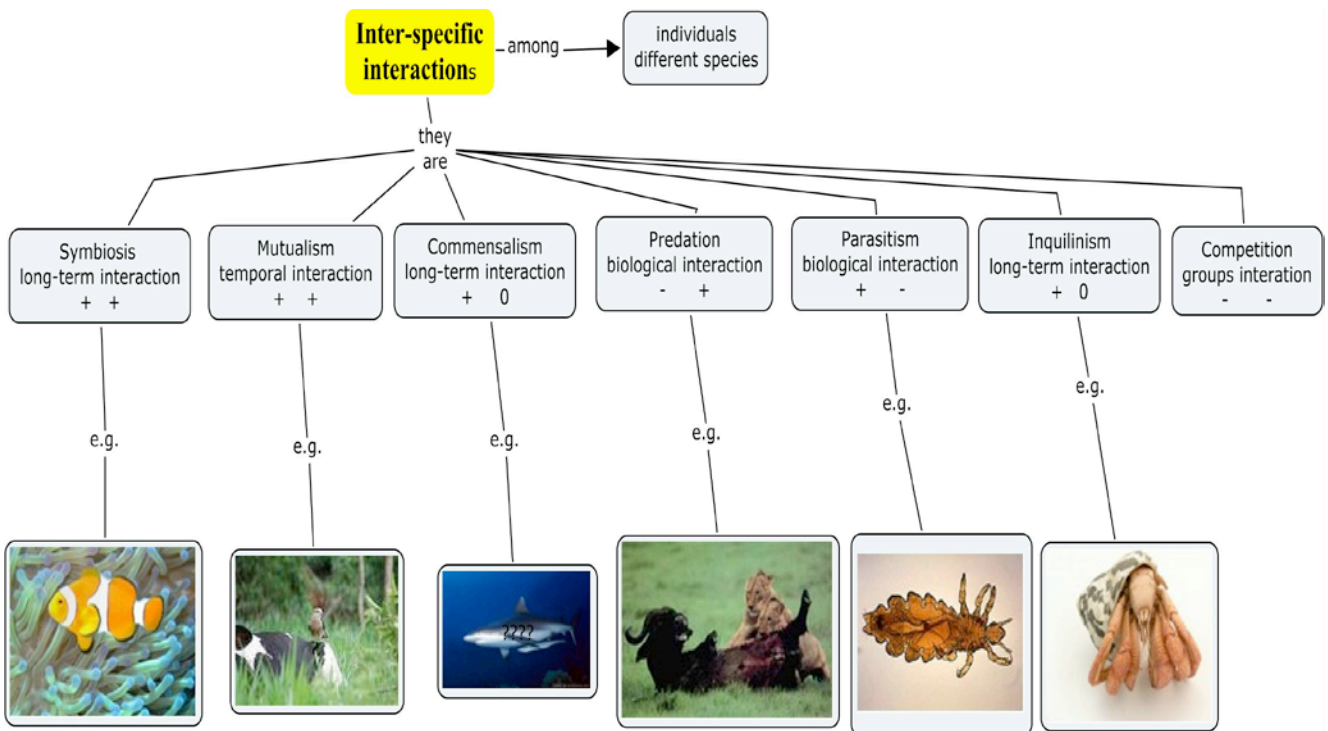
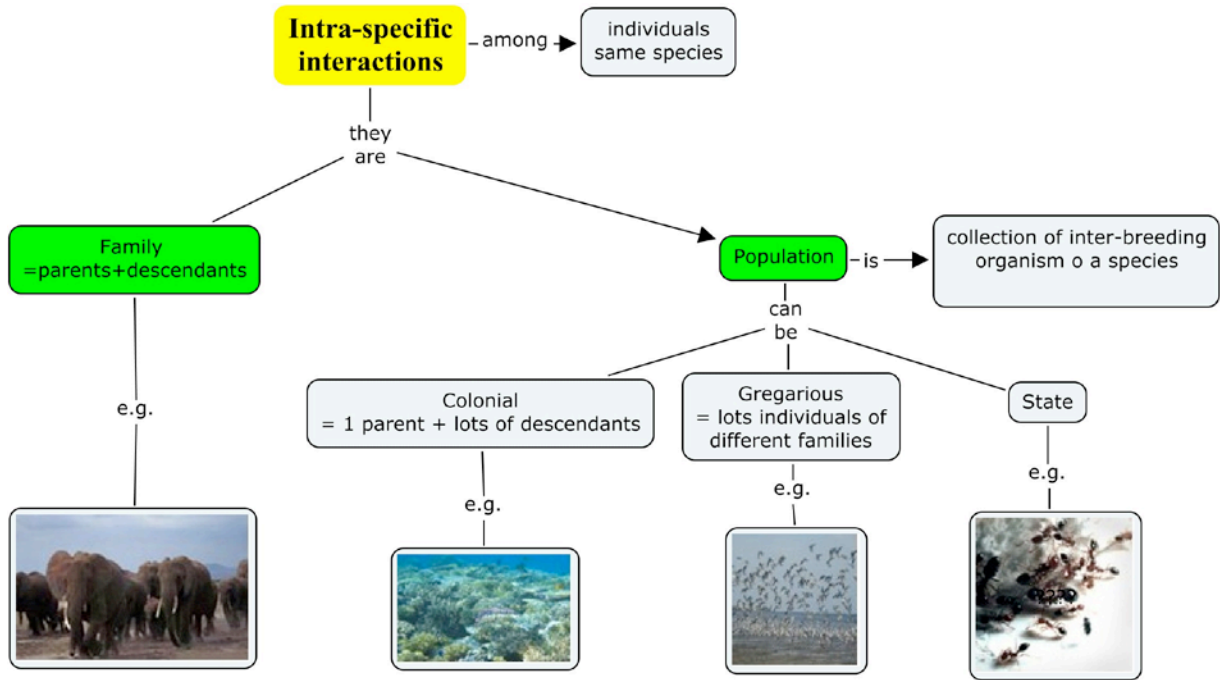
How many words are there in the .....gap of the paragraph ....?

Can you spell .....?

### 3.- Biotic factors: Living components.



Biotic factors are those resulting from the activities of a living thing or any living component in an environment, such as the actions of an organism affecting the life of another organism. These activities keep the ecosystem in balance, so that living organisms can continue, uninterrupted, with their interactions.



Now sum up the concepts.

Key words: Intra-specific, inter-specific interactions, Biocoenosis





Challenge: look at the C-map again. Say where each of these animals goes.

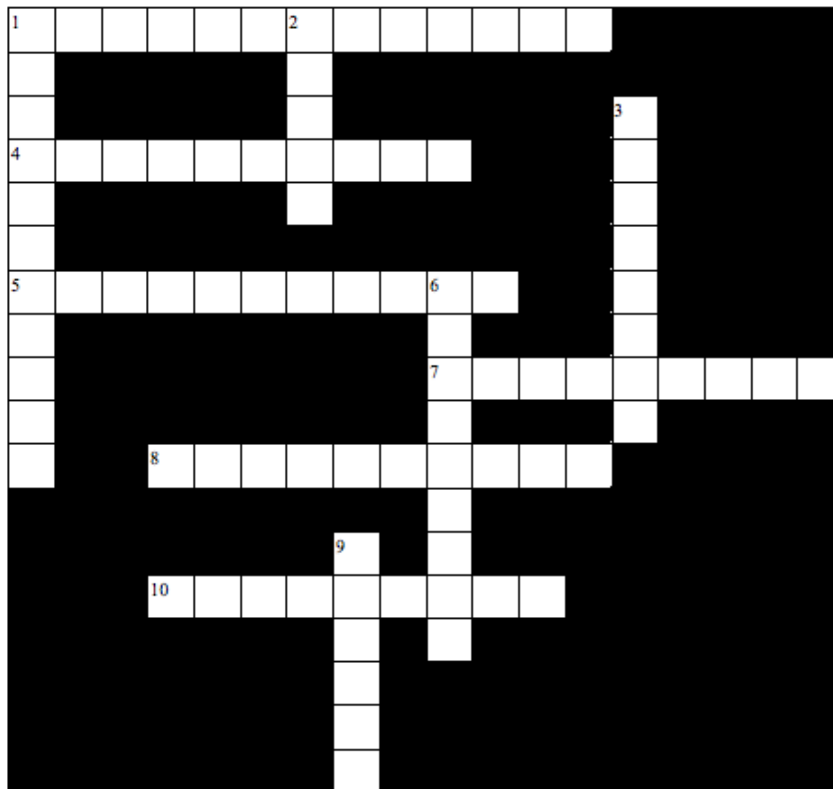


- |                        |                          |               |
|------------------------|--------------------------|---------------|
| 1: Bird+cow            | 2: Shark and remora fish | 3: Lion + gnu |
| 4: Clownfish + Anemone | 5: Elephants             | 6: Seagulls   |
| 7: Coral               | 8: Hermit crab           | 9: Ants       |
|                        |                          | 10: Head Lice |

Discussion:

I think number ..... is in the ..... from the left  
 In my opinion.....is the ..... from the right but it is a ..... interaction.  
 Are you sure .....? I think you're wrong.....  
 Look this is a photo of a ..... so this is .....  
 This photo shows a/an.....

A.5. Complete this crossword puzzle. When you finish, highlight the intra-specific relationships in yellow.



Across:

1. It's the relationship between a remora fish and a shark
4. One species obtains benefits while the other one is harmed
5. One species use the other one as its home
9. Elephant offspring and their parents are this.
7. Both of the species have a fitness benefit
8. A flock of seagulls is this type of population
10. This is the relationship between a lion and a gnu.

Down:

1. The rivalry for resources or territory
2. Ants are this type of population
3. A coral island is this type of population
6. Clown fish and sea anemones have this type of beneficial relationship.

### Discussion

What is the first letter for..... across?

Do.....and .....have any letters in common?

I think the 1st word is.....



Tell your classmates everything that you know about what we've been studying. Answer these questions.

- What things do you understand?
- Can you tell your classmates the differences between abiotic and biotic factors?
- Can you explain the influence of abiotic factors on the ecosystem?

### Discussion

If I understand this, then.....

I disagree because.....

I agree but I would add that.....

## 4.- Energy and materials in the ecosystem.



### 4.1. Energy flow

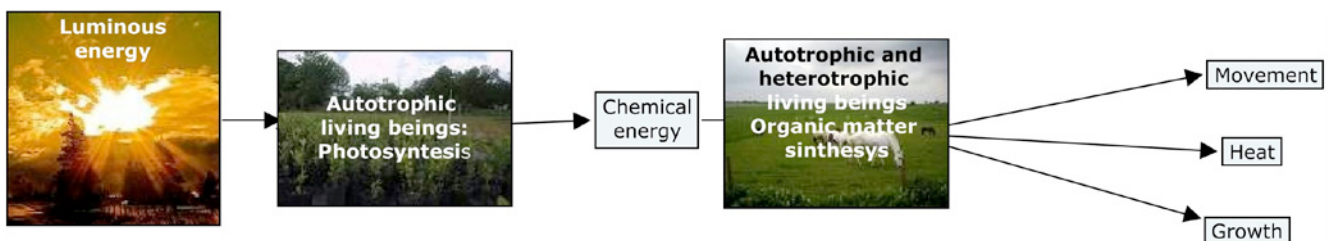
Ecosystems must receive energy constantly to work properly.

The energy which makes an ecosystem function comes from the SUN

The luminous energy which reaches an ecosystem is converted into chemical energy when it is taken in by living beings.

The luminous energy goes from one being to another by means of food and, finally, it is lost as calorific energy.

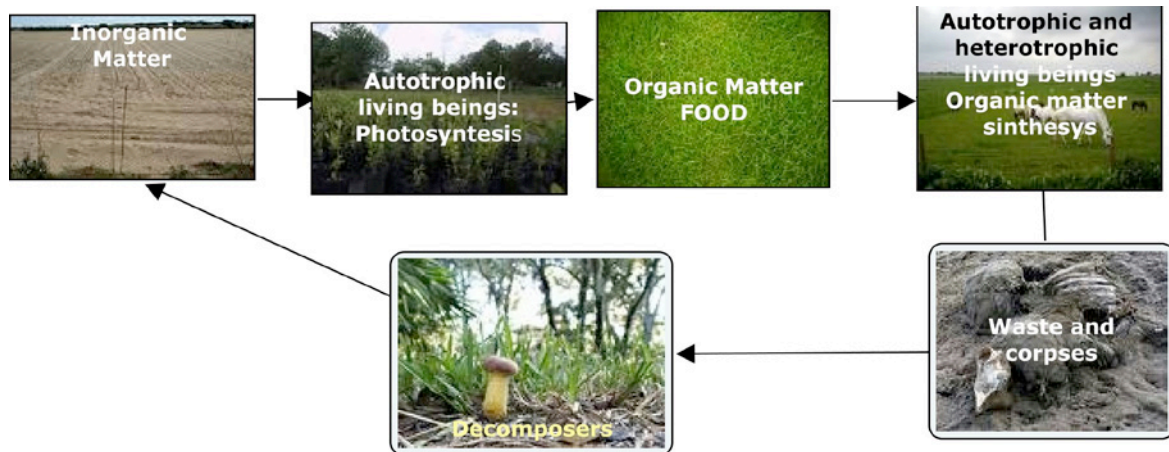
We can say that energy circulates as a flow, following a LINEAR PATH.





## 4.2. Material flow.

Inorganic matter in an ecosystem is taken by autotrophic living beings which transform it into organic matter. Other autotrophic and heterotrophic beings eat this organic matter and then it goes from one of them to another by means of food. The waste and corpses are transformed into organic matter again by decomposers. In this case, we say that matter circulates in the form of a CYCLE.



## 4.3. Trophic Levels

Within ecosystems, matter and energy in the form of food, go from one being to another so as to ensure their survival and allowing the ecosystem to function properly. Depending on the way in which they get their food, we can distinguish different levels of food or trophic levels:

- **Producers:** are autotrophic living beings which capture the energy from the Sun and, by means of photosynthesis, transform the inorganic substances from the soil into organic substances.
- **Consumers** are heterotrophic beings that take organic matter manufactured by other beings and transform it into their own matter. There are different categories in this trophic level:
  - **Primary consumers**, which feed on the producers.
  - **Secondary consumers**, which feed on the primary consumers.
- **Decomposers.** Bacteria and some fungi. They use the remains of beings from the other levels as their source of matter and energy. These beings bring about the decomposition of the organic matter and transform it into inorganic matter.







#### 4.4. Trophic chains.

Trophic or food chains are a way of representing the passing of matter and energy among the living beings of an ecosystem. They always begin with a producer which transfers its matter and energy to a primary consumer, and this may be followed by a secondary consumer. It is called a trophic chain because the living beings are linked together by food as though they were joined in a chain.



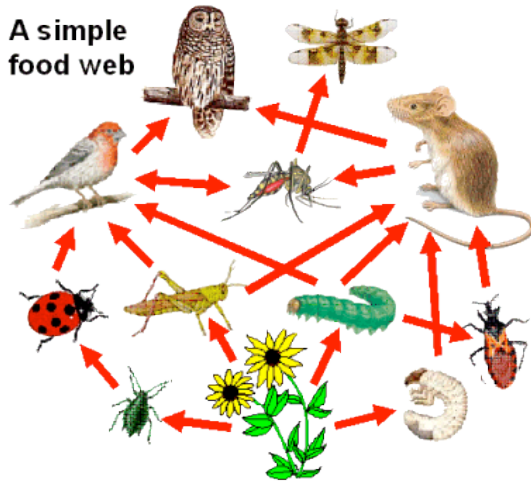
#### 4.5. Trophic Networks (webs).

-Trophic networks are a set of trophic chains that cross over because they have common steps.

-It is difficult to find isolated trophic chains in an ecosystem.

-A very complex ecosystem may have an enormous trophic network made up by thousands of trophic chains.

A simple food web



•How much have you learned?

- 1. How does energy flow in an ecosystem?
- 2. How does matter flow in an ecosystem?
- 3. How do you represent the flow of matter in an ecosystem?
- 4. How do living things obtain their food?
- 5. Discuss the concepts as a class. Explain what you know and comment on your classmates ideas.

#### Discussion

If I understand this then,.....

I disagree because.....

I agree but I would add that,.....

A.6.

a) Listen. Number the living beings from 1-24 in the order that you hear them.



Cow

Bush

Beech

Horse

Mink



Deer

Rabbit

Chestnut

Fox

Otter



Fungus

Lynx

Badger

Polecat

Genet



Iberian Wolf

Stoat

Pine tree

Pine Marten

Wild cat



Weasel

Brown Bear

Oak

Squirrel

Can you repeat the number .....?  
Can you spell .....?

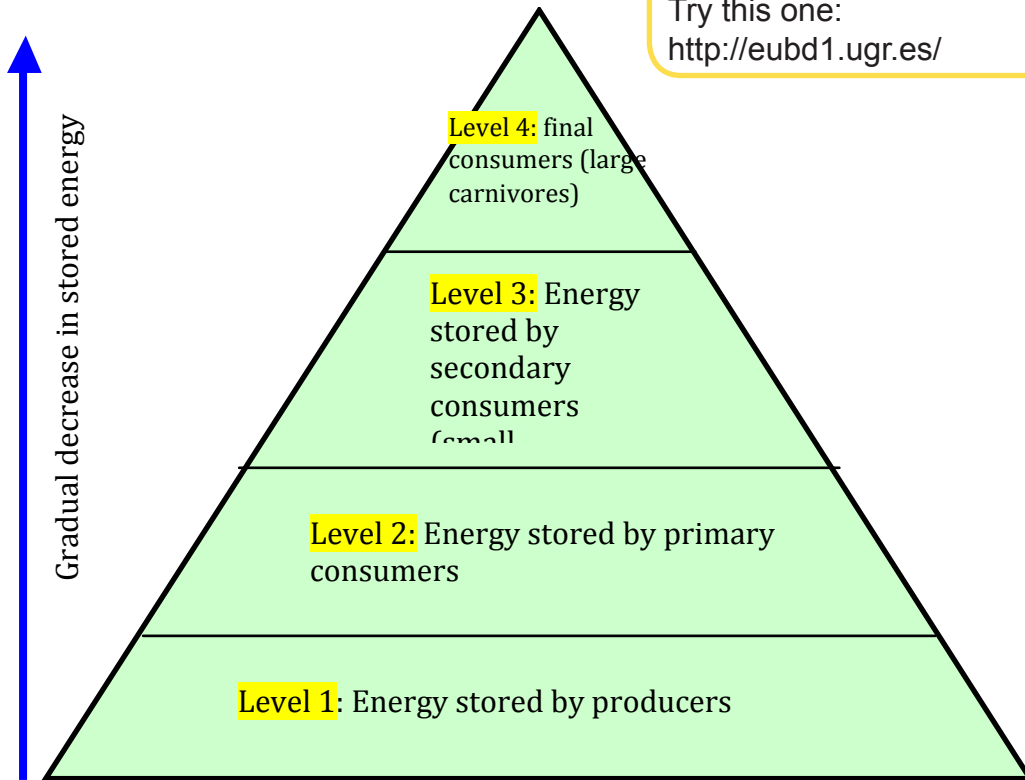


b) This is an energy pyramid that includes different levels, one for producers and the rest for consumers.



One of you will draw a pyramid on the board, filling it in with the animals from the last activity. The rest of the class will help to fill in the pyramid and make sure that all of the animals are at the correct level. Everyone should copy the pyramid into their notebooks.

Use a dictionary to help you.  
Try this one:  
<http://eubd1.ugr.es/>



Discussion:

I think..... should go.....  
Are you sure of.....? I think you're wrong because.....  
Look this is the photo of a ..... so.....





A.7. Describe the food chain or web that you are a part of. Pay attention to what you eat, where it comes from, where the waste goes, what materials are in the food, what your position in the web is, what influences your food choices have on the environment, etc.

I have ..... in the morning  
 I have a ..... during the break at school.  
 I use .....to wrap with.....  
 The waste I produce goes to.....  
 In the web I am in the .....level



A.8. Make a C-map summarizing what you have learned about the ecosystem. Make sure to include the concepts below.

ECOSYSTEMS	The Biosphere	The Earth	HZ	Living Organisms	Biotpe
Biocoenosis	Intra-specific interactions	Inter-specific interactions	Trophic levels	Energy flow	Producers
Consumers	Decomposers	Trophic interactions	Food chains	Food webs	Ecological Pyramid
Biodiversity	Biological Value				

Discussion:

Where would you put .....? Please tell us the concepts that are connected with it.  
 I joined.....and.....  
 In my opinion, .....should go here, with .....  
 It would be better to.....



### A.9. Project

Work in groups of four and do some field work.

-You will need a digital camera.

-Choose an ecosystem to observe (your own or another ecosystem close to where you live)

-Take photos of the different components of the ecosystem (don't forget to number photos and take notes about the characteristics of the things that you photograph)

- Use your computer to make a presentation with your photos. Present the results of your investigation to the rest of the class. Don't forget to make a clear distinction between biotopes, biocoenosis and relationships.

**Note: Ideally, each group will choose a different ecosystem.**

This ecosystem is made up of .....

Typical living beings in this ecosystem are .....

There are different types of .....

Look this is a consumer, so .....

Reflect: What I learned.

Read this quote by Jim Fowler:



Our challenge for the future is that we realize we are very much a part of the earth's ecosystem, and we must learn to respect and live according to the basic biological laws of nature.

- Can I distinguish the different parts of an ecosystem?
- Can I explain what balance in an ecosystem is?
- Can I listen to different opinions, and give my own using persuasive arguments?
- Can I understand how all living things are a part of the natural balance?
- Do I have respect for biodiversity?

Appendix. Living beings Glossary:

Living Beings	Definition	Translation into Spanish
BADGER	An animal with greyish brown fur, a black and white head and a pointed face, which lives underground and comes out to feed at night	Tejón
BEECH	Beech (Fagus) is a genus of ten species of deciduous trees in the family Fagaceae	Haya
BROWN BEAR	The Brown Bear (Ursus arctos) is a large bear	Oso Pardo
BUSH	A type of plant, bigger and thicker than grass, but smaller than a tree.	Arbusto
CHESTNUT	Chestnut (Castanea), is a genus of eight or nine species of deciduous trees and shrubs in the Beech family Fagaceae	Castaño
COW	A domesticated bovine of either sex or any age.	Vaca
DEER	A quite large four-legged animal which eats grass and leaves	Ciervo
FOX	A wild mammal belonging to the dog family which has a pointed face and ears, a wide furry tail and often reddish-brown fur	Zorro
FUNGI	Any of various types of organism which obtain their food from decaying material or other living things.	Hongo
GENET	Genets are Old World carnivores of the family Viverridae, related to civets and linsangs.	Jineta
HORSE	A large hoofed mammal (Equus caballus) with a short-haired coat, a long mane and a long tail.	Caballo
IBERIAN WOLF	The Iberian wolf (Canis lupus signatus) is a subspecies of grey wolf that inhabits the forest and plains of northern Portugal and north-western Spain.	Lobo Ibérico
LYNX	A wild animal of the cat family which has brown hair, sometimes with dark spots on it, pointed ears and a short tail	Lince
MINK	Dark-coloured, semi-aquatic, carnivorous mammals of the family Mustelidae, which also includes the weasels and the otters.	Visón
OAK	The term oak can be used as part of the common name of any of about 400 species of trees and shrubs in the genus Quercus (from Latin "oak tree")	Roble



OTTER	Otters are amphibious (or in one case aquatic) fish-eating mammals	Nutria
PINE MARTEN	The European Pine Marten ( <i>Martes martes</i> ), or Pineten, is an animal in the weasel family	Marta
PINE TREES	Pines are coniferous trees in the genus <i>Pinus</i> , in the family Pinaceae	
POLECAT	The polecat <i>Mustela putorius</i> is native to Britain. It is part of the weasel family, the Mustelidae. It has a long body and short legs, with dark fur, especially dark on the legs and tail	Turón
RABBIT	A small animal with long ears and large front teeth, which moves by jumping on its long back legs	Conejo
SQUIRREL	A small furry animal with a long furry tail which climbs trees and feeds on nuts and seeds	Ardilla
STOAT	The stoat ( <i>Mustela erminea</i> ) is a small mammal of the family Mustelidae. It is also known as the short-tailed weasel and the ermine.	Armiño
WEASEL	Weasels are mammals in the genus <i>Mustela</i> of the Mustelidae family	Comadreja
WILD CAT	It is a small cat ( <i>Felinae</i> ) native to Europe, the western part of Asia, and Africa	Gato Montés