The Carbon Cycle

Let us follow the journey of a tiny atom of carbon from the atmosphere into the body of a little rabbit.

Scientists define an element as a pure substance consisting only of atoms having the same number of protons in their nuclei. This means that elements are not compounds, and therefore, they cannot be broken down into simpler substances. When we think about elements we should be able to understand that everything material is made up of these simple elements. The number of protons in the nucleus is the defining property of an element. In this chapter, we will explore about carbon atom which is an essential building block of living beings.

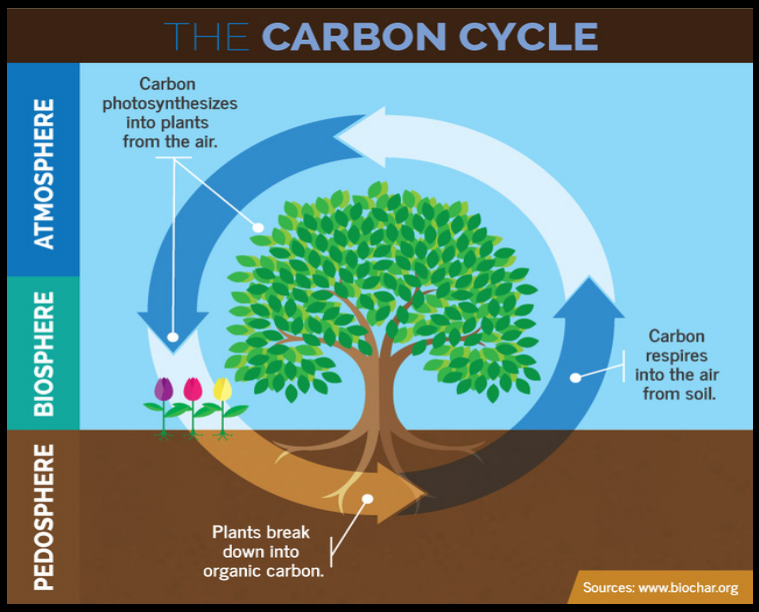
Let us follow the journey of a tiny atom of carbon from the atmosphere into the body of a little rabbit. To make it easier to follow the journey of the carbon atom from the atmosphere to the rabbit's body, we're going to name this tiny atom Carbo. Carbo, the carbon atom, will be joined by two of his Oxygen atom friends- Oxy1 and Oxy2- to make a molecule called- Carbon Dioxide.

Recall: A molecule is made of two or more atoms that are joined together by chemical bonds. Carbon dioxide is found in abundance in our atmosphere.

Carbo's Journey

Carbo, the carbon atom, and his two buddies Oxy1 and Oxy2, are huddled close together, floating high above the ground. Suddenly, a gush of wind pulls Carbo and his buddies down to Earth, where they are pulled through a tiny pore, called a stoma, found on the surface of a shiny blade of grass. Carbo and his buddies join other groups of atoms inside the leaf. Then, an unseen Force guides all the atoms into new groups of molecules. Carbo finds himself in a much larger group of atoms called a molecule. This one has 24 atoms! Do you know what molecule it is? (Hint- it's a sugar)

Out of nowhere, Carbo feels the sensation of being ripped away. He realises he is now inside the mouth of a rabbit. Now inside the rabbit's mouth, Carbo finds himself being tossed and turned in a warm liquid and once again, he is separated from some of his friends. After falling through a long, dark murky tunnel for what seems like an eternity, he finds himself being pulled through a finger-like membrane and swallowed by a moving spherical object – a cell- where he joins even more atoms.



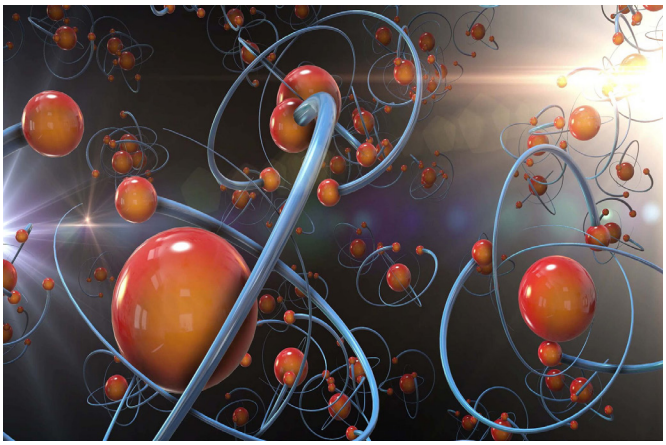
The Carbon Cycle

Let's explore how the journey which is called the Carbon Cycle is arranged to regulate Earth's temperature, provide sustenance for living beings, build ocearnic infrastructure and remove waste.

Once again, he is wisely guided to join another group of atoms to make a polypeptide molecule. This newly formed polypeptide molecule is given special instructions: it is to join millions of other molecules for a very important role. Their mission? To build a new muscle fiber in the body of the little rabbit.

After coming together to form the muscle fiber, Carbo and the other molecules get to work. The proteins built by Carbo and his buddies slide past one another every time the little rabbit moves. After a while though, the bonds between the molecules become weaker. The protein filaments begin to lose their strength and are metabolised by the body of the little rabbit. Carbo, along with two oxygen atoms, are combined into CO2 and released through the lungs of the little rabbit into the air. Once again, Carbo finds himself floating upwards towards the sky.

Carbo is not alone. Billions of its siblings are having the same journey every day. Let's explore how the journey which is called the Carbon Cycle is arranged to regulate Earth's temperature, provide sustenance for living beings, build oceanic infrastructure and remove waste.



First Dimension : Analytical Thinking

SCIENTIFIC UNDERSTANDING OF CARBON CYCLE

Carbon is the sixth most abundant element found on Earth. It is found in both the living and non-living constituents of our planet. In our bodies, carbon is one of the most abundant elements, second only to oxygen.

Carbon comes from the Latin word carbo which means charcoal. Charcoal is a source of carbon.

Carbon has many allotropes. Allotropes are two or more existing forms of an element. In theory, allotropes are made of the same type of atom (carbon for example) but the atoms are arranged differently and, remarkably, have different properties.

Carbon has eight allotropes. We will explore the properties of three of these allotropes below:

Amorphous Carbon: This type of carbon comes in the form of coal and soot. Soot is a black or brown powder formed by the incomplete combustion (burning) of wood and other hydrocarbons. Coal, a fossil fuel, is used in electricity generation, steel production and in the manufacturing of cement.

Graphite: This form of carbon is black and soft. It is used to make pencils as it is soft enough to write with. It is also used for thermal insulation and is a good conductor of electricity.

Diamond: This form of carbon is transparent and very hard. In fact, diamond is the hardest element known to man. It is used to make jewellery due to its beautiful light-dispersing properties. Industrially, due to its hardness and durability, diamond is often placed in the tips of cutting blades and drills.

Carbon is designed in a way that makes it easy to bond with other non-metallic elements; it has four bonding sites. It forms long chains of complex molecules with other elements. Its versatility and properties to form multiple bonds allows carbon to act as the backbone of the organic molecules that make up the cells of plants and animals.

Scientists once believed that carbon-containing compounds could only be found in living organisms. All compounds containing carbon were thus called organic compounds. Today, we know that carbon is an essential component of both living and non-living matter.

What is the Carbon Cycle?

https://youtu.be/0-DtXqr-gPQ?t=1

Recall: a compound is made of two or more elements that combined using chemical bonds

An example of a compound that contains carbon is **methane** (CH3). Methane contains one carbon atom and three hydrogen atoms. Organic compounds that only contain carbon and hydrogen are called **hydrocarbons**. Methane gas is produced when animals die and rot away. It is also a component of natural gas, a fossil fuel used for heating and cooking.

Recall: Fossil fuels are sources of energy formed over millions of years from the remains of dead plants and animals

Scientists discovered that they could make organic compounds in the laboratory. Examples of industrially manufactured organic compounds are vitamins, gasoline and aspirin.

Petroleum is another substance made from multiple hydrocarbons. It is used to make many products that we use on a daily basis such as medication, make-up, paints, plastics and even clothes.

There are not a lot of substances that could be a part of the atmosphere one day, a blade of grass the following day, a rabbit the next day and a part of a lake or river the following afternoon. Carbon is an essential building block of both plants and animals. It is also a component of non-living matter such rock sediments and gases in the air. Carbon is recycled continuously from one form to another. The continuous cycling of Carbon between living and non-living matter is known as the **Carbon Cycle.**

1. Plants receive carbon dioxide from the atmosphere and use it to make carbon-containing glucose in photosynthesis.

2. Plants are eaten by animals. The carbon content of plants is then transferred to animals.

3. When plants and animals respire, carbon dioxide is released into the air.

4. When plants and animals die, their bodies are broken down by decomposers and their carbon content is released into the soil.

5. Decomposers also release carbon dioxide into the air by respiring.

6. The burning of the fossilised remains of dead plants and animals (fossil fuels) also releases carbon dioxide into the air.

So, the main process that releases carbon dioxide back into the atmosphere is **respiration**.

The main process that transfers carbon from the atmosphere to the bodies of living things is **photosynthesis**.

Amazing Scientific Facts
-The Carbon Cycle-

1. Did you know that 90% of the mass of trees consist of carbon? Indeed, it is an amazing scientific fact that trees not only clean the atmosphere for us, they also make green leaves and delicious fruits from a poisonous gas. What a great way of recycling our waste!

2. Did you know that the ten most expensive diamonds are priced anywhere from a few million to hundreds of millions of dollars? Indeed, some believe that the most famous diamond- Koh-i-Nour- is worth more than one billion dollars and it is owned by the Queen of England. It was brought to England from India taken over from the Mogul Emperor, Nader Shah.

3. Did you know that carbon is the "friendliest" element? It can bond with almost any element and can form about 10 million compounds. Indeed, the very term "organic compound" refers exclusively to chemicals containing carbon.

4. Did you know that nearly one-fifth of your body is carbon? Indeed, carbon is the most important element of life. Although there are many other important elements for life, carbon is the element whose unique properties tie it all together.

5. Did you know that the burning of fossil fuels releases five and a half tons of carbon annually? Of this quantity, over three billion tons of carbon remains in our atmosphere.

6. Did you know that without carbon and other greenhouse gases that are designed to trap heat in our atmosphere, our planet would rapidly freeze? However, the amounts of each of these greenhouse gases have to be kept in a delicate balance. Indeed, global warming is due to a rise in carbon dioxide levels that occurred because of the burning of fossil fuels which began in the Industrial Revolution.

7. Did you know that according to information scientists obtained from the ice cores of glaciers, the atmosphere has not had this much carbon for at least 420,000 years? Indeed, the rate at which temperatures on our planet are rising is alarming. Scientists warn us that if we do not reduce fossil fuel consumption substantially, we will have a real disaster by 2050.

8. Did you know that the softest known material (graphite) and the hardest known material (diamond) are both made out of carbon? Carbon atoms generally come together to form sheets, like a honeycomb with a carbon atom in each corner. If you stack the sheets, you will have graphite. If you roll the sheets into tubes, you will have the strongest material known to science: carbon nanotubes. The formation of diamonds requires very high temperatures and pressure to pack carbon atoms into beautiful forms.

100% free 5D thinking materials are available at www.5dthinking.org

Second Dimension : Analogical Thinking

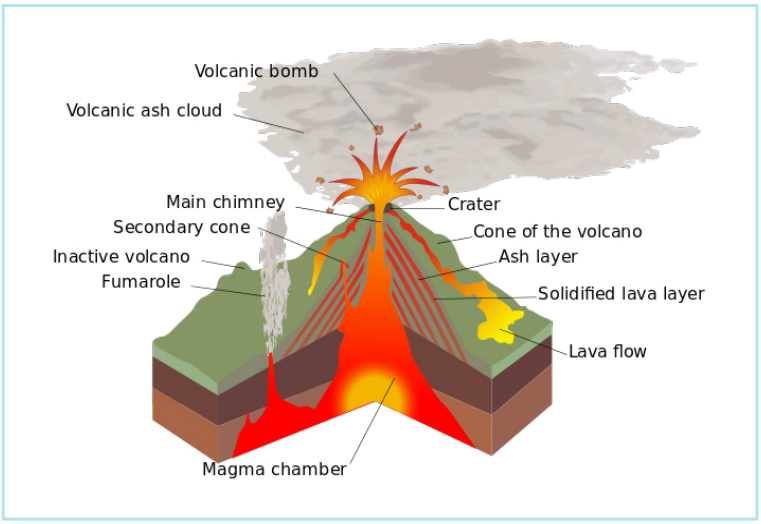
CARBON CYCLE VS. COOLING AND CLEANING TECHNOLOGY

As mentioned in the previous dimension, carbon is an essential component of living (biotic) and non-living (abiotic) matter. Let us now compare the Carbon Cycle to a broken thermostat.

Let's say the furnace in your home is putting out too much heat and carbon dioxide. What would you do to cool your house down and clean the air?

Well, first, you would open the windows.

On Earth, an increase in volcanic activity results in the production of more heat on the planet. When temperatures rise, there is an increase in weathering; rocks are worn away to release carbon dioxide and calcium into the soil. Eventually, the released carbon dioxide and calcium end up in the oceans where they form limestone. The process by which limestone is made results in the uptake of carbon dioxide from the oceans, keeping global carbon dioxide levels -and the temperature of the planet- in check.



The furnace of a broken thermostat works in a similar way to the volcanic activity on the planet that produces excess heat.

The weathering of the rocks within the soil to release carbon dioxide and calcium is analogous to 'opening the windows'.

What is the difference between opening the windows to release excess heat and the weathering of the rocks? One is a conscious action and the other is a process we are completely unconscious of and do not have the least bit of control over. Opening the windows to release indoor heat is a conscious decision made by an advanced thinking process. Do you think a cat- or a parrot- would consider opening the windows when the room gets very hot?

We certainly understand that it takes a very high level of conscious effort by thousands of people throughout history to come up with a modern cooling system such as air-conditioning.

Of course, the act of 'opening the windows' on Earth to release the excess heat and clean the airis much more elegant and complicated. We are not in control of the process through which weathering of rocks occurs to reduce the Earth's temperature. Who commands the rocks to release their carbon dioxide and calcium into the soil? Who makes sure that all the excess carbon dioxide and calcium are used to create limestone?

Obviously, it does not make sense to ascribe those wise and beneficial acts of carbons to them since they do not have any conscious. Thus, they do not know what they do though they seem acting as if they know living beings and care about their life. Indeed, it is a great insult to scientists if we think that they could not compete with unconscious, unintelligent, ignorant, and dead atoms.

The Carbon Cycle - Nathaniel Manning

https://youtu.be/A4cPmHGegKI

Negative Emissions Technologies

To appreciate how the air is cleared from poisonous gasses, let us examine the negative emission technology used to counteract the levels of carbon dioxide in the atmosphere more closely. Scientists at RMIT University in Australia developed a method to convert carbon dioxide back into solid carbon at room temperature. The goal was to 'rewind' the emissions clock. But, is this really possible?

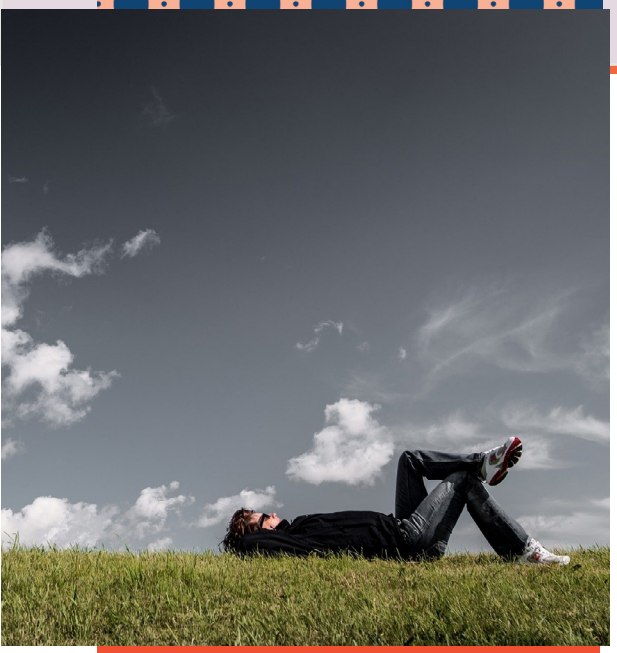
Previously developed technologies utilised large amounts of energy and were thus not feasible. For example, one former method of carbon capture based on injecting liquid carbon compounds underground caused environmental hazards due to multiple leaks. Another method that converted carbon dioxide gas back into usable fuel was found to be ineffective. The net loss of carbon from the atmosphere in this process was zero; the fuel produced using this method was burned once again.

The new method is based on the premise that a liquid metal catalyst is used in the process of converting gaseous carbon to solid carbon at room temperature. The solid carbon can then be used industrially in the manufacture of objects such as airplane wings, battery electrodes and even golf clubs and tennis rackets. However, the RMIT University method, classified as a 'Negatives Emissions Technology' has major limitations.

In 2017 alone, human beings produced 32 billion tons of carbon dioxide into the atmosphere. For this amount of carbon dioxide to be removed from our atmosphere, scientists would have to make the enormous mountains of rock that miners dug through to extract the carbon-containing coal in the first place. Although it seems like a noble venture, this mission would be very difficult to implement on a global scale. On the other hand, oxygen and carbon cycles work seamlessly to clean the air and build tons of food for living beings out of poisonous gas.

In short, thousands of scientists have built upon the work of each other to come up with the right technology to address the challenges of climate change today. Still, even the most sophisticated technological advances have their limitations. In reality, the capabilities of human beings are limited in scope and magnitude. Despite the big progress we have made, our technology is no match to the Carbon Cycle in terms of its elegance, efficiency, and beneficial outcomes.

Third Dimension :
Critical Thinking



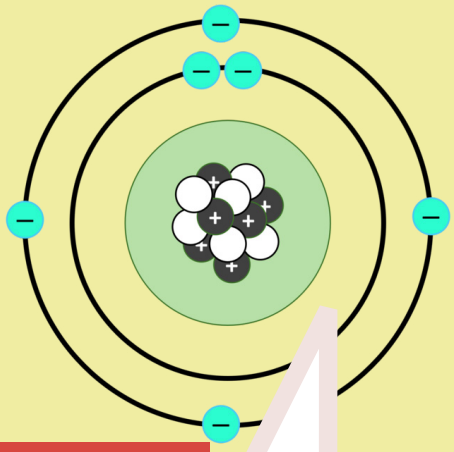
EXPLORING THE MAKER OF THE CARBON CYCLE

In the previous sections, we looked at how carbon is used to make many useful substances including delicious food. We explored how its ability to bond with other non-metallic elements- is a useful property- one that is utilized by manufacturers to make many of the tools and gadgets we use in our daily lives. We compared the Carbon Cycle to a broken thermostat. We also looked at how recent technology has tried to address the problem of rising carbon dioxide levels on our planet.

Let us reflect on how those carbon cycle technologies came to be. What do you think is necessary to develop such technologies? Do you think animals with limited cognitive abilities and knowledge could create such technologies? How about people with no education or collaborative skills? The answer is quite clear. As you read this, thousands of scientists around the world are working to get better at imitating the Earth's Carbon Cycle. For a feasible technology to be developed, carbon gases from the atmosphere need to be captured and reused to make other materials (using

Reflection Questions on the Carbon cycle:

- **Should we not think on the very origin of the elegant carbon system?**
- **How did we get such an efficient temperature control mechanism?**
- **Can we attribute the process by which temperature is regulated on our planet to the humble carbon atom?**



CARBON ATOM

Let us take a closer look at the structure of carbon. Carbon has an atomic number of 6. This means that each carbon atom has 6 protons, 6 neutrons and 6 electrons. The electrons are so small that they do not contribute to the weight of a carbon atom- which is 12 amu. Can atoms so small and seemingly insignificant affect global temperatures? What about hundreds of such atoms, or thousands, or even millions? Are these atoms conscious of the role they are assigned to, or is there something else at play here? If consciousness is defined as the ability to sense what is beyond oneself, are atoms conscious of their environment?

It does not seem possible that trillions of miniscule carbon atoms have a state of consciousness that allows them to decide whether to be released by weathering, or whether to bind to calcium to form limestone. It seems absurd that volcanoes know when and by how much to erupt to release the heat trapped in the center of the Earth.

the least amount of energy). Scientists are working hard to get there. They say we need to wait for 5 to 10 years to see such technology being used on a wide scale. Obviously, if they succeed, we will praise their success and purchase their inventions.

Can we control the levels of global greenhouse gas emissions and levels of carbon dioxide in the atmosphere? Even if advanced technology was able to monitor changes in global carbon dioxide levels, the ability to exert absolute control on any of these changes is almost impossible. Sure, it is our responsibility to make changes to slow down the rate at which we heat the Earth, but the administrative task of eliminating climate change is a battle that will test all of our limitations

In short, we know -with certainty- that Carbon Cycle technologies are possible through the strong will of thousands of intelligent and well-educated scientists. We also know that it does not matter how well they become- their product will not be as good as the Earth's Carbon Cycle in terms of efficiency and beneficial outcomes.

While trying to imitate the Carbon Cycle, should not we think on the very origin of this elegant system? How did we get such an efficient temperature control mechanism? Can we attribute the process by which temperature is regulated on our planet to the humble carbon atom? To answer this question, we must understand what a carbon atom is made of. `

Turning carbon dioxide back into coal

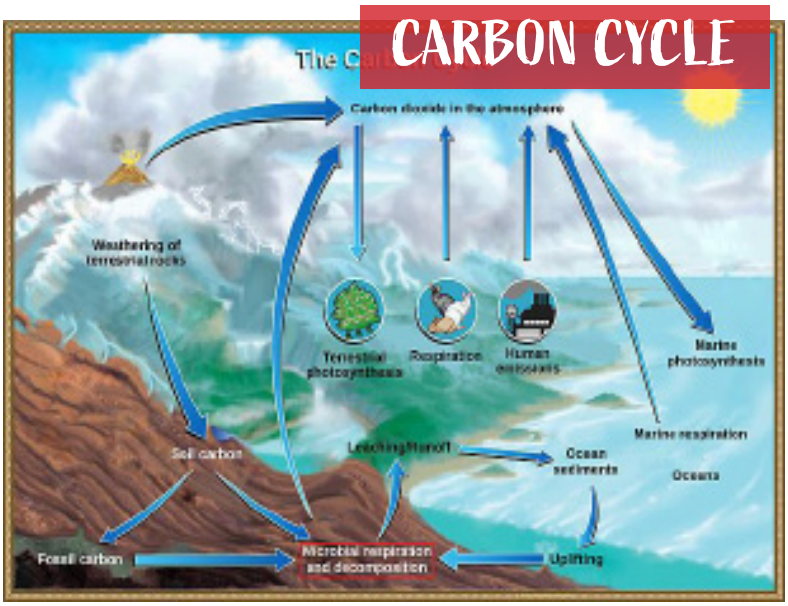
https://youtu.be/03gWgCN61F0

It is also highly unlikely that plants are aware of just how much to photosynthesize to support their dependents on the food chain. They are not conscious of how much carbon dioxide to take in or how to combine it with water using solar energy to form glucose. After all, plants are nothing but combinations of atoms such as carbon.

Furthermore, it seems like carbon atoms do nothing beyond moving around to make different bonds. Indeed, even when our body consume carbon rich food, we are not really getting our energy from those atoms. Rather, when our body dissolve the carbon bonds, amazingly, we receive energy to sustain our life. Thus, we are not actually consuming food (carbons), we are pushing them around. Amazingly, when put stone together, we do not expect to have anything different than stony nature. However, when carbon atoms are put together in different forms, they take completely different forms such as plants, muscles, coals, and diamonds. In short, what carbon atoms do is either magical or miracle.

Obviously, neither carbon atoms nor their cousins are capable of creating such an elegant cycle. Indeed, if we were to boldly claim that these atoms were capable of creating such a system on their own, but that it was beyond the capabilities of the world's best scientists, it would be a great insult to the intelligence of those scientists. It would be like saying that what the scientists were trying to create could be achieved by the most primitive of animals or even the mindless wind.

In short, we know with certainty that man-made Carbon Cycle technologies are the products of scientists with life, consciousness, will, knowledge and power. Given the fact that the Earth's Carbon Cycle is thousand times more elegant, it requires an even greater degree of consciousness, will, knowledge and power. Since we could not breathe without such a system, it makes perfect sense to wonder about the kind Maker of this vital system.



Fourth Dimension : Meditative Thinking

CONNECTING TO AND COMMUNICATING WITH THE MAKER OF THE CARBON CYCLE

How can we know the Maker of the Carbon Cycle? How can we be sure about our knowledge of the Maker? We think the answer lies in the very nature of the Carbon Cycle. As long as we remove the veil of ignorance and explore with the eyes of wonder, we should be able to see clear signs of the Maker among His works.

As we discussed previously, it is easy to negate causes and nature as the source of the Carbon Cycle since they do not have the necessary consciousness, knowledge and power. Indeed, as we study the Carbon Cycle, we will realize that it takes infinite knowledge and power to come up with such a system. Actually, that is why we fail when we try to imitate this cycle with our limited knowledge and power.

Indeed, many scientists have recently begun to view the entire universe like a living body exhibiting incredible interconnectivity. Therefore, it is wrong to study any part in isolation. It does not make sense to think that the lungs work without the brain, the heart and stomach. Similarly, it is not possible for the Carbon Cycle to even exist without elegant, interconnected microscopic and macroscopic systems.

First, at the micro level, it is clear that to truly claim ownership over the Carbon Cycle, one needs to first have the knowledge and power to create and sustain a carbon atom with its electrons, protons, and neutrons and many other subatomic particles. Indeed, despite our great success, we do not even know with certainty how electrons move from one place

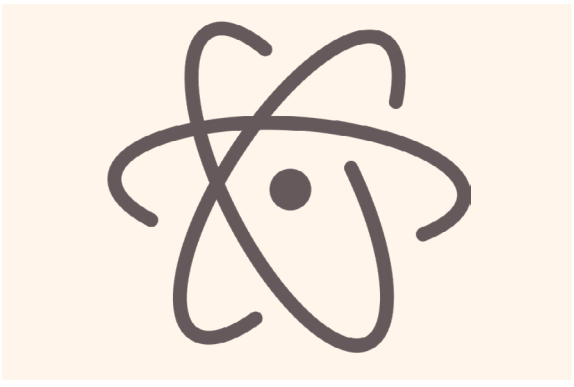
to another. We cannot claim to have the ability to create or control the miniature universe at the subatomic level in any shape or form. Second, as we discussed before, for anyone to create carbon and the Carbon Cycle, it is necessary to know the structure of all the other atoms and know how to make carbon work with them through the creation of new bonds.

Third, it is necessary to know how to build the structure of living organisms in order to come up with a way to eliminate poisonous gases from the air and turn them into pleasant food. Fourth, it seems like carbon atoms work like magical workers. As they establish different bonds with each other and other elements, amazing products emerge out of those bonds. We know from our experience that it is not possible to get any product purely through forming a circle with other people. We can get something if we work together applying our knowledge and power to form something output from certain inputs.

At the macro level, tasks of carbon atoms are getting even more difficult if not impossible. They need to receive essential help from the sun, the moon, the planets, stars and galaxies to fulfill their functions. Indeed, there would be no Carbon Cycle without the infinitely interconnected macro and micro level systems of the universe. The sun, force of gravity, atmosphere, plants, decomposing bacteria and many other organisms collaborate like a team with millions of other members to partake in the Carbon Cycle process. Thus, it is clear that the One who creates the Carbon Cycle must be the One who creates and sustains the entire universe. Indeed, scientists believe that most of the carbon on Earth came from a collision between our planet and an embryonic planet resembling Mercury 4.4 billion years ago. That is clear evidence of the universal interconnectivity necessary for the Carbon Cycle. Indeed, the entire universe works like a single living body. Everything is linked to everything else. Everything relies on everything else.

Let us try to reflect further on how the Carbon Cycle is linked to our survival.
What would happen if different stages of our Carbon Cycle suddenly stopped functioning? What if there were a fault in:

"It seems that Carbon atoms work like magical workers"



Let us try to reflect further on how the Carbon Cycle is linked to our survival:

01

Photosynthesis

1. *Remember, photosynthesis is the process by which plants and other photosynthesising organisms known as autotrophs appear to convert carbon dioxide gas and water into glucose and oxygen using solar energy. If plants were unable to photosynthesize, they would die, which would almost instantly eradicate all other forms of life that depend on them for sustenance. Carbon levels in the atmosphere would rise very quickly, leading to increased global warming, flooding and mass destruction. Deforestation is one of the ways human beings are contributing to global warming; fewer trees means less uptake of CO2.*

02

Weathering

2. *As we learned in the first dimension, the weathering process occurs as a result of volcanic activity. The release of more heat into the atmosphere results in more rock being worn away, greater release of carbon dioxide and calcium into the oceans, and greater production of limestone. This production of limestone results in lower oceanic and atmospheric carbon dioxide levels. If the weathering process was not initiated by the excess heat produced by volcanic eruptions, the heat produced by the volcanoes would raise the temperatures of the oceans, killing oceanic plants and animals and disrupting the global ecosystem as a whole.*

03

Decomposition

3. *When animals die, decomposers feed on their bodies releasing methane gas into the atmosphere. If decomposition does not occur, Earth would be covered with millions of acres of dead plants and animal carcasses. There would be less methane in the atmosphere which would mean less carbon dioxide. This is because after methane is released from the bodies of plants and animals, it combines with oxygen in the atmosphere to produce carbon dioxide. Lower levels of carbon dioxide would lead to less photosynthesis, fewer plants and less nutrition for plant-dependent organisms. The global implications of this scenario would be disastrous.*

How volcanoes change the climate?

https://youtu.be/912OTTeZtLM

Recall: nothing is capable of being a true cause of its associated effect. In reality, there is no true causation. There is just association. Think about feeding your body. You believe you feed yourself. In reality, you only a make choice about what gets to your stomach. You do not even control how food gets digested to feed your body. Of course, you have no control over the process after you swallow. Actually, even scientists do not truly know how we gain energy from food by simply breaking down the bonds between atoms. In other words, energy does not come from consumption (such as burning) of the food, but rather through separation of the bonds between atoms of food.

Thus, if we are ignorant of the process of feeding our body in a true sense, how can we expect the carbon atom to claim ownership of the Carbon Cycle? Indeed, neither we nor other beings have any power to do anything on their own. Everything is directly caused by the Cause of All Causes. Thus, although specific causal mechanisms are required for the Carbon Cycle to occur, if we study each of those causes individually, we will find out that none of them has any ability to be the true cause. Thus, the One who creates causes directly, works through them to create effects.

It is evident that the Maker of carbon is the Maker of the Earth and all that lives in it. This is because our Creator knows the need of the inhabitants of this Earth for carbon. The Creator of carbon must also be the Creator of the universe from which it originated. In all these events taking place in connection with carbon and in fact with all elements there are infinite number of causes and cosmic relations involved. All of these cannot be brought together to produce these events unless there is One who can see them all and plan all of them to come together in such a way that those causes will listen to His command to produce those required results.

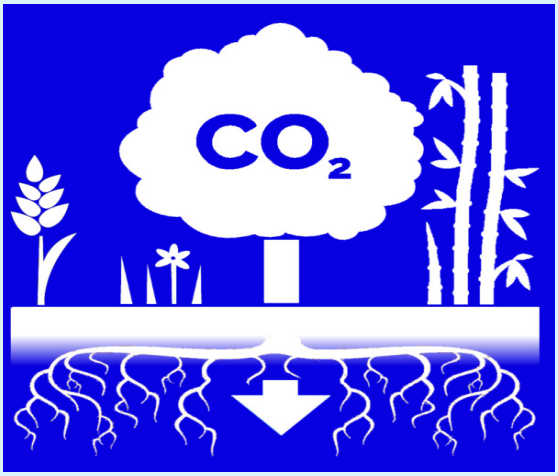
The All-Wise created carbon as an essential component of all animate and inanimate systems here on Earth. Our Maker created carbon as the backbone of our cells to which all other elements bind. Oxygen is one of the elements to which carbon is drawn to like a moth to a flame. The All-Wise created carbon and oxygen to perform their mutually compatible roles as temperature and acidity-regulators and blood purifiers.

The systems in which carbon and oxygen move from one form to another are intri-

cately bound. One cannot be separated from the other. Similarly, the movement of carbon from one form to another in the inanimate part of our planet is linked to the movement of carbon compounds within our bodies. Just like the Carbon Cycle is designed to maintain the temperature of the planet, the release of carbon dioxide by the lungs keeps the balance of our blood pH in check.

The Carbon Cycle was created to regulate global carbon levels on Earth. It was designed to maintain global temperatures and to aid in the provision of sustenance for living beings. It was also created to act as a global waste removal system. It is no coincidence that this cycle was designed to provide just the right environment for living beings to survive and thrive in.

By reflecting on the interconnectivity of the Carbon Cycle with its countless beneficial outcomes, we should ultimately reach



the conclusion that there must be an All-Encompassing Force that controls the balance between the release of carbon in the atmosphere and into the oceans, and controls its uptake into the bodies of plants, animals and rock structures. The Creator of the Carbon Cycle must know of the most minute temperature fluctuations that occur on our planet. He must know the amount of carbon that needs to be stored or released to maintain stable Earth temperatures.

In short, the Creator of the Carbon Cycle must have the wisdom, ability and power to maintain the accurate balance of carbon compounds within our atmosphere, oceans, rock structures and living beings. Through His constant creative acts of the Carbon Cycle, He makes Himself known through His many names.

For instance, the smooth and efficient process of the Carbon Cycle shows Him as All-Powerful and All-Knowing. Using the same carbon atoms again and again without wasting a single one of them speaks about Him as All-Wise. Converting poisonous gases into pleasant food points to Him as The Most-Kind and The Most-Merciful. Providing food to all living beings through this cycle without any discrimination shows that He is All-Compassionate and Most Caring.

Fifth Dimension : Moral Thinking

RESPONDING WITH BETTER CHARACTER

Let us imagine that the Carbon Cycle was permanently disrupted. Could we fix it? Would we be able to find a substitute for its multifaceted roles? The answer seems simple. We did not create the Carbon Cycle, nor did we purchase it. Even if we were to bring the world's finest climate experts together, we would simply not be able to re-design this system. Likewise, the apparent causes of the cycle are not capable of creating their associated effects. The Infinite Power constantly works within those causal mechanisms to clean poisonous gases from the atmosphere and convert them to food for living beings.

The Carbon Cycle has been designed to allow for our survival here on Earth. The continuous cycling of carbon from one form to another is beyond the scope of our imagination. **Appreciation** is understanding the value of our flawless Carbon Cycle.

The True Bestower of Bounties wants in return for the precious gift of the Carbon Cycle three things: one is remembrance, another is reflection, and the third is gratitude.

Indeed, we can learn many valuable lessons by observing carbon atoms in action. For instance, we can learn about friendship and collaboration by observing how carbon atoms bond with other atoms. The property of a carbon atom that allows it to form multiple bonds to form complex molecules demonstrates how collaboration results in the accomplishment of shared goals and beneficial outcomes. By reflecting on the process by which carbon atoms combine under extremes of temperature and pressure to form a diamond, we learn that we can only realise our full potential by persevering in the face of challenges.

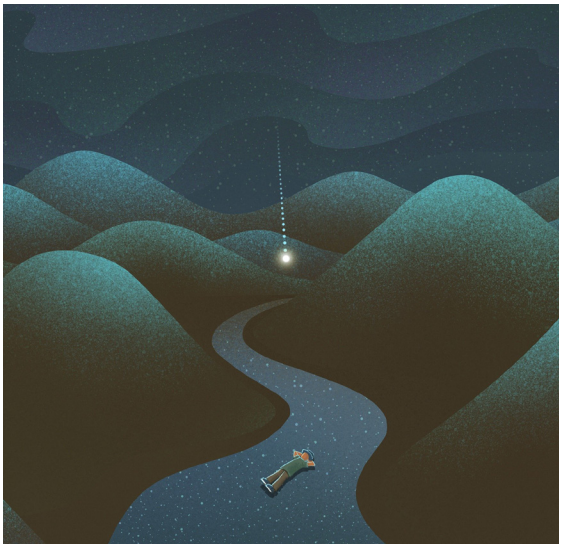
Perhaps, the reason our Creator has chosen to employ carbon atoms in the building of a diamond and in the structure of our bodies is to show that we can become as precious as a diamond if we choose to conquer our soul (nafs) by struggling against the pressure of its evil commands. Though both coals and diamonds are made of same atoms, one is used as fuel for fire while the other is kept for its high value.

> ***"Both Coal and Diamond are made of the same atoms, one is used as fuel while the other as an expensive gem."***

1. **Remembrance** *is realizing that there is a Creator of the Carbon Cycle. It is not taking anything for granted. It is remembering Him as the true Owner. It is reciting His names while reflecting on His creative actions in the Carbon Cycle.*

2. **Reflection** *is thinking about the apparent causal mechanisms in order to appreciate the knowledge, wisdom and power behind the Carbon Cycle. It is to understand the interconnectivity of the Carbon Cycle with everything else at the micro and macro levels and to realize that apparent causes are just the veil of the Cause of all causes. It is to ponder on the countless beneficial outcomes of the Carbon Cycle to know about the Creator of the cycle through His compassionate actions.*

3. **Gratitude** *is being aware of the priceless, miraculous Carbon Cycle as a gift of our Creator's mercy. It is to be thankful to Him for bestowing upon us a Carbon Cycle designed to regulate the temperature of our planet, provide nutrition, remove waste and build the inner infrastructure of our oceans. It is being thoughtful of the guiding lessons embedded in the Carbon Cycle.*



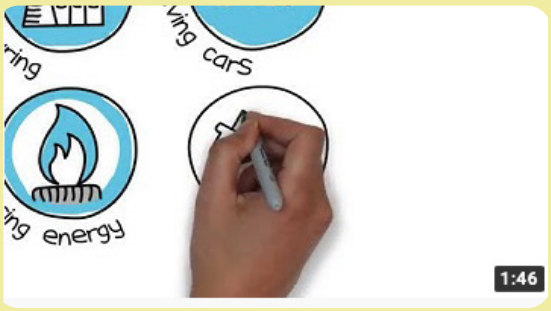
How can we express our gratitude and appreciation for the Carbon Cycle in our daily life?

Let us consider what steps we can take to remember, be grateful and reflect:

Remember the value of carbon. When biting into a piece of fresh fruit, consider the meticulous process through which it came into existence. When it comes to choosing whether to walk, cycle or drive to school, think about the impact of your choices on the levels of carbon dioxide in the atmosphere. Try to choose the environmentally friendly option, particularly if your destination is a short distance away.

Reflect on the value of having access to technology that makes indoor temperatures more comfortable. Using a thermostat in winter and an air conditioner in summer are luxuries that most people on the planet cannot afford. Be **grateful** for the luxury of a comfortable indoor environment.

Reduce your Carbon Footprint



https://youtu.be/Xdl5Vht0sO8

Be aware of your **carbon footprint.** Your carbon footprint is the impact you make on levels of greenhouse gas emissions (such as carbon dioxide) by the actions that you take on a daily basis. You can estimate your carbon footprint by considering the transportation that you take to and from work or school, the electrical appliances that you use, the size of your house, how much you recycle and even by how much, and what you choose to, eat.

Being **good citizens** of this planet means having **respect** and **appreciation** for the resources provided to us by our Creator. Be mindful of Creator of carbons who creates plants and fruit largely from a poisonous gas.

To be good citizens, we need to strengthen our **self-regulation**. Developing **self-regulation** means that we become conscious of the choices that we make and become aware of the impact our carbon footprint makes on the environment. A self-regulated person is conscious of his or her actions and reactions.

There are several ways to reduce your carbon imprint.

1. Walk, cycle, carpool or use public transportation to school or work. Fewer cars on the roads means less burning of fossil fuels.

2. Eat less beef. Gas emissions from the production of beef are enormous. To be produced, one pound of beef requires 50,000 gallons of water.

3. Leave your devices unplugged when you are not using them. This form of energy wastage is called “vampire power”.

4. Plant a garden. Trees absorb carbon dioxide.

5. When shopping for groceries, buy local. When you buy imported fruit or vegetables, consider the distance travelled by these products to get to your shelves. Less distance translates to less fuel usage.

6. Air dry your laundry, rather than using an electric dryer.

TEST YOUR KNOWLEDGE

I.UNDERSTANDING SCIENCE TERMS

Complete the following sentences with a word or words from the Science Terms that will make the sentence correct.

Diamond *Graphite* *Hydrocarbon* *Photosynthesis* *Respiration* *Carbon Cycle*

1. Organic compounds that only contain carbon and hydrogen are called _____(s).

2. The process in which carbon is transferred to the bodies of living things is called _____.

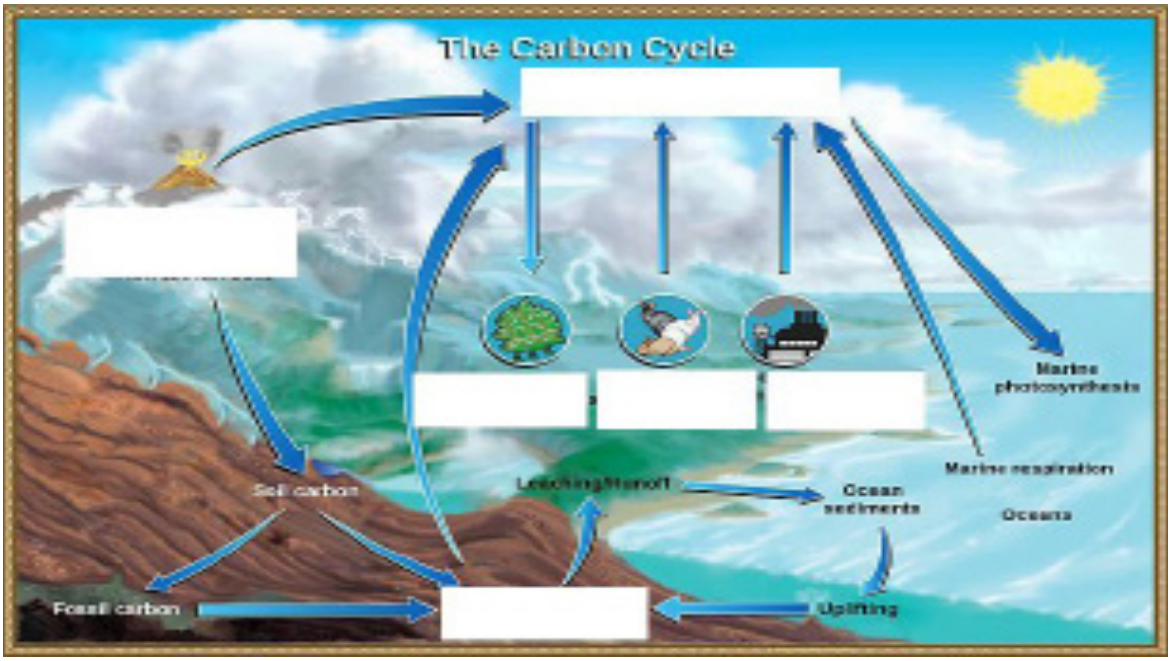
3. _____ is a form of carbon that is used in pencils.

4. The hardest substance known to man is _____.

5. The continuous transfer of carbon between living and non-living matter is known as _____.

6. The process that releases carbon dioxide back into the atmosphere is known as _____.

Label the following diagram:



II.CHECKING FACTS

Determine whether each of the following is true or false.

1. When plants and animals respire, oxygen is released into the air._____

2. Decomposers release carbon dioxide into the air by respiration _____

3. One fifth of your body is made of carbon. _____

4. Without the presence of greenhouse gases, our planet would freeze. _____

5. Living organisms as also known as abiotic matter. _____

III.UNDERSTANDING CONCEPTS

Write a short answer for each question or statement.

1. Where is carbon found on the planet?

_____

_____

2. Name the four stages of the Carbon Cycle.

_____

_____

3. What is carbon made of?

_____

_____

4. How do you know that there is a Hidden Hand behind the control and maintenance of the Carbon Cycle?

_____

_____

_____

5. List two hidden messages in the Earth's Carbon Cycle from its Maker.

_____
_____
_____

6. Why is it an offence to deny the presence of the Maker of the Carbon Cycle?

_____
_____
_____

IV.APPLYING CONCEPTS

Write a paragraph to answer each question.

1. How is the design of the Earth's Carbon Cycle different from Negative Emissions Technology?

_____
_____
_____
_____

2. Describe how your life would be impacted if you were forced to grow the food you eat.

_____
_____
_____
_____

3. Why do you think material elements such carbon and oxygen atoms could not have created the Earth's Carbon Cycle?

_____
_____
_____
_____

4. The One who creates the Earth's Carbon Cycle has to be the Creator of the Earth. Why?

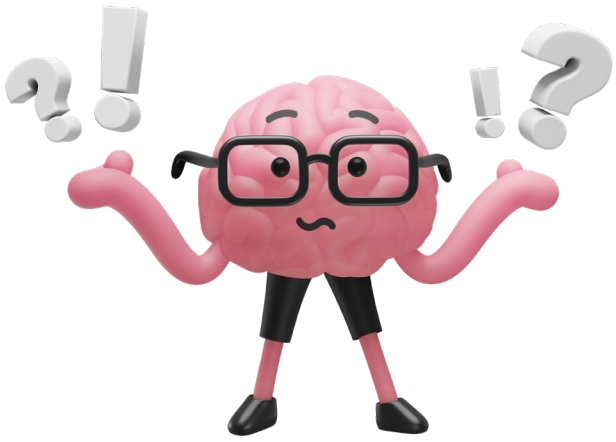
_____
_____
_____
_____
_____

5. Why do you think the Carbon Cycle is an extremely valuable gift? Describe two things that make you appreciate the value of this gift.

_____
_____
_____
_____
_____

6. How can you show your gratitude to the One who granted you the gift of the Carbon Cycle?

_____
_____
_____
_____
_____



V. THINK-THANK GAME

In this “think-thank” game, we want you to think about the carbon cycle and give thanks to its Creator. We also call it the “play to praise” game. The goal of this game is to think of at least five things about the carbon cycle that you are thankful for.

Number of players:

At least two.

Directions:

Player 1 repeats an appreciation phrase loudly and quickly. Player 2 responds, without pausing, with something to be thankful for. This is repeated five times.

To win:

Player 2 needs to respond five times (without pausing) with different things about carbon cycle to be thankful for in order to win the game.

Here is an example of two rounds of this game:

1.Player 1 repeats the appreciation phrase loudly and quickly. For example: “Thanks to the Creator of carbon cycle!”

2.Player 2 responds, without pausing, with something about carbon cycle to be thankful for. For example: “creating an efficient system to cycle carbon without wasting a single carbon”

3. Player 1 repeats the appreciation phrase again loudly and quickly. For example: “ Thanks to the Creator of carbon cycle!”

4.Player 2 responds, without pausing, with another thing about the carbon cycle to be thankful for. For example: “For creating fruit through absorbing carbons from the atmosphere!”

This should be continued for another three rounds until Player 2 wins or loses.