

Master Lesson Plan

For

Major Domains of the Earth

Board	Standard	Subject	Chapter	Language	Reference Link	Creation date
CBSE	STD VI	Social Science	Major Domains of the Earth	English	Major Domains of the Earth	2020-06-09 20:12:46

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Major Domains of the Earth

1. SSG_06_05_00_Objectives-Major Domains of the Earth

Objectives-Major Domains of the Earth

The students will be able to:-

- Acquire an understanding of the 4 domains of the earth and their characteristics
- Describe all the layers of the atmosphere
- Explain the role of plate tectonics in the lithosphere, especially oceanic and continental plates.
- Describe the 7 continents, and locate and name the oceans
- Identify characteristics of the biosphere as a domain of life on earth
- Recognize the significance of man's actions that can adversely affect the biosphere, causing climate change and atmospheric imbalances
- Appreciate man's role in preserving water-bodies in the hydrosphere

Time to teach	Asset Type	Theme	SubTheme
2 Minutes	Main Script	Solar system & the earth	

2. SSG_06_05_11_MS_Components of Environment

Components of Environment

- The three components of our environment are land (**lithosphere**), water (**hydrosphere**) and air (**atmosphere**) which come together in a close relationship, interacting and collaborating with each other to create conditions that enable life.



(Pics: Lithosphere/land, Hydrosphere/water, Atmosphere/air)

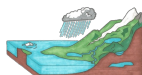
These conditions are:-

- A solid base and nutrient-rich soil, provided by the lithosphere
- Water, especially in its liquid form, provided by the hydrosphere. Water is essential for life; in fact, life originated in water.
- Air to breathe and protection from the sun's harmful rays, provided by the atmosphere.



- The **Lithosphere** is the solid part of the earth's surface comprising the continents and land lying beneath the oceans.

The earth's crust and upper mantle form this layer.



- The **Hydrosphere** is the liquid domain of the earth's surface and includes liquid water and solid ice.



- The **Atmosphere** is the gaseous layer around the earth's surface.

This layer is comprised of mainly Nitrogen and Oxygen, and smaller quantities of Carbon dioxide, water vapour and other gases.

All forms of weather are created here, and any climate changes are reflected in this layer.



The **Biosphere** is the thin strip where all three domains come together, interacting with each other and making life possible on the planet.

This layer comprises of all living organisms from tiny organisms like bacteria, to larger plants and animals, and the surrounding areas from which they derive energy and nutrients.

It extends high up into the atmosphere and very deep under the oceans.

Earth is the only planet on which life exists.

Image sources:

Land image : <https://pixabay.com/photos/landscape-nature-desert-dry-3182666/>

Water image: <https://pixabay.com/photos/river-trees-water-landscape-nature-2700909/>

Air image : <https://pixabay.com/photos/air-bag-wind-sock-weather-sky-1696481/>

Lithosphere: <https://pixabay.com/vectors/hill-soil-grass-ground-meadow-576591/>

Hydrosphere: <https://pixabay.com/illustrations/hydrosphere-water-iceberg-cloud-1929070/>

Atmosphere: <https://pixabay.com/photos/mill-wind-grind-tourist-tourism-1745186/>

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Main Script	Resources	Components of Environment, Components of Environment

3. Domains of the Earth

Aim: The different characteristics of each of the four domains will be described through the project.

Material required:

Each group will require

- Cardboard -3 nos. (sizes to be determined by teacher)
 - One for use as Atmosphere
 - One for use as earth surface which will include Lithosphere, Hydrosphere and elements of Biosphere.
 - One to cut out smaller individual elements to be placed in above domains
- Felt pens/ scale/glue/scissors
- Paints, brushes, and containers to mix paints (if required)



Pics: Material required

All the material, whether provided by teacher or brought by students, should be deposited with the teacher a day prior to the activity.

Setting for the activity:

Indoor

Type of activity:

Project

Procedure:**Each group will create a 3-D project showing clearly the 4 Domains, and the elements in it.****Before the day of the activity:**

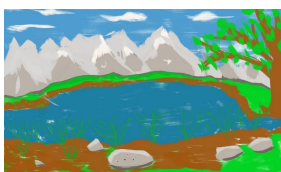
1. In an earlier class the teacher will organise the students into groups of 4 or 5 students each, depending on class strength.
2. The project will be discussed in detail and teacher will ask the students to bring all the required materials on a selected day before the activity day.
 - What elements should go in the domains e.g clouds, mountains, waterbody, plant and animal life etc, can be discussed earlier.
 - These elements can be drawn and coloured, or pictures can be used. If pictures are used they can be cut out earlier and deposited with teacher on the previous day.
 - The background cardboard depicting Atmosphere can be dark blue, and the surface of the earth can be a brown base. Coloured paper can be stuck or it can be painted. If coloured paper is being used, it can be stuck on the day of activity. However, if it is painted, it can be done earlier to allow it to dry in time for activity. The Hydrosphere can be a light blue colour and can be painted on, or coloured paper stuck, on the surface of the earth.
 - This can be done by any one student from each group, to be designated earlier by the teacher.

On the day of the activity:

- The teacher will distribute the materials to the students.
- The students will attach the 2 background cardboards suitably to each other.
- The individual elements should then be attached to these backgrounds.
- Any further colouring can be done.
- Domains should be clearly labelled.

Observation:

The projects will reflect the students' understanding of the domains, and visually show the unique features of each.

**Conclusion:**

This activity will help the students reflect their understanding of each domain.

Instructions to Teacher:

1. The teacher can guide the students about what features they can include under each domain. E.g students can be told earlier that it is not necessary to mark the different layers of the atmosphere.
2. Students should be guided on how to affix the 2 D images to the backgrounds. E.g to affix an animal to the biosphere, it will be necessary to have a small piece of cardboard attached behind each individual image.
3. On the activity day, teacher can observe, and guide where necessary.

Precautions: Care should be taken while cutting out individual elements for attaching to backgrounds.

Image sources:

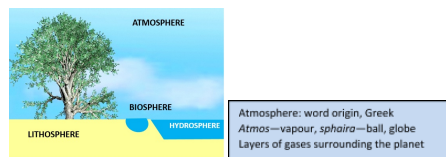
- Chart papers – CC- <https://pixnio.com/objects/yellow-envelope-paper-education-library-business-page-cardboard>
- Pens – CC- <https://pixabay.com/en/ballpoint-pen-pens-black-writing-41163/>
- Paints and Paintbrushes – CC - <https://www.maxpixel.net/Color-Brush-Paint-Cans-Of-Paint-Painter-Brush-2724510>
- Glue – CC- <https://pixabay.com/en/school-back-to-school-education-2596090/>
- Scissors – CC- <https://pixabay.com/en/a-pair-of-scissors-red-office-paper-3314438/>
- Landscape CC - <https://www.maxpixel.net/Mare-Landscape-Pastel-2097468>

Time to teach	Asset Type	Theme	SubTheme
20 Minutes	Suggested Activity	Solar system & the earth	Lithosphere, Hydrosphere, Biosphere – The Domain Of Life, Atmosphere, Lithosphere, Hydrosphere, Biosphere – The Domain Of Life, Atmosphere

4. Atmosphere

1. Among the four domains of the earth, the gaseous layer is called the atmosphere.

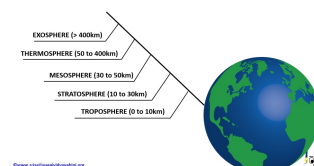
This layer clings to Earth by the force of gravity.



Pic: Atmosphere domain

2. Layers of atmosphere:

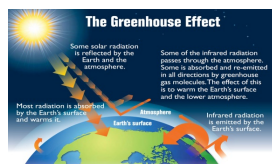
- This layer extends 1600 kms above the earth.
- It is further divided into **five layers** based on properties such as composition and temperature, among others.



Pic: Layers of atmosphere

3. Atmospheric temperature:

- The atmosphere is most dense and warmest near the earth.
- As one goes up the air is lighter and temperatures drop.
- The earth retains the heat of the sun, and this is then radiated upward.
- This is why the temperature is highest in the atmosphere near the surface of the earth and gets colder as one goes higher.



Pic: The Greenhouse Effect



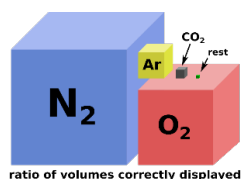
Pic: Cold at high altitude

4. Atmospheric pressure:

- The atmosphere exerts a pressure on earth, due to the weight of air; this varies at different points on the earth.
- Some areas experience high pressure, others experience low pressure. It is highest near the sea because it is most dense there, and decreases as the height increases, which is why mountaineers find it difficult to breathe at great heights without oxygen tanks.
- Air moves from high pressure to low pressure. Wind is the moving air, and can be a gentle breeze or destructive with great speed and force.



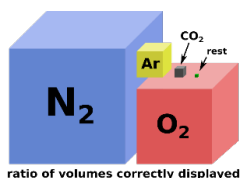
Pic: Mountaineering



Pic: Air movement

5. Composition of atmosphere:

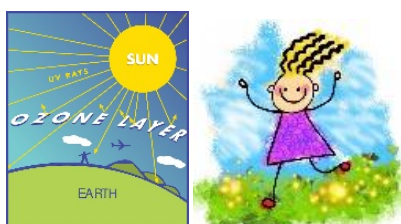
- Almost all of the atmosphere is nitrogen and oxygen--**Nitrogen- 78%** and **Oxygen- 21%**.
- The balance **1%** is comprised of Carbon dioxide, other gases and water vapour.



Pic: Atmospheric Gases

6. Benefits of atmosphere:

- The atmosphere covers the entire earth; from it we get the air we breathe.
- It protects us from harmful rays of the sun, and it makes life possible.
- The atmosphere also protects us from direct exposure to the harmful effects of the sun's ultraviolet rays.



Pics: Atmospheric layer and Happy girl

7. Main components:

Pics: Tree and Leaf

- **Nitrogen**---helps in the growth of living things.
- **Oxygen**----essential for life, it is inhaled by human beings and animals.
- **Carbon Dioxide**---keeps the earth warm by absorbing the heat radiated by the earth.

Essential for plants for photosynthesis.

If the level of carbon dioxide increases, it can have a negative effect on the climate and weather.

8. Troposphere:

Pic: Troposphere

- The name is derived from the Greek *tropos* meaning 'change', and *sphaira*, meaning 'sphere'. This is a reference to the turbulent changes seen here since almost all of the weather happens in this layer eg. rain, storms, windy skies and sultry heat
- This is the lowest layer, closest to earth.
- It is the densest of all the layers.
- In this layer it is warmest near the earth, and the temperature goes down as altitude increases
- The height at the Equator is more than that at the Poles.
- Most clouds are found here.
- Even the highest mountains come within this layer.

9. Stratosphere

- In Greek *stratus* merely means 'layer', and *sphaira*, means 'sphere'.
- This is the second layer of earth's atmosphere.
- Here the temperature increases as height increases. This is because the ozone layer exists here, and it absorbs the sun's ultra-violet rays.
- It is most fuel-efficient for commercial airlines to fly in the lower part of this layer, and avoid the weather turbulence in the troposphere.
- It is mostly free of clouds and weather



Pic: Atmospheric layers

10.Mesosphere

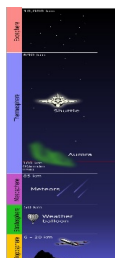
- This is the third, and middle, layer of the atmosphere. In Greek *mesos sphaira* translates to 'middle sphere'.
- It becomes colder as altitude increases.
- Rock fragments called meteors burn up in the mesosphere. The shooting star which can be seen in the sky could be a meteor burning in the mesosphere. Every day meteors fall towards the earth, and it is this layer that burns them up and prevents it reaching the earth.
- Sounding rockets or rocket-powered aircraft reach this layer, since it is too high for normal aircraft and too low for satellites.

11.Thermosphere

- Also known as the upper atmosphere, the thermosphere derives its name from the Greek words *thermos* meaning 'heat' and *sphaira* meaning 'sphere'. The temperatures can reach very high, due to the radiation from the sun.
- It is the largest layer in the atmosphere.
- Since the air density is extremely low in this layer, it is often considered to be a part of space.
- The space shuttle orbits in this layer.

12.Exosphere

- Exosphere comes from the Greek words *exo* meaning 'outside or external' and *sphaira* meaning sphere or globe.
- It is the outermost layer of the atmosphere. The upper edge of this layer fades into the vacuum of space.
- The air is very thin here, and very similar to that of airless interplanetary space. Satellites can orbit here too.



13.Ionosphere

- The Ionosphere layer, an indistinct layer from about 60 kms to about 1000 kms, includes the Thermosphere, and overlaps parts of the Exosphere and Mesosphere.
- In this ionized layer the radiation from the Sun is powerful enough to dislodge the electrons from their respective atoms and molecules.

These charged atoms and molecules, called **ions**, play an important role in atmospheric electricity and enables radio broadcasts to faraway places on the planet.

- The outer edge of the ionosphere overlaps the magnetosphere where charged particles are affected by the magnetic fields of the Sun and Earth causing the dramatic light effects in the sky called 'aurorae'. *Aurora borealis* and *aurora australis* occurs in Northern and Southern latitudes respectively.



Pic:Aurora Borealis



Pic:Radio transmission

Image sources:

- Atmosphere domain: OC: mudambisowmya@gmail.com
- Layers of atmosphere: OC: mudambisowmya@gmail.com
- The Greenhouse Effect: CC: [https://commons.wikimedia.org/wiki/File:Earth%27s_greenhouse_effect_\(US_EPA_2012\).png](https://commons.wikimedia.org/wiki/File:Earth%27s_greenhouse_effect_(US_EPA_2012).png)
- Cold at high altitude: Cold at high altitude – CC - <https://www.maxpixel.net/Climb-Adventure-Altitude-Cold-Daylight-Frost-1867855>
- Mountaineering – CC - <https://pxhere.com/en/photo/1160362>
- Air movement: CC - https://commons.wikimedia.org/wiki/File:Otto_3275_Upward_air_movement.jpg
- Atmospheric Gases - <https://openclipart.org/download/192524/1396695680.svg>
- Atmospheric layer: CC - <https://pixabay.com/vectors/diagram-earth-sun-atmosphere-layer-29982/>
- Happy girl: CC - <https://www.publicdomainpictures.net/en/view-image.php?image=75711&picture=happy-stick-girl-clip-art>

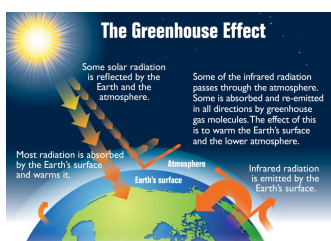
- Tree: CC - <https://www.goodfreephotos.com/vector-images/colorful-natural-tree-vector-clipart.png.php>
- Leaf – CC - <https://pixabay.com/illustrations/foliage-graphics-leaf-illustration-1456927/>
- Troposphere--OC: Madhumita Dinesh – Madhumitadinesh@gmail.com
- Atmospheric layers: CC - <https://openclipart.org/detail/182308/atmosphere-layers>
- Aurora borealis/Northern lights: CC - <https://pixabay.com/photos/aurora-borealis-night-948998/>
- Radio transmission: CC - <https://pixabay.com/vectors/tower-antenna-radio-wireless-31235/>

Time to teach	Asset Type	Theme	SubTheme
15 Minutes	Main Script	Solar system & the earth	Atmosphere, Atmosphere

5. Imbalances in Atmosphere

A favourable environment for life

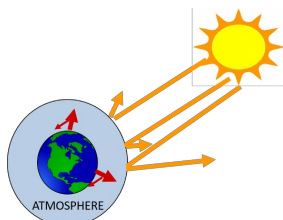
- Of the energy received from the sun, some is reflected back, and the balance is absorbed by the greenhouse gases, which in turn re-emits it as heat.
- This natural greenhouse effect creates a hospitable temperature on earth that is suitable for life.
- The incoming and outgoing energies are carefully balanced and any changes can affect the climate.



Pic:Greenhouse effect

Warming due to imbalances

- Any addition of greenhouse gases to the atmosphere traps more heat-- whether naturally occurring like CO₂, methane and nitrous oxide, or manmade like chlorofluorocarbons.
- Scientific studies have shown a sharp increase in atmospheric CO₂ since the late 19 C. An increase in global temperatures has also been confirmed beyond doubt.
- The greenhouse gases emitted due to human activities change the earth's energy balance.



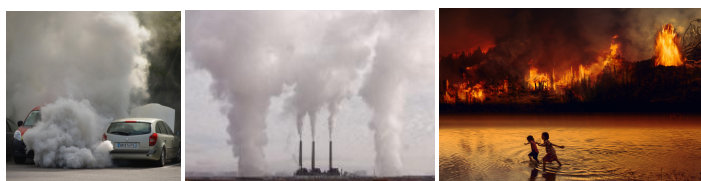
Imbalances caused by human activity

- Of the increase in greenhouse gases due to human activities, CO₂ is most responsible for rise in temperature.
- Human activities that affect the atmosphere include land-use patterns, such as clearing forests for agricultural land, and industrial and vehicle emissions.

In a global tragedy, the rich Amazon forests in South America are being burned deliberately by humans greedy for farming purposes.

They are irreplaceable as they are the world's carbon sinks protecting us by absorbing our excess carbon from the atmosphere, apart from many other innumerable benefits given to us by these rich forests.

- There is a clear increase in concentration of 'old' carbon from burning fossil fuels, as against the 'new' carbon emitted by living forms.



Pics: Car emissions, Factory smoke & Forest fire

Some of the human activities and resulting greenhouse gases in the troposphere include:

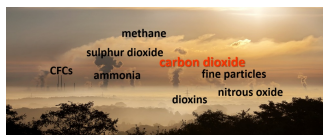
*fossil fuel burning--CO₂

*deforestation--less CO₂ absorbed, and more released when trees are burned

*livestock production--methane

*fertilizer use—nitrous oxide

*Industrial processes—chlorofluorocarbons etc



Pic: Sunrise with fog

Thinning of ozone layer

- The ozone in the stratosphere absorbs the sun's harmful ultraviolet (UV) rays before it reaches the earth.
- High levels of these UV rays can cause skin cancer and is believed to suppress the immune system in humans.
- Rising concentrations of chlorofluorocarbons, a manmade industrial chemical used in refrigerators and aerosol sprays, react with, and reduce, the protective ozone in the stratosphere. CFCs are now banned, but the ozone holes created will take decades to heal.



Pic: Ozone layer

Atmospheric imbalance due to human activity has been undeniably linked to global warming.

Image sources:

- Greenhouse Effect - [https://commons.wikimedia.org/wiki/File:Earth%27s_greenhouse_effect_\(US_EPA,_2012\).png](https://commons.wikimedia.org/wiki/File:Earth%27s_greenhouse_effect_(US_EPA,_2012).png) – CC – Greenhouse effect
- Globe – CC - <https://pixabay.com/vectors/globe-world-earth-continent-297342/>
- Sun – CC - <https://www.goodfreephotos.com/vector-images/cartoon-sun-vector-art.png.php>
- Car emissions – CC - <https://pixabay.com/en/car-non-panne-bad-luck-1411313/> - CC0
- Factory smoke – CC - <https://pixabay.com/en/pollution-factory-industry-smoke-2575166/>
- Forest fire - <https://pixabay.com/photos/fire-forest-fire-children-fear-4429478/>
- Sunrise with fog - CC - <https://pixabay.com/en/industry-sunrise-fog-germany-611668/>
- Ozone layer – CC - <https://pixabay.com/vectors/diagram-earth-sun-atmosphere-layer-29982/>

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Day-to-day Relevance	Solar system & the earth	Biosphere – The Domain Of Life, Biosphere – The Domain Of Life

6. SSG_06_05_13_MS_Continents

Continents

- On the earth's surface are 7 large landmasses of various sizes called continents
- They are separated from each other by expanses of water
- The Equator (0° latitude) divides the earth into the Northern and Southern Hemispheres, and the landmasses are mostly in the Northern Hemisphere



Pic: 7 Continents

ASIA



- Largest continent
- One-third of earth's total area covered by this continent
- Located mostly in the Northern, and entirely in the Eastern Hemisphere
- The Tropic of Cancer ($23^{\circ} 30' N$) passes through it
- The Ural Mountains separate this continent from Europe on the western side

Most of Russia, the world's largest country, is located here

- Though they are separate continents, Asia and Europe are together referred to as 'Eurasia'

EUROPE



- It is the second-smallest continent
- Located next to Asia, it is in the Northern Hemisphere
- The Arctic circle ($66^{\circ} 34' North$) runs through this continent
- Oceans or inland seas surround it on three sides, and land on the fourth side
- The smallest country - the Vatican City - is located here

AFRICA



- Second-largest continent
- Located mostly in the Northern Hemisphere, and is the only continent that lies in all four hemispheres
- The Equator passes through almost the middle of the continent
- The Tropic of Cancer, the Equator, and Tropic of Capricorn, all pass only through this continent
- The continent is surrounded by water on all sides-the Mediterranean Sea, the Atlantic Ocean and the Indian Ocean
- The world's largest hot desert - the Sahara, and the longest river - the Nile - are located here

NORTH AMERICA



- It is the third-largest continent
- Located entirely in the Northern and Western Hemispheres
- It is surrounded by the Pacific Ocean, the Atlantic Ocean, and the Arctic Ocean
- A thin strip of land, the Isthmus of Panama, connects it to the continent of South America

SOUTH AMERICA



- Fourth-largest in size

- Located mostly in the Southern Hemisphere
- The Pacific Ocean and Atlantic Ocean surround the continent
- It has the world's largest river - the Amazon, the highest uninterrupted waterfall - the Angel Falls, and the longest mountain range - the Andes - which stretches along the length of the continent

AUSTRALIA



- This is the smallest continent
- Completely in the Southern Hemisphere
- Often referred to as 'Island Continent' since it is entirely surrounded by sea

ANTARCTICA



- It is located entirely in the Southern Hemisphere
- Covered throughout the year by thick layers of ice
- Almost at the centre of this landmass lies the South Pole
- Due to harsh weather conditions, permanent human settlements are not there.

Temporary settlements have been established by countries mainly for research purposes.

India has 2 research stations called Maitri and Dakshin Gangotri in Antarctica.

Continents in descending order of size:

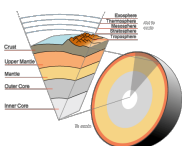
Asia, Africa, North America, South America, Antarctica, Europe and Australia.

Image sources:

- Map of 7 Continents – SSSVV gallery, (Keyword: continents)
- Map of Asia– CC-<https://pixabay.com/illustrations/map-map-of-the-world-relief-map-221210/>
- Map of Europe– CC-<https://pixabay.com/illustrations/map-map-of-the-world-relief-map-221210/>
- Map of Africa– CC-<https://pixabay.com/illustrations/africa-map-continent-south-america-1804896/>
- Map of North America – CC -<https://pixabay.com/illustrations/north-america-america-map-1804897/>
- Map of South America-CC-<https://pixabay.com/illustrations/map-map-of-the-world-relief-map-221210/>
- Map of Australia – CC-<https://pixabay.com/illustrations/asia-india-nepal-australia-1804902/>
- Map of Antarctica – SSSVV gallery < Keyword-Antarctica>

Time to teach	Asset Type	Theme	SubTheme
7 Minutes	Main Script	Resources	Components of Environment, Components of Environment

7. Lithospheric plates



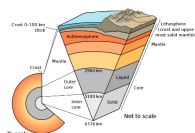
Pic: Earth's crust

Lithospheric plates

The outermost layer of the earth, the crust, and the upper layer of solidified mantle are together called the Lithosphere.

It floats on the underlying viscous part of the mantle, the Asthenosphere.

The Lithosphere is split into several lithospheric plates or tectonic plates, which are of two types- continental plates and oceanic plates.



Pic: Earth layers

- Both types of plates are constantly moving due to movement of the hot liquid magma under it. This is how under the Continental Drift theory, with the movement of the plates the continents have shifted position over time, and appear to have moved relative to each other.
- The plates move very slowly, but have a great mass, and when they collide, the force of collision is enormous enough to create landforms.
- These changes in landforms can take place slowly over millions of years, like mountains, or very quickly, in a matter of minutes, such as land created by volcanic activity.

Continental plates

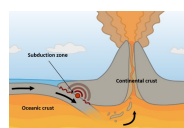
- Continental plates float on the mantle creating the land which we live on.
- The continental crust is thickest where the tall mountain ranges stand.
- These plates are rarely destroyed or recycled which is why they are very old.



Pic: Convergent boundary

Oceanic plates

- The oceanic plates exist under the oceans.
- They are more dense than the continental plates.
- They are constantly being renewed when fresh magma wells up from gaps in the ocean floor, and being destroyed when it subducts under the continental plate during collision.
- This is why they are much younger than the continental plates.



Pic: Destructive plate margin

Differences

		Oceanic plate	Continental plate
1.	Position	Found under the oceans	Floats higher on the mantle giving us dry land
2.	Age	Much younger, less than 200 million years old, since it is constantly being renewed. Newest rocks found here.	Older, upto 1500 million years old, since they are rarely destroyed. Oldest rocks in the world found on land.
3.	Thickness	Thinner, 5-10 kms	Thicker, 35-70 kms
4.	Area	Covers a larger surface area, about 70% of total surface	Less in area, about 30%
5.	Density	More dense, hence when oceanic and continental plates collide, it is the oceanic plate that normally goes under or subducts.	Less dense, hence floats
6.	Composition	Made of denser basalt	Made of less dense granite
7.	Buoyancy	Does not float or move much in the magma.	Floats more freely on the underlying molten magma

Image sources

- CC – Earth's crust <https://commons.wikimedia.org/wiki/File:Earth-crust-cutaway-english.png>
- Earth layers: CC - https://en.wikipedia.org/wiki/Plate_tectonics#/media/File:Earth-cutaway-schematic-english.svg
- Convergent boundary – CC - https://commons.wikimedia.org/wiki/File:Active_Margin.svg
- Destructive plate margin – CC - https://commons.wikimedia.org/wiki/File:Destructive_plate_margin.png

Time to teach	Asset Type	Theme	SubTheme
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5 Minutes	Interesting Asides	Solar system & the earth	Lithosphere, Lithosphere
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8. 7 continents

Aim : The students will demonstrate a detailed understanding of the 7 continents.

Resources required:

Each group will require

1. Chart-1 no.
2. Outline political map of the world- 2 nos.
3. Relevant pictures (2 or 3 pictures representative of each continent)
4. Felt pens/colour pencils/ scale/glue/scissors

All the material, whether provided by teacher or brought by students, should be deposited with the teacher a day prior to the activity.

Setting for the activity:

Indoor

Type of activity:

Project

Procedure:

1. Before the day of the activity:

In an earlier class the teacher can discuss the project in detail and asks the students to bring the required materials.

The teacher will divide the students into groups of 3 students each, depending on class strength.

2. On the day of the activity:

Each group will create an attractive chart on 7 Continents.

- The teacher will distribute the materials to the students. The maps have to be stuck on the chart in the following format:

- **MAP 1:** On one outline map, each continent will be coloured with a different colour. The continents and oceans should be clearly labeled in this one.

The chart can be titled '7 CONTINENTS' and this coloured outline map (MAP 1) can be stuck on the chart, under this title. This map should not be cut.

- **MAP 2:** Repeat the same colours on the second map (MAP 2), and the continents alone can be named. Cut out the continents from this map.

- On the chart, underneath MAP 1, please stick the 7 continents that were cut out, one after the other, in descending order of size. i.e., the largest continent will feature first, and end with the smallest continent.

- Under each continent outline, the name of continent should be written.

Under each name, five unique features of the continent should be listed, followed by 2 or 3 pictures (with captions) representative of the continent (such as people, wildlife, trees or flowers etc).

The pictures need not be of the listed five unique features.

Observation:

The students will be able to exhibit an understanding of the different continents, differentiate between their relative sizes, and list the unique features of each.-

Conclusion:

This activity will help the students gain a detailed understanding of the different continents.

Instructions to Teacher:

1. The teacher can guide the students about what features they can include under each continent:

• Unique features to be listed can include size, time zones, mountains/ volcanoes, rivers, cold and hot deserts, the oceans around it, whether it is an island, whether Tropic of Cancer/ Capricorn or Equator pass through it, human settlements-or lack of it, or any interesting fact. These do not have to be accompanied with pictures.

• Pictures can be anything representative of the continent e.g. Canada's symbolic maple leaf can represent North America, Eiffel tower can represent Europe, an African tribe can represent Africa...and so on.

2. On the activity day, teacher can observe, and guide where necessary.

Precautions: Care should be taken while cutting out each continent from MAP 2.

Image sources:

• Pens – CC- <https://pixabay.com/en/ballpoint-pen-pens-black-writing-41163/>

Pencil – CC- <https://pixabay.com/en/pencil-green-eraser-write-school-308560/>

Coloured Pencils – CC- <https://pixabay.com/en/colored-pencils-pens-colour-pencils-3141510/>

Eraser- CC- <https://pixabay.com/en/eraser-office-supplies-office-795771/>

Scale- CC- <https://pixabay.com/en/the-ruler-wooden-ruler-setsquare-1970655/>

Glue – CC- <https://pixabay.com/en/school-back-to-school-education-2596090/>

Scissors – CC- <https://pixabay.com/en/a-pair-of-scissors-red-office-paper-3314438/>

World map – CC - <https://pixabay.com/illustrations/africa-america-antarctica-art-asia-1356782/>

- Children in a classroom: CC - <https://pixnio.com/people/children-kids/these-children-at-a-school-in-turkestan-city-are-participating-in-a-national-reading-day>
- Africa – SSSVV Gallery https://www.srisathyasaividyavahini.org/alfresco/d/direct/workspace/SpacesStore/89216f36-76ef-4d3b-8b05-cb110038e08f/continents-africa-3764?ticket=TICKET_b095ad7ba24b78d65dd1c7d60d7e75477903491e
- Asia – Asia – SSSVV Gallery - https://www.srisathyasaividyavahini.org/alfresco/d/direct/workspace/SpacesStore/86e430c7-780d-40e9-94ae-ef9c527c8c4a/maps-3766?ticket=TICKET_b095ad7ba24b78d65dd1c7d60d7e75477903491e
- Australia – SSSVV Gallery - https://www.srisathyasaividyavahini.org/alfresco/d/direct/workspace/SpacesStore/0a44d0e7-7871-4039-a2a3-c0e7dc5c8261/continents-australia-map-maps-continent-map-oceans-3767?ticket=TICKET_b095ad7ba24b78d65dd1c7d60d7e75477903491e
- Australia collage – CC - <https://pixabay.com/photos/australia-collage-images-iconic-2124158/>
- Africa collage – CC - <https://pixabay.com/illustrations/collage-africa-big-5-animals-lion-1803066/>
- USA montage – CC - <https://pixabay.com/illustrations/new-york-collage-usa-city-travel-1491106/>
- North America map – North America map – SSSVV Gallery - https://www.srisathyasaividyavahini.org/alfresco/d/direct/workspace/SpacesStore/e446a760-b4a5-401f-8ef7-36038443c3ae/map-3768?ticket=TICKET_b095ad7ba24b78d65dd1c7d60d7e75477903491e
- Pyramids – SSSVV Gallery - https://www.srisathyasaividyavahini.org/alfresco/d/direct/workspace/SpacesStore/06df48ee-aac7-46ab-878a-a35c07a861a7/pyramids-8126?ticket=TICKET_b095ad7ba24b78d65dd1c7d60d7e75477903491e
- Maple leaf – CC - <https://pixabay.com/vectors/canada-flag-leaf-maple-153552/>
- Eiffel tower – CC - <https://pixabay.com/photos/paris-france-eiffel-eiffel-tower-1175022/>
- African tribal hut – CC - <https://pixabay.com/photos/south-africa-tribe-hut-traditional-949488/>
- Argentina football – CC - <https://pixabay.com/illustrations/world-russia-russia-2018-flag-3498763/>
- Girl – CC- <https://pixabay.com/en/burma-myanmar-peace-mediate-2288964/>
- boy– CC- <https://pixabay.com/en/burma-myanmar-peace-mediate-2288964/>
- Yellow paper – CC- https://commons.wikimedia.org/wiki/File:Solid_yellow.svg
- Square Orange – CC - https://en.wikipedia.org/wiki/File:LACMTA_Square_Orange_Line.svg

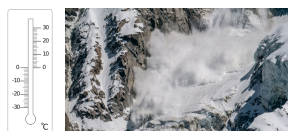
Time to teach	Asset Type	Theme	SubTheme
15 Minutes	Suggested Activity	Solar system & the earth	Biosphere – The Domain Of Life, Biosphere – The Domain Of Life

9. SSG_06_05_15_IA_Climbing Mount Everest

Climbing Mount Everest



Pic: Mount Everest



Pics: Zero temperature, avalanche

- Rising 8,850m above sea-level, Mount Everest is the highest mountain on earth.
- Climbing Mt Everest is very dangerous due to conditions such as sub-zero temperatures, lack of oxygen and the risk of avalanches.
- It demands extraordinary courage, physical endurance and mental strength from climbers.
- While many experienced mountaineers have failed in their attempts to climb this majestic mountain that has claimed many lives, several successful attempts have also been made.



Pic: Edmund Hillary & Tenzing Norgay

- Edmund Hillary (New Zealand) and Tenzing Norgay (Nepal) were the first to reach the summit in 1953.



Pics: Reinhold Messner & Peter Habeler

- In 1978 Reinhold Messner (Italy) and Peter Habeler (Austria) were the first to reach the summit without using supplemental oxygen.



Pic: Mountaineers

- First disabled person to reach the summit was Tom Whittaker (USA).
- The first woman to climb to the top of the mountain was Junko Tabei (Japan) in 1975.
- The oldest man to reach the summit was 80-yr-old Yuichiro Miura in 2013, and the oldest female was 73-yr-old Tamae Watanabe.
- Climbers as young as 13-year-old Jordan Romero (USA) and Malavath Purna (India) have climbed the mountain.

Our Indian record-holders

- Avtar Singh Cheema- the first Indian
- Bachendri Pal- the first Indian woman
- Nima Wangchuck- the oldest Indian, at 59 years
- Sangeeta Sindhi Bahl- the oldest Indian woman at 53 years
- Arunima Sinha- the world's first female amputee



Pics: Bachendri Pal, Arunima Sinha (3rd from right)

To date, only about 5000 people have climbed the mountain.

Image sources:

- Mount Everest – CC - <https://pixabay.com/photos/mountain-mount-everest-himalaya-1246297/>
- Zero temperature: CC – <https://pixabay.com/illustrations/thermometer-temperature-weather-4695208/>
- Avalanche – CC - <https://pixabay.com/photos/mountain-avalanche-snow-mont-blanc-4254821/>
- Edmund Hillary & Tenzing Norgay – CC - <https://flickr.com/photos/viaggiaroutard/33334720976/in/photolist-H3uprv-qjNSvV-2ibciCr-JoaX7E-SMFaby-JyNKM5-K3dRs5-djFkH8-26Gkd6c-PRApx9-djFqSX-265scqE-H3upyp-23WD74f-ccQPTN-7NdAqs-JyNKTu-2g5hdpq-u8QPh-skDpv3-Cijt5C-u8QFJ-bVtxPD-D9jUB7-aAKURw-25NrPiR-26sMTe7-27yJz74-27yJyWe-26sMTmw-26sMTu7-27yJzeD-26sMTol-24NVXF9-fdhbfu-pt7ZYe-F2juIF-2gc6Aon-Hg5qzL-2gc6gkp-GKKroA> Attribution- Viaggio Routard
- Reinhold Messner – CC - <https://pixabay.com/photos/reinhold-messner-reinhold-messner-1646687/>
- Peter Habeler – CC - https://commons.wikimedia.org/wiki/File:Peter_Habeler.jpg Attribution- Kuba Turek
- Mountaineers – CC - <https://pixabay.com/photos/rock-climbing-snow-ice-mountaineers-4364081/>
- Indian Flag: <https://pixabay.com/photos/indian-flag-tricolor-india-flag-3607410/>
- Bachendri Pal: https://en.wikipedia.org/wiki/Bachendri_Pal#/media/File:Padma_Bhushan_Bachendri_Pal.jpg Attribution: President's Secretariat (GODL-India)
- Arunima Sinha: https://commons.wikimedia.org/w/index.php?title=Special:Search&redirs=0&search=arunima%20sing&fulltext=Search&ns0=1&ns6=1&ns14=1&title=Special:Search&advanced=1&fulltext=Advanced%20search#/media/File:Ms._Arunima_Sinha_and_other_members_of_Women_Eco_Expedition_Challenge_meeting_the_Union_Home_Minister,_Shri_Rajnath_Singh_before_leaving_to_Russia_to_climb_Mount_Elbrus_from_19_July,_2014,_in_New_Delhi_on_July_18,_2014.jpg Attribution: Ministry of Home Affairs (GODL-India)

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Interesting Asides	Resources	Natural Environment , Natural Environment

10. SSG_06_05_12_MS_Biosphere

Biosphere

- Biosphere is the thin layer on earth which supports life. It is only on earth that life exists.
- Here the Lithosphere, Hydrosphere and Atmosphere interact closely to create a zone of inter-dependence.



Pic: Landscape

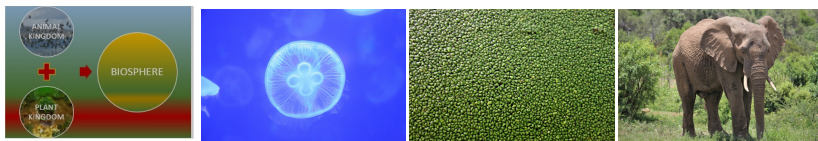
- In this zone all living organisms, and their environment on which they depend for their survival, can be found.
- Living organisms are closely connected to each other and to their environments.
- Living organisms depend on each other for survival.



Pic: Environment components

The domain of life

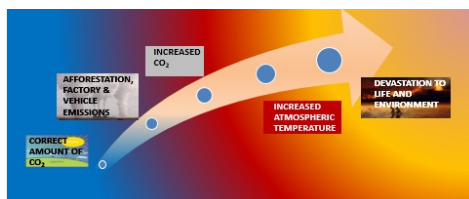
- The living organisms that exist in this domain range from tiny organisms that can be found in the deepest parts of the ocean, sea and land animals, right upto a few kilometres in the skies. Examples of the biosphere lifeforms include the primitive jellyfish; wolffia which is the smallest flowering plant; and the largest land animal, the African elephant.



Pics: Flock of geese, earth, jellyfish, wolffia, African elephant.

Interdependence

- Any manmade or natural action in one domain, affects the other domains
- E.g. burning of fossil fuels, factory emissions and deforestation can lead to increased greenhouse gases such as carbon dioxide, which in turn leads to higher atmospheric temperatures.
- This has a devastating effect on living creatures and their environment,



Pics: Balanced environment, factory emissions, forest fire

Image sources:

Landscape – CC - <https://pixabay.com/photos/landscape-river-plain-horizon-4433837/>

Environment components- SSSVV Gallery – Biosphere reserve

https://www.srisathyasaividyavahini.org/alfresco/d/direct/workspace/SpacesStore/808f7398-5667-40e4-b6fb-657382b1a727/biosphere-reserve-7399?ticket=TICKET_f5dd6869fcc2aa7e8c170f27c430d8b098ce94de

Flock of geese – CC: <https://pixnio.com/fauna-animals/birds/goose-pictures/mixed-goose-flock-in-flight>

Earth - CC: <https://www.maxpixel.net/Ecology-Nature-Conservation-Environmental-Protection-326923>

<https://pixabay.com/photos/jellyfish-small-animals-marine-2334864/>

<https://pixabay.com/photos/duckweed-wolffia-globosa-pond-water-1468049/>

<https://pixabay.com/photos/african-elephant-bull-thick-skin-4689572/>

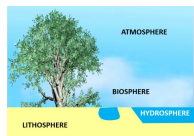
Balanced environment: Correct amount of CO2: CC - <https://pixabay.com/vectors/diagram-earth-sun-atmosphere-layer-29982/>

Factory smoke – CC - <https://pixabay.com/en/pollution-factory-industry-smoke-2575166/>

Forest fire: CC: <https://pixabay.com/photos/fire-forest-fire-children-fear-4429478/>

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Main Script	Resources	Components of Environment, Components of Environment

11. Biosphere



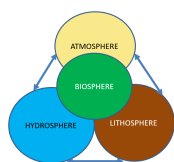
Pic: Four domains of earth

1. What relation does the biosphere have with the other three domains?

Ans.: It is in the small and relatively thin biosphere that all three domains, the atmosphere, lithosphere, and the hydrosphere come together to create an environment in which life can exist.

The domains interact with each other and have an effect on each other.

E.g. Water from the Hydrosphere evaporates and enters the Atmosphere as water vapour, to fall as rain on the Lithosphere, from where it eventually finds its way back into the Hydrosphere.



2. Why is the sun important in the biosphere?

Ans.: The heat of the sun is filtered through the atmosphere and reaches earth to create a hospitable environment at a temperature that makes life possible. The energy from the sun is captured by the plants and in the process of photosynthesis transforms carbon dioxide to food and life-giving oxygen. The phytoplankton in the ocean also uses photosynthesis to convert Carbon dioxide to complex sugars, providing food, and oxygen. The heat of the sun evaporates the ocean water and this water vapour falls as rain on land, giving and sustaining life to flora and fauna.



Pic: Sun and biosphere

3. If one of the three domains were to be removed from the Biosphere, what do you think the effect would be of having only the other two domains?

a) Imagine the effect if Lithosphere were to be removed from the Biosphere....

Ans.: a) If we remove the Lithosphere, there will be no dry, solid land. Even the oceans, which have the lithosphere as their base, will not exist. All the flora and fauna of the lithosphere would not exist. The level of oxygen would be reduced since the plants on land and sea will not be producing it through photosynthesis, and carbon dioxide levels will be high causing temperatures to increase. The wonderful diversity of landmasses that contribute to different weather, and the diversity in plant and animal life, would not be possible. Life itself could not exist.



Pic: Birds

b) Imagine the effect if Atmosphere were to be removed from the Biosphere....

Ans.: b) If we remove Atmosphere, the air we breathe which is the very foundation of life would be removed. Without oxygen life cannot exist at all in the Lithosphere or the Hydrosphere. There will be no protective buffer between the harmful ultra-violet rays of the sun, as also its intense heat. Life, as we know it, will not be able to exist on earth.



Pic: Protected nature

c) Imagine the effect if Hydrosphere were to be removed from the Biosphere....

Ans.: c) If the Hydrosphere were to be removed, only the Lithosphere and the Atmosphere would remain. All water-bodies would not be there. Even the water vapour in the air would not be renewed. Again life would be impossible to sustain without life-giving water.



Pic: Biosphere reserve

Image sources:

- Four domains of earth: OC-mudambisowmya@gmail.com
- Sun and biosphere: <https://pixabay.com/illustrations/climate-ecosystem-earth-1471439/>
- Birds illustration: <https://www.publicdomainpictures.net/en/view-image.php?image=248455&picture=birds-clipart-illustration>
- Protected nature: <https://www.maxpixel.net/Ecology-Nature-Conservation-Environmental-Protection-326923>
- Biosphere reserve: https://www.srisathyaivaividyaahini.org/alfresco/d/direct/workspace/SpacesStore/808f7398-5667-40e4-b6fb-657382b1a727/biosphere-reserve-7399?ticket=TICKET_b095ad7ba24b78d65dd1c7d60d7e75477903491e

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Inquisitive Questions	Solar system & the earth	Biosphere – The Domain Of Life, Biosphere – The Domain Of Life

12. Global warming and biosphere



Pic: Global warming

Greenhouse effect and Global warming

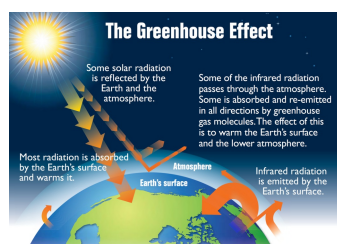
- Some gases in the atmosphere such as carbon dioxide, methane and nitrous oxide, act like a protective cover trapping the heat, and raising the temperature on earth more than it would be otherwise. This is very much like a greenhouse that is used in colder climates to grow plants requiring a warmer temperature.

Without this greenhouse effect earth would be colder and mostly uninhabitable.

- However, if these gases increase, more and more heat will be trapped, resulting in global warming, with a devastating effect on the biosphere.

Increase in these gases can happen due to direct human activity, such as emissions from industries, power plants and vehicles.

Extreme weather conditions is linked to global warming.



Pic: Greenhouse Effect

Effects of global warming in the biosphere

- Ice melt

- When the temperature on the Earth's surface rises, weather patterns across the globe are affected.
- The polar ice caps are melting, raising the water levels in the oceans.
- Higher temperatures are causing sea ice and mountain glaciers to melt and shrink; spring is arriving earlier and along with it early snowmelt and increased growth of vegetation in the area.

E.g Peru's Cordillera Blanca, the world's highest tropical mountain range has lost a substantial part of its glaciers since 1970 when monitoring first started.



Pic: Polar bear on shrinking ice

Oceans

- Rising water levels will inundate much of the highly-populated coastal areas, threatening the human settlements there.

Apart from human beings, flora and fauna will also be affected.

E.g. The rare but vital mangrove reserves in the Sundarbans would be submerged if the sea level were to rise, impacting many endangered species such as the Bengal tiger and the estuarine crocodile.

- Higher water temperatures and acidification when the water absorbs carbon dioxide, will impact marine organisms.

Acidification prevents corals from building their skeletons, and shelled fish, such as oysters and mussels, from making strong protective shells. Coral bleaching, in which corals reject the algae which lives in them, has been seen in many parts of the world, such as the Great Barrier Reef of Australia.



Pics: Flooded city and Sundarbans mangroves

Land

- In warmer areas, green cover has actually declined due to insect infestations, wildfires and increased drought.
- Higher temperatures create drier vegetation resulting in more intense wildfires, devastating large areas of land along with its flora and fauna.
- More carbon dioxide is also released into the atmosphere when trees, which are mainly carbon, are burnt.

E.g California had its most destructive wildfire season in 2018 with large areas of vegetation destroyed.

Europe is struggling with heatwaves and record-breaking temperatures in UK, Belgium, Germany and Netherlands.

Sometimes destruction is the direct result of human greed such as the tragic loss of the rich and irreplaceable Amazon forests in South America which are being burned deliberately by humans to clear the land for farming. These protect us by absorbing our excess carbon from the atmosphere, apart from many other innumerable benefits given to us by these rich forests.



Pics: Drought and wildfires

Birds and animals

Migrations of animals and birds, a natural event, can happen at incorrect times. Food for animals can become scarce, and very young animals may not be able to survive the increased temperature and dryness. Pest infestations increase in warmer temperatures. Tree leafing happens earlier than it should, disturbing the eco-system; caterpillars that feed on the young leaves hatch very much earlier than the chicks that feed on it, depriving them of food. Many species of plants and animals will not be able to migrate to more comfortable temperatures, or adapt to the new temperatures, leading to their extinction.

E.g. Malaria is found further North than earlier as temperatures rise and the range for mosquitoes widens. Atlantic mackerel are found in abundance now further North near Iceland, where the waters were previously too cold for them.



Pic: Bar-tailed Godwit and mosquito

Climate and weather

Extreme weather - such as unusually hot summers or very cold winters, or hurricanes, droughts and storms - is a result of global warming.

E.g the devastating Hurricane Katrina, 2005, which claimed 2000 lives, and Northern Europe's heatwave in 2018.



Pic: Indicators of global warming

Image sources:

- Global warming CC - <https://pixabay.com/illustrations/climate-change-global-warming-2063240/>
- Greenhouse Effect- [https://commons.wikimedia.org/wiki/File:Earth%27s_greenhouse_effect_\(US_EPA,_2012\).png](https://commons.wikimedia.org/wiki/File:Earth%27s_greenhouse_effect_(US_EPA,_2012).png)
- Polar bear on shrinking ice- <https://pixabay.com/illustrations/global-warming-polar-bear-1356567/>
- Flooded city: CC – Submerged city - https://en.wikipedia.org/wiki/File:KatrinaNewOrleansFlooded_edit2.jpg
- Sundarbans mangroves– CC - <https://pixabay.com/photos/mangroves-sundarbans-swamp-forest-1225668/>
- Drought-- CC – Drought - <https://www.maxpixel.net/Dry-Summer-Drought-Global-Warming-Dehydrated-1029329>
- Wildfires--CC -- By U.S. Department of Agriculture - Flickr: 20130817-FS-UNK-0004, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=27895421>
- Bar-tailed Godwit: CC - https://en.wikipedia.org/wiki/File:Bar_tailed_Godwit24.jpg
- Mosquito – CC - <https://pixabay.com/illustrations/female-mosquito-malaria-bug-pest-1007784/>
- Indicators of global warming: CC - https://commons.wikimedia.org/wiki/File:Diagram_showing_ten_indicators_of_global_warming.png

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Interesting Asides	Solar system & the earth	Biosphere – The Domain Of Life, Biosphere – The Domain Of Life

13. Effect of global temperature increase on migratory birds

Why birds migrate

- Birds **migrate annually** due to many reasons, but primarily for nesting and feeding; they move from places with less resources to those with greater resources, in spring and autumn.
- Their **amazing navigational ability** over extremely long distances has evolved over several thousands of years, enabling even first-time migrants to travel across continents without ever having seen their destination.



Pic: Flock of geese

Conditions needed along the migratory path

- A set of **favourable conditions are required** at every phase of their annual migration; at the nesting and non-nesting locations, and on the stopovers along their migratory route.
- **Global warming** can impact these conditions, for instance, if the first leaves on a tree were to arrive before time due to higher temperatures, it impacts the life-cycle of insects which are the primary food source for birds. Caterpillars can turn into moths early depriving birds of food when they arrive.
- Higher oceanic temperatures can raise sea levels submerging coastal breeding grounds and their eco-systems, leaving the migrant birds with loss of nesting grounds and food after their long journey.



Pics: Tender tree leaves & Butterfly and caterpillar

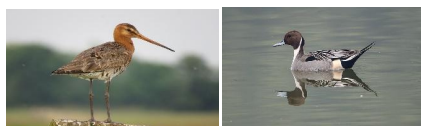
Global warming affects India, an important stop on migratory path

- In India the arrival of migratory flocks like gulls, waders, plovers, and terns during autumn is an **important natural event**.
- The lakes, marshy wetlands and coasts provide **rich feeding and breeding grounds** for migratory birds.
- However global warming has raised winter temperatures, and the numbers of **migratory birds are declining**.
- **Arrival times have changed** with some species arriving earlier, and others later. By arriving at their breeding grounds at an incorrect timing, birds can miss out on food and nesting places, affecting the timing of their chicks hatching as well as their nourishment and survival.



Pics: Black Back gulls, Wader & Tern

- Winters at the Chilka Lake on India's eastern coast, were cold and foggy earlier, allowing birds migrating from the freezing regions-- sometimes as far away as Alaska and Iceland-- to **adjust slowly to a new temperature**.
- But a **higher temperature with fluctuating rainfall** that alters the quality of the brackish water, has resulted in declining migrant birds, such as the Black-tailed Godwit from Siberia and the Northern Pintail Ducks.



Pics: Black-tailed Godwit & Northern Pintail

- Due to unseasonal warming, birds whose breeding calls were heard in March are now being heard in January.
- The numbers of Demoiselle Cranes arriving at Saurashtra have declined.
- The Kangra wetlands in Himachal Pradesh used to host the largest single congregation of Bar-headed Geese in the world; in 2018, these highest-flying iconic birds, able to fly across the Himalayas, were substantially less than that of the previous year.



Pics: Demoiselle cranes & Bar-headed goose

We can see that global warming has altered the migratory patterns of many species of birds.

Image sources:

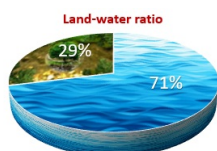
- Flock of geese – CC - <https://pixnio.com/fauna-animals/birds/goose-pictures/mixed-goose-flock-in-flight>
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- Butterfly and caterpillar: CC - <https://www.publicdomainpictures.net/en/view-image.php?image=3549&picture=butterfly-life-cycle>
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- Wader – CC: <https://pxhere.com/en/photo/1395312>
- Tern – CC - <https://pixnio.com/fauna-animals/birds/tern-birds-pictures/roseate-tern/roseate-tern-bird-calling>
- Black-tailed Godwit: CC - <https://pixabay.com/photos/black-tailed-godwit-bird-nature-3648526/>
- Northern Pintail – CC - [https://commons.wikimedia.org/wiki/File:Northern_Pintail_\(16264467046\).jpg](https://commons.wikimedia.org/wiki/File:Northern_Pintail_(16264467046).jpg) under *Creative Commons Attribution 2.0 Generic*
- Demoiselle cranes: CC - <https://pixabay.com/photos/bird-crane-demoiselle-crane-3985900/>
- Bar-headed goose: CC - <https://pixabay.com/photos/bar-headed-geese-goose-anser-indicus-277048/>

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Day-to-day Relevance	Solar system & the earth	Biosphere – The Domain Of Life, Biosphere – The Domain Of Life

14. SSG_06_05_14_MS_Hydrosphere

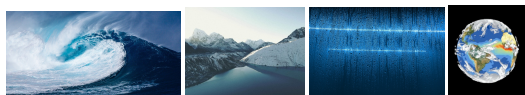
Hydrosphere

- About two-thirds of our planet is covered in water.
- This sphere of water on earth is called the Hydrosphere.



All forms of water

- The Hydrosphere includes water in its three forms- water vapour found in the atmosphere, or as water and ice.
- Water is found on earth in the oceans, rivers, lakes, ponds, reservoirs, glaciers, ice sheets etc.



Pics: Wave, glaciers, water vapour, earth.

Blue planet

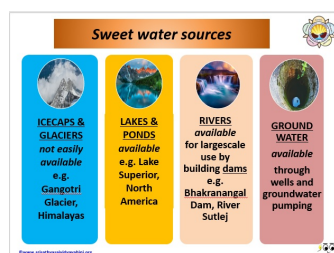
- Due to the large area of water, from space earth looks blue, and is often referred to as the “blue planet”.



Pic: Blue planet.

Salt water and sweet water

- Though there is an abundance of water on earth, most of it is in the oceans. E.g the Pacific Ocean, Atlantic Ocean, Indian Ocean, etc.
- The water in the oceans is too salty for human consumption.
- 97% of the water on earth is in the oceans, only 3% is sweet water.
- Sweet water which is suitable for human consumption, is found in freshwater lakes, rivers, and other water-bodies, or in frozen form as glaciers, or underground.
- Some of these sources are easily available, such as lakes, and some are not very available, such as glaciers.

**Image sources**

Landpic: <https://www.maxpixel.net/Ecology-Nature-Conservation-Environmental-Protection-326923>

Ocean wave: CC - <https://pixabay.com/photos/wave-atlantic-pacific-ocean-huge-1913559/>

Glacial lakes in Nepal – CC - <https://www.goodfreephotos.com/nepal/other/landscape-of-gokyo-lakes-in-nepal.jpg.php>

Water Vapour: <https://pixabay.com/photos/vapor-condensation-drops-water-4763904/>

Earth: CC - <https://www.flickr.com/photos/nasacommons/9464665031>

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Groundwater: <https://pixabay.com/photos/city-architecture-countryside-old-2939859/>

Underwater creatures: CC - <https://pixabay.com/illustrations/underwater-ocean-sea-water-nature-3740940/>

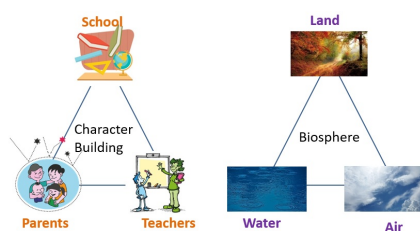
Time to teach	Asset Type	Theme	SubTheme
7 Minutes	Main Script	Resources	Components of Environment, Components of Environment

15. SSG_06_05_08_VC_Balance in Biosphere

Maintain a healthy balance of our Biosphere

The Biosphere is the narrow zone where we find land, water and air together, which contains all forms of life.

Parents, teachers and students together mould one's personality; just as the three zones of land, water and air - or the **Biosphere** - together support Life.



Pics: Working together- parents, teachers and students; land, water and air



Pics: Need to create the right balance

- This domain of life, unique to our planet, needs to be well protected.
- All human activities must keep in mind the ecological balance factor - a must for ideal living.
- Just like our bodies, the environment functions the best when it is balanced.
- None of the three zones should be under-used, over-used or misused.
- Parents and teachers can work together with students to reinforce the concept of balance through discussions on the topic, and practical day-to-day examples at home and at school

eg such as discouragement of use of plastic bags, switching off lights and fans when leaving the room etc.

Notes to the teacher: Ask the children following questions:

1. Can you suggest some simple steps to protect the bio-sphere today?

Teacher to help students arrive at the following answers.

Suggested answers:

- Carry your own cloth bags to the market.
- Try consciously to cut down on energy use.
- Plastic water bottles are tough on the planet, so use and re-use degradable bottles.
- Always use cloth towels, napkins and wipes instead of paper.

2. Name a few human activities that cause harm to the Bio-sphere.

Teacher to help students arrive at the following answers.

Suggested answers:

- Cutting of trees.
- Pollution of lakes and rivers.
- Emission from industries, vehicles and thermal plants
- Excessive use of chemicals in agriculture.
- Insufficient protection against natural calamities.

Every student should be aware of the dangers of wrong human activities and must consider it their duty to do their part, however small, to maintain a healthy balance of our Biosphere.

Madam Margaret Mead quotes, **"Never doubt that a small group of committed citizens can change the world, indeed, it's the only thing that ever has."**

Let us all be inspired to be one such citizen.

Image sources:

Parents - https://cdn.pixabay.com/photo/2016/06/15/18/15/family-1459586__340.png

Teacher - https://cdn.pixabay.com/photo/2017/11/07/23/55/teacher-2928817__340.jpg

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Hands-https://cdn.pixabay.com/photo/2016/11/19/11/11/hands-1838658__340.jpg

Drinking water-https://cdn.pixabay.com/photo/2015/01/12/03/00/drinking-water-597001__340.png

Water-https://cdn.pixabay.com/photo/2016/03/09/09/13/water-1245677__340.jpg

Time to teach	Value Type	Value Sub Type	Value Attribute
4 Minutes	Right Action		Open

16. Continents and oceans of the world

1. Match the following

1. Australia	a. Commercially busiest ocean
2. Arctic ocean	b. Africa
3. Amazon River	c. Smallest continent
4. River Nile	d. Surrounds North Pole
5. Atlantic ocean	e. South America
6. Indian Ocean	f. Largest ocean
7. Pacific Ocean	g. Triangular in shape

(Answers: 1-c, 2-d, 3-e, 4-b, 5-a, 6-g, 7-f)

2. Fill in the blanks

- The continent _____ has no time zones or permanent human settlements. (Ans. Antarctica)
- The Equator, Tropic of Cancer and Tropic of Capricorn all pass through the continent of _____. (Ans. Africa)
- Australia lies entirely in the _____ hemisphere. (Ans. Southern)
- The _____ Ocean is bound by Africa, India and Australia. (Ans. Indian)
- The _____ mountains separate Asia and Europe. (Ans. Ural)
- The latitude of Quito in Ecuador, S America, which is located on the Equator is _____ degrees. (Ans. 0)
- India's research stations on Antarctica are named _____ and _____. (Ans. Maitri and DakshinGagotri)



3. Short answer questions

1. List all continents in descending order of size.

(Ans. - Asia, Africa, North America, South America, Antarctica, Europe, Australia.)

2. What is the difference between an isthmus and a strait? Give examples of both.

(Ans. -An isthmus is a narrow strip of land connecting two large parts of land; it has water on either side, e.g the Isthmus of Panama connects North and South Americas, and is located between the Pacific and Atlantic Oceans.

A strait is a narrow water body connecting two larger bodies of water, normally with land on either side, e.g. the Bering Strait connects the Arctic Ocean with the Pacific ocean, and is located between Russia and Alaska.)



Pics: Panama Isthmus and Bering Strait

3. Describe the physiography of Antarctica.

(Ans. -

- Antarctica is the fifth largest in size among the continents.
- It lies completely in the Southern hemisphere, surrounding the South Pole.
- There are no time zones here.
- Thick ice sheets permanently cover almost the entire landmass.
- It is not only among the coldest places, but also the most windy and uninhabited.
- The only human settlements there are those of scientific research teams set up there by many countries.
- Maitri and Dakshin Gangotri are the two research stations of India on Antarctica.)



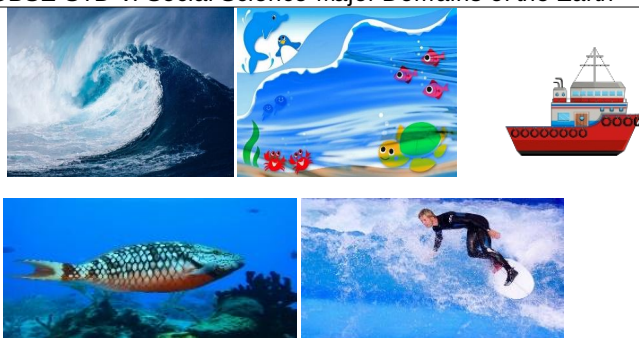
Pic: Antarctica-aerial view

4. Analytical question

- How do oceans affect the climate of earth? What other uses do they have for man?

(Ans.

- It regulates climate and weather by absorbing the heat from the tropics and carrying it to the Poles, and vice versa. Without this exchange many parts of the earth would be uninhabitable.
- It regulates rainfall since oceans hold most of the water supply of our planet.
- Oceans affect the air we breathe as it produces over half the world's oxygen. It absorbs CO₂ from the atmosphere keeping the temperatures in balance. and stores 50 times more carbon dioxide than our atmosphere.
- World trade is dependent on marine transportation for moving goods between countries.
- Man depends on the sea for much of his food and medicinal needs. Apart from seafood, he also consumes sea algae and plants.
- The many sea creatures play an essential role in our ecosystem.
- Recreational activities such as swimming, surfing and sailing.

**Image sources:**

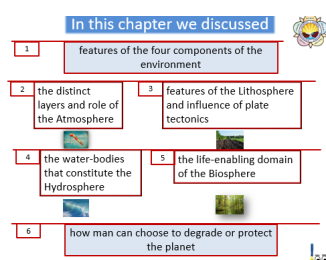
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- Africa:CC - <https://pixabay.com/illustrations/giraffes-south-africa-safari-africa-2713869/>
- Sydney Opera house: CC - <https://openclipart.org/detail/254600/sydney-opera-house>
- Panama isthmus:CC - https://commons.wikimedia.org/wiki/File:Panama_SRTM_Lrg.jpg
- Bering strait:CC - https://en.wikipedia.org/wiki/Bering_Strait_crossing#/media/File:BeringSt-close-VE.jpg
- Antarctica:CC - <https://www.maxpixel.net/South-Pole-Antarctica-Aerial-View-Continent-60608>
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- Fish:CC - <https://pxhere.com/en/photo/476138>
- Surfing:CC - <https://pixabay.com/photos/surfing-surf-surfboard-courage-817968/>

Time to teach	Asset Type	Theme	SubTheme
15 Minutes	Assessments	Solar system & the earth	Biosphere – The Domain Of Life, Biosphere – The Domain Of Life

17. SSG_06_05_16_Summary- Major Domains of the Earth**Summary - Major Domains of the Earth**

In this lesson we have discussed -

- how the earth has 4 components of the environment, each with unique features
- how the Atmosphere, which plays a protective role, has different and distinct layers
- the characteristics of the Lithosphere, and how plate tectonics determine the domain's characteristics
- how different types of water-bodies, including oceans and freshwater bodies, constitute the Hydrosphere
- the Biosphere is the life-enabling domain in which land, sea and water come together
- man has the ability and choice to degrade or protect the resources of the planet

**Image sources**

- Air image : <https://pixabay.com/photos/air-bag-wind-sock-weather-sky-1696481/>
- Earth crust image: <https://pixabay.com/photos/arable-field-landscape-agriculture-3442666/>
- Nature: <https://pixabay.com/photos/spreewald-channels-depth-trees-2749231/>
- Hydrosphere image: <https://pixabay.com/photos/surf-water-wave-sea-nature-3104869/>

Time to teach	Asset Type	Theme	SubTheme
2 Minutes	Main Script	Solar system & the earth	Lithosphere, Hydrosphere, Biosphere – The Domain Of Life, Atmosphere, Lithosphere, Hydrosphere, Biosphere – The Domain Of Life, Atmosphere