

Episode – 20

Atmosphere

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- Vasudha : Manav, Shrishti quick, help Vivek Bhaiya to put luggage in the car
- Vivek : Mummy! shrishti is helping me but just look where Manav is? He is no where to be seen.
- Shrishti : (huffing) Bhaiya, he must be here somewhere saying bye to his friends. (pause) This bag is so heavy.
- Suryaprakash : Bring Vivek bring this bag in the back.
- shrishti : Look Bhaiya it is so easy to locate Manav. From our house to Nand u's house leaves are scattered all over the road.
- Vivek : Here he comes. (Calling) Manav hurry up we are about to leave.
- Manav : Bhaiya what's the hurry it just so early in the morning. Daddy was saying we will reach in 9 hrs time.
- Vasudha : Sure it takes only 9 hrs but we are going in the mountains and it becomes dark early there and the roads are also spiral.
- Manav : (laughs) what mummy the sun set will be at the same time whether we are here or in the mountains.
- Suryaprakash: Arrey Manav, In the mountains the sun gets behind the larger mountains in the same manner as happens to small buildings surrounded by bigger ones the sun light doesn't reach the smaller buildings and it becomes dark early in them.
- Vivek : All this is all right just tell me what you have against these plants why do you always pluck and destroy there leaves.
- Manav : Arrey bhaiya cool down the plants are not complaining so why do you worry so much.
- Vasudha : Shut up Manav, We have life because of these plants only and you are destroying them only.

Manav : Life from plants. How is it possible?

Vivek : O.k. Now sit in the car and I'll tell you along the way how these plants are responsible for the birth of naughty children like you.

Suryaprakash : Ok now every one sit down in the car, Dilawar lets begin our journey

(sound of car starting)

Shrishti : Mummy look at Manav he is putting his hand out of the window.

Vivek : Oye leaf ripper keep your hands inside.

Manav : Bhaiya its just a bit outside. Can you feel the speed of air. I just incline my hand it starts flying up and up.

Vasudha : Okay now you have seen now place you hands inside.

Suryaprakash : From where is this wind coming

Manav : The car is speeding so we can feel the air.

Vivek : Meaning if the car stops there won't be any air.

Manav : yes vivek Bhaiya.

Shrishti : If the air is not there how will you breathe?

Manav : I'm talking about the wind and not the about the air containing oxygen.

Suryaprakash : Ok so when you breathe in air containing oxygen goes inside why?

Manav : no Daddy!!

Vivek : Manav do you know that air that is around us only has 21% oxygen.

Manav : 21% oxygen!!!so what is the rest.

Suryaprakash : Now manav is sitting with his hands inside so let us answer all his queries.

Vivek : Look Manav. The atmosphere of our earth is made up of lots of gases and all these gases have there independent roles.

Manav : Atmosphere that is blanket of this earth. Is it not so Bhaiya.

Surya prakash : Yes, yes, absolutely right. The maximum amount of gas present is nitrogen. approximately 78% and 21% oxygen

Shrishti : That means 99% amount for these two gases only.

Manav : So shrishti the rest 1% must be carbon di oxide.

Vivek carbon dioxide is only the 33rd part of this 1% that is 0.03 % rest is a mixture of other gases but their proportion is so less that they are known as trace gases.

Dilawar What you all must be joking if there is so less of carbon dioxide why is there so much of uproar over increasing carbon dioxide levels.

Suryaprakash : (laughs) Dilawar you wont get rid of yo ur habit of arguing. You concentrate on the road and I'll tell you about carbon dioxide later.

Dilawar : Sir I don't know the pollution control people told me so.

Vasudha : Dilawar is right if there is so less of carbon dioxide why is there so much of uproar over increasing carbon dioxide levels.

Dilawar : Yes Madam.

Shrishti (laughs) Daddy you wanted to keep manav interested mummy and dilawar uncle have also started taking interest.

Suryaprakash : (laughs) Ok dilawar you concentrate on driving and we'll te ll you about carbondioxide, oxygen atmosphere everything.

Vivek : Manav you also pay attention.

Manav : But Bhaiya I know about the atmosphere.

Shrishti : And me too

Suryaprakash : So you two explain about the atmosphere and where you will face difficulty we'll help.

Shrisht : OK Daddy. So Dilawar Uncle our earth is covered with a blanket of air.

Manav : –The atmosphere, I had told earlier.

Shrishti : Atmosphere that is the air around the earth.

Dilawar : How thick is this layer of the air?

Surya prakash : Suppose the earth is the size of a football the air blanket will be thick as a sheet of paper.

Manav : Really a sthin as paper???

Shrishti : Arrey thin as paper if the earth is the size of football.

Vivek ; And this layer of air is responsible for life.

- Suryaprakash : This atmosphere helps the earth keep itself warm and protects the earth from ultra violet rays coming from the sun and meteors coming from the space.
- Shrishti : The meteors falling from the space get destroyed before reaching the surface of the earth due to friction caused by the atmosphere.
- Manav : And clouds giving us rain are also a part of this atmosphere only.
- Dilawar : That means the foundation of life is not only below on the surface of the earth but also above that is in the atmosphere .
- Suryaprakash : You are absolutely correct Dilawar.
- Vivek : Atmosphere can be basically divided into 5 layers.
- Manav : (Eagerly) Yes, The lowest one is troposphere, above it is stratosphere, in the middle is mesosphere, above it is thermosphere and the outermost is the exosphere.
- Dilawar : Hey Manav what are these?
- Manav : These are the layers of the atmosphere.
- Suryaprakash : Very good Manav. Now tell me what is the speciality of troposphere and how thick it is?
- Shrishti : Daddy troposphere is 10 to 16 km thick and all the seasons and climate are made here only. 80-90% air or gas is present in this layer only.
- Vasudha : Very good Shrishti.
- Suryaprakash : Do you know that when the temperature of earth is 14.5 degree Celsius the temperature of troposphere is 55 degree less than zero.
- Manav : What Daddy but the troposphere is nearer to the sun so its temperature should be more.
- Vivek : Ok Manav tell me hill stations are nearer to the sun than plains but still the temperature there is less. Is it not?
- Manav : (thinking) That's true mountains have snow though it's nearer to the sun. Why is it so?
- Shrishti : This is so because the density of air is less in mountains compared to the plains.
- Dilawar : Hey air is always light. Arey..

(sound of screeching brakes)

Suryaprakash : Arey Dilawar be care ful we could have easily hit the cyclist.

Dilawar : I was attentive but these big vehicles don't give any respect to the smaller vehicles. See both the buses are trying to overtake eachother and we have to come down from the ro ad.

Vasudha : You keep your eyes on the road all this keeps on going.

Dilawar : Don't worry madam I am just like the atmospher i'll protect you and take you to your destination.

(everyone laughs)

Suryaprakash : So atmosphere drive carefully.

Manav : So vivek Bhaiya tell me why is it that when the air is light the temperature is less?

Vivek : See Manav , heavy air means that the density of air is more that is more atoms are present. And when the wind is slow these atoms take energy from the sun. Their elect rons collide with each other and generate energy.

Shrishti : As we go up the sea level the density of air decreases.

Vasudha : Meaning that atoms become further apart and though take energy from the sun but their electrons do not collide with each other.

Shrishti : That is true mummy.

Dilawar : That is why it is difficult to breath at very high altitudes.

Vivek : Yes and due to less pressure it takes more time to cook dal in the mountains. understood.

Suryaprakash : So above the troposphere is the stratosphere. This lies about 16 to 50 km above the earth surface.

Manav : Daddy this stratosphere must be colder than troposphere?

Vivek : No Manav, here the case is different. In the stratosphere as we move up the temperature rises.

(sound of brake)

Suryaprakash : Now what happened Dilawar?

Dilawar : Sir when there are no rules in the atmosphere why should we have.
We'll stop at the dhabba for some tea.

Vasudha : See what is happening after listening to you.

Suryaprakash : OK dilawar if you say so we'll definitely drink tea but not here.
There is a nice clean dhaba ahead we'll stop there for tea. Now lets go.
(sound of car starting)

Dilawar : Sir nature makes its own rule. sometimes if we go up it is cold
sometimes it becomes hot.

Suryaprakash : (laughs) Arrey dilawar these are the wonder of nature.

Manav : But vivek bhaiya why does this happen in the stratosphere?

Vivek : Manav there is a layer of ozone in the stratosphere. You must know
what this ozone does?

Manav : Yes vivek Bhaiya this ozone protects us from the dangerous ultra-
violet rays of the sun.

Suryaprakash : Very good Manav. Actually due to this absorption of ultra -
violet rays of the sun the temperature in the stratosphere is more,
understood.

Manav : Yes Daddy this ozone is responsible for life on the earth.

Shrishti : Yes Manav, But this ozone layer was made by plants and then life
happening on the earth.

Manav : How come didi?

Vivek : Slow down Manav. You keep on going ahead first let us finish the
atmosphere then we'll talk about other things.

Shrishti : So, after the stratosphere comes the third layer of the atmosphere, the
mesosphere. The part of mesosphere which is adjacent to the
stratosphere is hot but as we go up the temperature goes as low as
minus 90 degree and below.

Dilawar : Lo ji, now one more new story.

Suryaprakash : Dilawar keep your eyes on the road and ears on what we are
saying. Be careful.

Dilawar : This is not fair sir. You are telling such interesting facts and you expect me not to take any interest.

Vasudha : (Frightened) If this interesting conversation is disturbing you we can talk about some other topic.

Dilawar : No. Madam no, please don't stop I'll keep my eyes on the road and my ear on your conversation.

Vivek : So Manav this layer has the lowest temperature and contains some dust particles and light clouds. The end of mesosphere is about 80 km above from the earth surface.

Manav : Yes and after mesosphere comes ionosphere. Is it not bhaiya?

Vivek : Yes Manav and mesosphere consists of ions in its layers;

Suryaprakash: when Radio waves hits these layers they are reflected back by these ions to earth and help the communication all over world possible

Manav : means I am able to lessen Radio because of the waves which are reflected from 80 kilometer above the earth.

Suryaprakash : Yes so above the mesosphere!!!!

Vasudha : don't go above let's have a cup of tea first.

Suryaprakash : Why not? Bhai Dilawar the restaurant is just ahead on your left side.

Shrishti : Daddy the fourth layer is the thermosphere and is not the hottest layer.

Vivek : Yes Shrishti The uppermost part of the thermosphere is about 450 km above the earth surface. This layer has some molecules which absorb the radiation from the sun and the temperature in this layer goes upto 2000 degree.

Dilawar : Really, Sir your restaurant has come and oh my!!! 2000 degree hearing that that only my mind the car has also become heated.

Suryaprakash : Yes Dilawar stop here only. The engine will cool down and you too cool down.

Shrishti : Manav, After the thermosphere starts the outermost layer the exosphere. This layer ends about 900 km above the earth surface. Here the air is very thin and molecules from this layer escape to the space.

(Sound of car stopping)

Vasudha : Come lets eat something.

Suryaprakash : Dilawar, Join us after you have parked the car. We are aordering for you too.

Dilawar : Yes, Sir.

Suryaprakash : So how is the journey until now, enjoying.

Manav : Very airy.

(Laughter)

Suryaprakash : Come sit. (Pause) Three cups of tea, 3 milk shakes and 3 plates of paneer pakode.

Manav : I'll have strawberry milkshake, Daddy.

Suryaprakash : Okay, bring 2 chocolate shakes and 1 strawberry shake please.

Shrishti : Strawberry shake !!! Manav you pluck flowers and leaves and then drink shake made of them only.

Manav : What has strawberry to do with leaves.

Vivek : Yes for you the strawberries come from the troposphere and the milk comes only from the cows and buffaloes that it leaves do you understand.

Manav : Yes, I had almost forgotten, look such a beautiful flower.

Vasudha : Don t even dare to pluck it.

Suryaprakash : Come Dilawar sit. Yes Manav These plants are the real reason of our being on this earth.

Manav : How??

Vivek : Oh! At First there was excess of carbon dioxide on the earth. At that time plants grew under the water and produce oxygen as an extra gas.

Shrishti : Yes Dilawar uncle, we are talking about life many lakh years ago when it started.

Suryaprakash : So Manav you know how important ozone layer is to us. So whatever extra oxygen is there on the surface of the earth goes up and changes to ozone and forms an ozone layer which absorb the harmful ultraviolet rays of the sun.

Vivek : But when this ozone layer was thin do you know what happened
Manav?

Manav : How will I know? I was not there.

(Laughter)

Shrishti : We were also not there but we still know.

Suryaprakash : Because the ozone layer was thin life started about 10m below
water. Why 10m below?

Manav : I don't know Daddy.

Shrishti : Arrey because water also absorb ultra violet rays thats why life stat red
under water.

(Sound of cup plates)

Suryaprakash : Have tea and the shakes. Yes please put the pakodas here take
Dilawar.

Dilawar : Thankyou sir.

Manav :(Takes a deep breath) The wind is so nice here.

Vivek : Do you know the wind how do you know it is n ice?

Manav : Mummy Vivek Bhaiya is making fun of me.

Vasudha : Vivek Don't be nasty to your younger brother.

Suryaprakash : Son the wind that blows it rises from hot surface towards the
colder region and it keeps on blowing. When the warm air rises cold
air replaces it and then this cold air then warms and rises again it is
replaced by the cold air and this cycle keeps on going.

Shrishti : Do you know what this cycle is called

Manav : (slowly) You only tell.

Shrishti : This is called convection current.

Vivek : Due to the heat from the sun there are changes in the atmosphereic
pressure. And these differences in the pressure produce winds. And as
the sun keeps on giving us heat and so the winds keep on blowing.

Vasudha : Meaning wind from high pressure moves towards regions of lower
pressure.

Suryaprakash : Yes, When this difference in pressure is more the velocity of the wind also increases.

Manaav : It wont be as fast as uncle Dilawars car.

Dilawar : Very good Manav beta.

Vivek : Arrey when the wind becomes a storm it not only uproots trees it blows away cars as well as big ships.

Dilawar : True vivek bhaiya. Wind causes the wind mill to work and produce electricity.

Manav : Bhaiya if the wind keeps on blowing like this it will blow from the earth itself.

Shrishti : Oh! our Manav is so stupid, Arrey this atmosphere is the covering of the wind itself. And why it is there or why it doesn't blow away is beyond your understanding.

Manav : Now didi you only explain it to me.

Vivek : Oh this all is due to the gravitational force of the earth do you understand. The gravitational force of earth that also prevent us from flying.

Dilawar : That means I was right there is some base in my thinking that earth also has a role to play in the origin of life.

Suryaprakash : Bhai , Basis of life is dependent on a delicate balance of many thousand forces. Life is as dependent on the energy coming from the sun as it depends on the gravitationalforce of the aerth as aslo many other sources.

Dilawar : But why is their so much of controversy involving carbon dioxide. And you were saying it is present in such small quantity why is it such a big issue.

Suryaprakash : Arrey Dilawar, the problem is not carbon dioxide but its imbalance. Now look Plants live and originated because of this carbon dioxide only. Actually carbon dioxide has a special ability to absorb heat.

Vivek : Yes, if carbon dioxide is less we have cold weather if it is more it makes the earth hot.

Suryaprakash : Have you seen a green house?

Manav : Sure it is a house made of glass or plastic where plants are kept.

Suryaprakash : Very good Manav. So this green house allows the heat coming from the sun to enter the house but does not allow it to escape from there.

Vivek : So carbon dioxide does the similar work and keeps the warm earth. This ability of carbon dioxide, sulfur dioxide, water vapour and other gases are called green house gases.

Suryaprakash : (drinking tea) Similae to the earth there is another planet whose atmosphere has dense clouds of carbon dioxide and that is why this is the hootest planet in the solar system. Do you know what is the temperature of saturn?

Dilawar : First tell me what is the temperature of earth?

Vivek : I had told earlier that the average temperature of earth is around 15 degree celcius.

Dilawar : So if the carbon dioxide on venus is ten times the temperature will be 150 degree celsius. That is too high a temperature.

Suryaprakash : If that is too much then I'll tell you the temperature at venus is 500 degree celcius. So now you understand what increase in carbon dioxide concentration can do.

Vasudha : Oh my!!! 0.03 % is enough to cause quite a lot of heat don't you think Shrishti.

Dilawar : Yes Madam, should we make a move and head towards the mountains.

Suryaprakash : Yes bhai lets start. How much I have to pay?

(Sound of car starting)

Suryaprakash : So Manav now you have understood that carbon dioxide molecules absorb heat and then release it have you not?

Shrishti : Manav, have you understood anything

Manav : Ya didi a little bit.

Dilawar : So this carbon dioxide is very necessary or else our planet may have been a cold planet.

Vivek : Arrey Dilawarji, if there was no carbon dioxide there would not have been life itself.

Suryaprakash : Yes, this carbon dioxide is boon for us. We are increasing its concentration by burning fossil fuels like petrol, diesel, coal and so instead of being a boon it is becoming a bane.

Srishti : And whatever help we can get from plants Manav keeps on destroying them.

Manav : (innocently) This time who are you referring to as Manav.

Shrishti : People who destroy forests and you too Manav.

(Laughter)

d of speeding car)

Suryaprakash : Look children the mountains have started. There is so much of greenery.

Vivek : The road is curvy.

Shrishti : Manav, so much plants for you to destroy.

Manav : (complaining) Mummy look didi is teasing me.

Suryaprakash : We'll be reaching Hari chacha's house soon.

(Change of scene)

Suryaprakash : Dilawar, bring the suitcase inside. Hari how are you?

Hari : Okay bhai sahab, and you have remembered us after such a long time.

Madhvi : Yes bhabhi, but it's good at least you remembered us. Come inside you must be tired. Nandu, Aditi. See they have already gone on the roof.

Suryaprakash : (laughs) It feels so good here one feels so fresh after coming to the mountains. Let the children play let's sit inside.

(change of scene)

Aditi : Shrishti didi look we have put a new swing here.

Manav : Vivek Bhaiya, it is colder here and sun also sets early.

Nandu : Early, it's 8 O'clock in the night Manav.

Shrishti : Look Manav so many stars.

Manav : Yes didi. But we can rarely see so many from our place didi.

Vivek : Bhai that is due to pollution.

Shrishthi : And you are always destroying the plants

(laughter)

Madhvi : (calling loudly) Come children the food is ready.

Vivek : Yes Chachi. Come.

(Sound of children walking and laughing)

(Change in scene)

(morning radio tune)

Suryaprakash : (Yawning) I have slept so soundly after such a long time. Arrey vasudha where has Manav gone so early in the morning?

Vasudha : I dont know. Vivek! Vivek! Where is Manav?

Vivek : Shhh...Shhh... Be quite come here look at Manav look what he is doing.

Vasudha : Arrey Look Come here See what our Manav is doing Our Manav along with Shrishti, Aditi and Nandu is sprinkling water on the plants .

Suryaprakash :(laughs) Bhai wah! Manav has become human again

Vivek : Yes Daay. Now our Manav Is no more a plant destroyer but a plant protector.

(Laughter)
