Erasmus +

ENERGY, TRANSPORTATION AND SUSTAINABILITY

NAME & SURNAME_____
NAME & SURNAME_____

COURSE _____DATE_____

UN Documents: Gathering a body of global agreements

Report of the World Commission on Environment and Development: Our Common Future

1. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

2. Thus the goals of economic and social development must be defined in terms of sustainability in all countries - developed or developing, market-oriented or centrally planned. Interpretations will vary, but must share certain general features and must flow from a consensus on the basic concept of sustainable development and on a broad strategic framework for achieving it.

3. Development involves a progressive transformation of economy and society. A development path that is sustainable in a physical sense could theoretically be pursued even in a rigid social and political setting. But physical sustainability cannot be secured unless development policies pay attention to such considerations as changes in access to resources and in the distribution of costs and benefits. Even the narrow notion of physical sustainability implies a concern for social equity between generations, a concern that must logically be extended to equity within each generation.

27. The world must quickly design strategies that will allow nations to move from their present, often destructive, processes of growth and development onto sustainable development paths. This will require policy changes in all countries, with respect both to their own development and to their impacts on other nations' development possibilities.

28. Critical objectives for environment and development policies that follow from the concept of sustainable development include:

- revivinggrowth;
- changing the quality of growth;
- meeting essential needs for jobs, food, energy, water, and sanitation;
- ensuring a sustainable level of population;
- conserving and enhancing the resource base:
- reorienting technology and managing risk; and
- merging environment and economics in decision making.

SUSTAINABILITY is the name of the economic, political, cultural and educational strategy that proposes to make use of natural resources so that human beings can continue to enjoy them in the future. It is about: changing our consumption so that it is responsible and efficient; recycling and reusing; choosing renewable energy sources; using public transportation services instead of one's personal vehicle; maintaining water quality; building energy-efficient housing; eliminating epidemics; achieving food sufficiency of Earth's inhabitants; and recognizing the value of the natural world.

1. Can you point out what we humans need to ...? (connect with arrows>)

breathe	water / pastures / other animals
nourish us	forests / soil / fossils
shelter	trees / plants / oxygen

2. And what do they need ... (linked by arrows>)

forests	water / plants
other animals	oxygen / trees
plants	minerals / soil

3. Can this shared dependence be beargued?

4. CROSS WORDS

"SOSTENIBILIDAD" is characterized by the 10 spanish words that you have to discover; in them you will find these 5 letters of the 14 that compose it:

the 2nd in the 10th position of the 1st
the 5th in the 4th position of the 7th
the 9th in the 4th position of the 8th
the 11th in the 5th position of the 3rd
the 14th in the 5th position of the 9th

1. Harmony and stability among people, interests, communities, forces, species in ecosystems ... _ _ _ _ _ _ _ _ _ _ (10)
2. Use the resources obtaining the best match, without exhausting them. _ _ _ _ _ _ _ _ _ _ (10)
3. Share initiatives, intervene in decisions, cooperate. _ _ _ _ _ _ _ _ _ _ (10)
4. Attitude of recognition, consideration and tolerance towards others. _ _ _ _ _ _ _ (7)
5. Management style of common things that promotes free access to information and participation, without corruption or secrecy. _ _ _ _ _ _ _ _ _ _ _ _ _ (13)
6. Valid principle to prevent negative consequences of human actions, at the environmental or social. _ _ _ _ _ _ _ _ _ _ (10)
7. In the Biosphere, it links us with current human beings, past and future, with the biodiversity of nature and with the environment. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (16)
8. It is created by the interactions between those who share an ecosystem or a human organization. _ _ _ _ _ _ _ _ (8)

9. Principle of justice: treat everyone with the same rectitude and impartiality.
_ _ _ _ _ _ _ (7)
10. It is formed by living ecosystems and human organizations that share the Earth.
_ _ _ _ _ _ _ _ (8)

5. The consumption of energy in our society is tremendous. This numerical estimation game will allow you to test your understanding of the topic. Round the solution you think is right.

220 / 110 / 10 years ago humans began to use cars; since then, the number of automobiles has greatly been increased: today roughly 150 / 550 / 850 million vehicles circulate on the roads

It is estimated that each car travels an average of 15,000 / 5,000 / 10,000 kilometers per year. The vast majority of these vehicles use gasoline or gas-oíl. They come from a source of renewable / non-renewable energy, clean / polluting and infinite / finite: oil.

Oil prices have suffered, recent years have seen spikes of up to 100 / 200 / 500 % and the consumption of gasoline or gas-oil of a car means an average of 800 / 1,200 / 1,800 dollars per year.

For every kilometer traveled by a car, the gasoline or gas-oil that is consuming emits 150 gr. of CO2 to the atmosphere; that means that, a year, a vehicle emits 1,500 / 750 / 2,250 kilograms of CO2; and that all the vehicles on the planet emit 400 / 1,900 / 900 million tons of CO2 per year.

If you look closely at the usage of vehicles, you will notice that, in most of the cases, the car is occupied by 1 / 2 / 4 people / s and the distances travelledare very short, about 5 / 10 / 20 kilometers, at a low average speed in the city: 17 / 37 / 57 kilometers / hour.

The current demand for oil is 14,000,000,000 / 100,000 / 1,000,000 liters newspapers. At this rate of extraction, there are reserves for 45 / 95 / 65 years; after this time period, the reserves will be depleted.

6. Yes, the worst figures to explain a consumption that seems to have no limits. But the Biosphere itself has them, does not he?

The change towards sustainability needs to recognize them and:

• use renewable sources
• consume efficiently, making good use of resources
• avoid entropy.

As you know, the laws of thermodynamics say: energy is neither created nor destroyed, is TRANSFORMED, and also that, when it loses its capacity to generate new transformations, it is DEGRADED

Entropy is dissipated, degraded energy. For example, the running engines of cars stuck in a traffic jam on the highway, instead of producing MOVEMENT they emit HEAT into the atmosphere. That heat will no longer generate new energy transformations.

The same happens when a stove is turned on while the windows are open because the temperature of the room is very high.

7. Or when ... could you give two other examples of entropy?

Example 1: I START THE HEATING AND, WITHOUT TURNING IT OFF, OPEN THE WINDOW BECAUSE IT MAKES A LOT OF HEAT

Example 2:

8. Making good use of energy resources is a feature of sustainability. Another, get fruit of renewable sources. Can you complete the list of your benefits?

The wind	eolic	_____
Solar radiation		
	Photovoltaic	_____
	solar thermal	_____
	passive solar	_____
The rivers and water channels	mini-hydraulic	_____
Waves and tidal waves	tidal	_____
Biomass energy crops,	forest waste,	_____
	herbaceous,	_____
	or agro-food	_____
Urban waste oils and cereals	organic biogas	_____
The heat of Earth	geothermal	_____
		_____

In our society, moving is synonymous with life and having a car, freedom.
But things are not free.

If you stop to think how much money you will pay, throughout your life, for gasoline - at least it has been until 2008 - to feel the freedom every day to use a car, you will find a figure that can well exceed ... $ 60,000 !!!
Have you thought about that?
How many hours will you have to work to get that amount?

Will that be a time of freedom or obligation?

However, this may start to change with electric cars and their lithium batteries, like those of mobile phones.

also, recognizing the quality of life and freedom when choosing means of transportationmore satisfying and efficient.

9. What is more satisfying?

- Two basketball players, aged 14, who live 500 meters away from one another, go to the Saturday´s game, at the High School , which is one half mile away from their homes.

... at 10:00, each one leaves in the car of his father, who will not be present at the full game because he will take advantage of the opportunity to go to the mall.

... they are at 9:30 and they ride together by bicycle; their families are approaching at 11:30 to watch the game, after making purchases.

- To go see two exhibitions in the city center on Sunday morning

…a family gets into the car and makes several laps to park, until it enters a parking lot; After leaving the first exhibition, repeat the same strategy.

... another family leaves the house and goes to the bus stop or the nearest subway; from one exhibition to another, walk.

- A group of friends of 15 years old want to spend a few days in the mountains ...

... they try to locate cars and give up because they can not find them.

... they look for the coaches that take them.

10. The most efficient means of mobility is ... (linked by arrows)

to go to the train station, to the other side of the city	to walk / bicycle
to meet in the park with friends	bus / tube
to go every day to work at the urban center	taxi
to visit a friend who lives in a city 200 km	plane
to go to another continent because of work	train

WHO CONTAMINATES LESS?

Our daily actions can collaborate in the fight against climate change.

In any city or town, this morning people like you have risen. They have turned on the light, they have put the coffee maker, they have showered, they have taken their car and refueled to go to work. Later they have made the purchase, and finally they have returned home.

With our daily actions, we collaborate more or less in the emission of greenhouse gases that are the cause of climate change.

Climate change is the change of the earth's climate because of human activities.

The cause of global warming is the increase of the natural greenhouse effect by the increase in the concentration in the atmosphere of the greenhouse gases produced by human activities.

The natural greenhouse effect allows life on earth by retaining part of the sun's heat that the earth returns to space.

From the industrial age, the increase in the concentration of C02 and other greenhouse gases (GHGs) in the atmosphere, produced mainly by the consumption of fossil fuels (coal, oil, gas) in the production of energy, in Transportation and in industry has caused an increase in the greenhouse effect.

The consequences of this are serious, and they are already happening;

- **Loss of ice from the poles and rise in sea level.**
- **Mountain glaciers around the world melt and lose surface.**
- **There are variations in the rainfall regime, which causes its reduction in many places and a resurgence of droughts.**
- **Increase in extreme weather events, occurring with more intensity: hurricanes, floods, heat waves ...**
- **The average temperature in Spain rose more than half a degree in the last 50 years and it is estimated that between 2071 and 2100 rise between 3 and 6 degrees.**
- **Animal and plant species see their habitat displaced or change their behavior.**

All this influences us decisively: the harvests depend on pollinating insects and the spring rainfall regime; more heat is more evapotranspiration and less water available in rivers and aquifers; a new thermal pattern supposes very serious waves of heat for the health and new vectors of little-known diseases, and so many and more things more ....

*11. These cards describe actions related to the way of life of each of them, it is about assigning **1 point** to those that **favor** the reduction of greenhouse gas emissions and those that consume less resources. Those who **do not** will be scored with **0 points.***

After answering, it is about discovering which of the characters has a more sustainable way of life and is collaborating to a greater degree in the fight against climate change.

a. Pilar Gil Lanaspa
64 years old, retired.

ACTION **POINTS**

He uses the tram and the bus to move around the city, he does not have a car. _____

In your home you have an old gas oil boiler. _____
The diesel oil comes from fossil fuel, which when burned emits Greenhouse Gases (GHG)

When you go to buy carry cart and cloth bags.
Plastic bags are made from oil and are a problem environmental damage due to the millions of units used every day in the world. _____

It has changed the traditional bulbs for others of low consumption and has managed to reduce consumption in electricity.
With this gesture we achieve significant savings in energy consumption and natural resources. _____

Collect the water from cooking the vegetables to water the plants. _____
It is an action of someone very sensitive to the conservation of the environment ambient.

TOTAL
_____

b. José Manuel de Frutos, 48 years old, teacher

ACTION **POINTS**

He uses his private car to go shopping, to the cinema or to visit a museum.
The private car represents 15% of all the final energy consumed in Spain. _____

When winter comes, turn on the gas heating throughout the day at a temperature of 24 degrees.
Gas is a fossil fuel. It is comfortable a temperature of 21 degrees, it is not sustainable or necessary to be at home in short sleeves in winter. _____

When you shave and brush your teeth, you let the water run in the sink.
We will save thousands of liters of water per year if we use it responsibly. _____

It has placed strips on the computer and television to prevent the devices from consuming power when they are in the standby position.
In this way you save on the consumption of electricity. _____

Use napkins and tissues always.
When it comes to acquiring "throwaway" products, think about if they are truly essential. Reuse whenever you can. _____

TOTAL
_____

c. Elisa Andrés Gil
40 years, environmental educator

ACTION **POINTS**

He walks to work every day.
In addition to reducing fuel consumption is very healthy. _____

He likes to shop in traditional markets near his home and buys seasonal products.
The transport of goods causes a high consumption of energy. So that we can eat green beans all year round, for months the beans travel from Morocco or more distant places to reach our homes. _____

He loves to travel and every year he visits very distant places traveling by plane.
The greenhouse gas emissions in this means of transport are very high. _____

This spring he has planted an orchard and grows his own vegetables.
It is a healthy, easy and economical option to reduce energy consumption, transport and it is also pleasant. _____

He does not like to spend the heat and in summer he has the air conditioning on day and night.
We can use the natural air currents opening windows, we can close the blinds during the day, is air conditioning really necessary? _____

TOTAL
_____

d. Laura, María, Lucrecia, María and Andrea.
14 years old, students

ACTION **POINTS**

They have the computer on continuously.
At stops of more than 10 minutes, turn off the screen. At stops of more than 30 minutes, turn off the computer. _____

They love filling the bathtub with very hot water and bathing instead of taking a shower.
The bathroom consumes up to 10 times more water than a shower _____

After a talk at the Institute about recycling, they take care at home to separate the garbage and take it to the appropriate container.
It is essential that we separate and recycle appropriately, this action reduces the amount of natural resources used. _____

They belong to a group of free time and twice a year they collaborate in a tree plantation in the pine forests of Zuera.
With this action they are collaborating in the fight against climate change. _____

When they print or make photocopies they only make them on one side.
Thousands of hectares of forest are cut down in the world to make paper. Use both sides when you print, write or photocopy. _____

TOTAL
_____

e. And now it's your turn, score 1 point if you act like this, add them and see the result.

ACTION **POINTS**

In my house and in the school I separate the garbage and I deposit it in the corresponding container. _____
I use recycled paper and write on both sides. _____
For lunch I take the sandwich in a cloth bag and do not wrap it in aluminum foil.____
I'm walking to school or I use school transport. _____
When I leave a room I always turn off the lights. _____

TOTAL

Result

5 points !! Congratulations!! With many people like you, we can stop climate change.

4 points You can see that you are aware, ask your teachers and parents what else you can do to collaborate in the fight against climate change.

3 points. There are a lot of behaviors that you can still change to prevent climate change from getting worse.

2 points. You have to find out more about the subject and you can convince yourself that we are all necessary to make a better planet.

1 point. Surely until today you did not know how important it is that you also act to avoid climate change. Cheer up!

0 points Hey! We also need you to fight against climate change, start thinking about what you can do. Thank you!

CARBON SULFILL ---------- DISCOVER THE MYSTERY

Trees help mitigate climate change

The main international instruments established to combat climate change are the United Nations Framework Convention on Climate Change and its Kyoto Protocol.

Article 4 of the Framework Convention establishes that countries should promote the sustainable management of forests (which allows a sustainable use of resources without decreasing them in the long term) and promote and support the conservation and reinforcement of "sinks", including biomass and forests.

Forests as carbon sinks:

Photosynthesis is the process by which plants in the presence of sunlight, capture carbon dioxide (CO2) from the atmosphere, emit oxygen and produce organic matter. What happens without hardly realizing it, allows life on Earth.

Carbon dioxide (CO2) is stored in trunks, branches, leaves, seeds and forest soils, thus acting as a carbon sink.

A very important issue is the permanence of carbon stored. Pests, diseases, excess logging and forest fires are the cause of which part of the CO2 previously absorbed and stored, is forwarded to the atmosphere.

Sustainable use of forests:

It is necessary to know the sustainable uses that can be made of a forest, thus contributing to its proper conservation. We must banish the idea that to conserve we must not "touch" the forests.

It can be a surprise to discover all that the forests offer us: The wood can be extracted in cycles of several years allowing the rest of the trees to grow, so the forest is able to regenerate itself.

Extensive cattle ranching and grazing have shaped our most unique landscapes: meadows, holm oaks and pastures.
Bees are especially beneficial as they perform pollination, which is essential for the reproduction of plants.
A prudent collection of mushrooms and fruits provides us with healthy and natural foods and provides us with pleasant moments of enjoyment.
The acquisition of certified forest products guarantees sustainable forest management.
The use of biomass as a source of renewable energy contributes to the conservation of natural ecosystems.

12. What is a carbon sink?

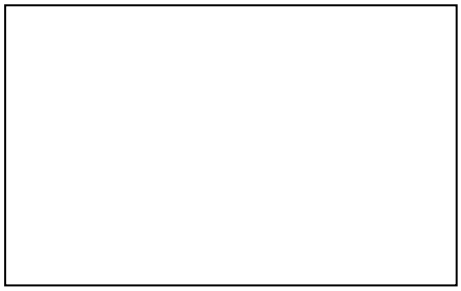
_____

13. How do plants absorb CO2? What is that process called?

_____

_____

14. Can you draw photosynthesis?



15. Where is the CO2 trapped by the plants stored?

_____

16. If a fire occurs or we clear a forest, what happens to the carbon stored?

_____

_____

17. How would you tell your little brother that forests act as carbon sinks? You can try to write a story or a story.

_____

_____

_____

_____

_____

_____