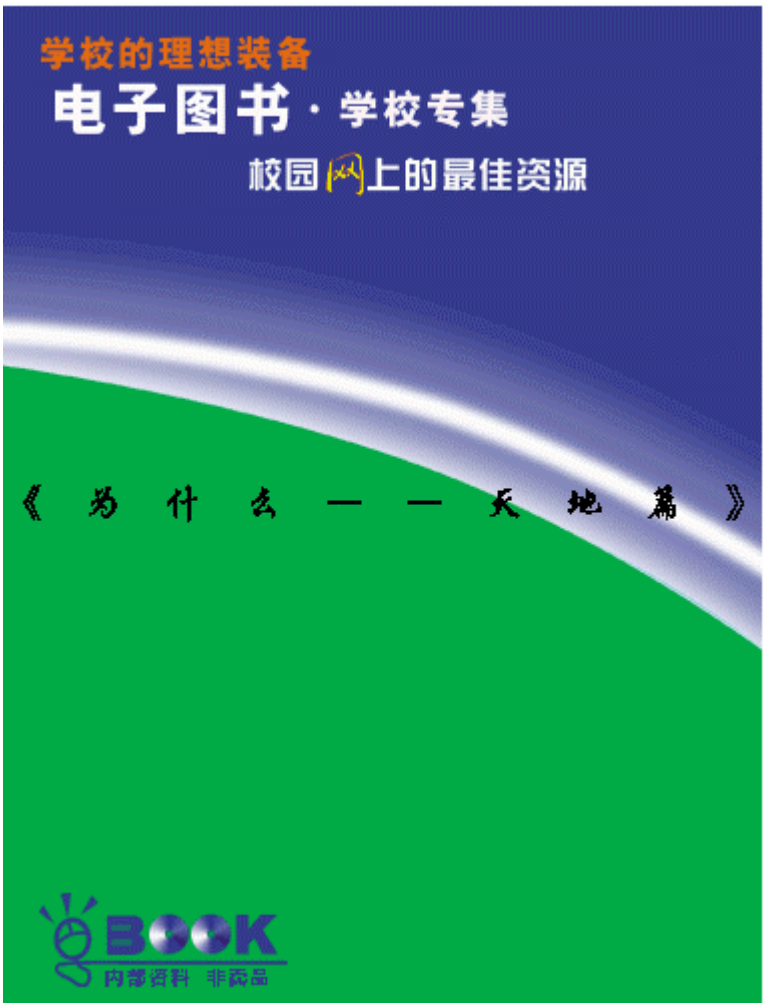
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《为什么——天地篇》
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This is a color album consisting of sixty-two basic questions about the universe, such as how big the sun is; why the moon always follows you wherever you go; why the clouds do not fall, and why there is day and night, etc. Children will have a bet-ter understanding of the universe af-ter they read this album.

First Edition 1995

Written by

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Questions about the Universe

1. How Big Is the Sun? How Far Is It from Us ?

Of all the stars that can give out light and heat, the sun is neither the biggest, nor the smallest. It appears very big because it is the closest star to us.

The sun is much bigger than the earth. Its diameter is 1.4 million kilometres. If we could put the earth into the sun, the sun could contain 1.3 million earths. If we com-pare the sun to a basketball, the earth would be only as big as a grain of rice.

The sun is 150 million kilometres from the earth. it is so far away that if we could ever walk to the sun, it would take us 3,500years to get there.

2. What Is the Colour of Sunlight?

Why does the sun look red at sun-rise and sunset? When the sun rises and sets, it goes through a very thick layer of air and a lot of sun-light is absorbed by air. That's why it looks red. Actually, the white sunlight is formed by the seven colours of red, orange, yel-low, green, blue, indigo-blue and purple. Sometimes, a rain owmight appear in the sky. The seven beautiful colours we see are divided from the white sunlight by the rain-drops in the sky. If you paint these seven colours on a disc and turn it real fast, the colours on the disc becomes white.

3. Why Does the Sunny Sky Look Blue?

In the sky there is a very thick layer of air which is colourless. So why does the sky look blue? It has something to do with the irradiation of sunlight.

Sunlight is formed by the seven colours of red, orange, yellow, green, blue, indigo-blue and purple. When the sunlight shines on the air and meets the dust and vapour in the air, the blue light in the sun-light immediately radiates to all directions, making the sky look blue. It is very easy for the yellow and red colours in the sunlight to go through the thick layer of air and then shine over the earth. Therefore, the sunlight looks yellow from the ground.

4. Is the Sun a Big Fire Ball?

Although the sun is over one million kilometres away from us, we still feel its heat. In this sense, we can say that the sun is a very big fire ball.

The temperature on the surface of the sun is 6,000'C. The temperature is much higher deep inside the sun. If we could take a small piece of stuff from the centre of the sun, dozens of cities would be burned down. This gives you an idea of how hot the sun is.

5. Can the Sun Bum Out?

The sun brings us light and warmth. But what can we do if the sun burns out?

There is no need to worry.

The sun is like a big stove using atom energy as its fuel. It bums and bums, giving out tremendous light and heat. Do you know how old the sun is? It is over five billion years old. Yet it is still a "child", not a"grandfather". The sun can live to dozens of billion years. Eventually the fire in this stove will go out, but before the sun dies out, people will have already found a way of replacing the sunlight and sun heat.

6. How Can the San Be Covered by Clouds Since It Is Much Bigger Than the Earth?

Our hands are small. But if you put one hand over your eyes, you won't be able to see the sky. When we look at things, those near us always appear bigger than those farther away.

The sun is big but it is very, very far from us. it is like a disc. As cloud is much closer to us, it appears big and that's why it can cover the sun.

7. Why Can't We See the Sun at Night?

During the day time we can see the sun, but we cannot see it after sunset. Why is that? The earth revolves all the time. During the day the earth faces the sun. As the earth turns its back to the sun, it becomes night and we cannot see it. It is the same as when you stand facing a lamplight, you can see it; but when you turn around, you are no longer able to see the light.

8 Which Is Bigger, the Sun or the Moon?

The sun appears to be as big as the moon. A dually, the sun is 100 million times bigger than the moon. So why does the sun look just as big as the moon? This is because the sun is farther away from the earth than the moon.

9. Which Is Bigger, a Star or the Moon?

Let's do a simple test first. Take a big balloon and a small apple and put them together. Which is bigger? The balloon, of course. Now, put the apple in front of your eyes and put the balloon as faraway as possible. Now look again. Why, the bal-loon has become smaller! Things far away always appear smaller than their actual size. Don't the cars and houses far away look small?

Actually, every star in the sky is much bigger than the moon. But because they are farther away from us the stars look smaller than the

moon.

10. Why Does the Moon Always Follow You Wherever You Go?

When you travel by train and look out the window, you'll feel the lamp posts and houses all run backwards. But when you look carefully, you'll find the objects closer to the train run faster than those farther away. Mountains and big trees seem to follow you.

The moon, hanging high in the sky, is very, very far from us. No matter where you go, you can always see the moon. That's why we feel that the moon always follows us wherever we go.

11.What Is on the Moon?

Like the earth, there are mountains, valleys and flat land on the moon. However, on the moon there are no trees in the mountain, there is no water in the valleys and there is no grass on the flat land. Nor is there air or water on the moon. It is a bleak place. Although there is no life on the moon, there are plenty of mineral resources. They may be used by human beings in the future.

12. Why Is the Moon Sometimes Round and Sometimes Not?

The moon, like the earth, is round all the time. Why then does the moon we see everyday change its shape? The moon does not shine by itself. It is the sun-light that illuminates the moon so that we can see it. As the moon keeps revolving around the Earth, we will @ a round moon when the whole moon faces us. But, if only half of the moon faces us, we see half of the moon. Some-times we see a crescent moon. That means only that little part of the moon is facing us.

13. Why Do the Stars Shine in the Sky?

When the stars shine in the evening sky, they are like many lights in the sky. How do the stars shine? As we have already learned the sun is bright and hot like a huge furnace. It is fuelled by atomic energy which causes it to shine and give out heat all the time. The stars are just like the sun. Their atomic changes make them shine also. But, because they are so far from us they look like many small shining dots.

14. Why Do the Stars Twinkle in the Sky?

At night sometimes the stars twinkle like people blinking their eyes. Actually, it is the air playing a trick. The earth we live on is surrounded by a thick layer of air. Some is dry cold air and some is wet, hot and steamy. These air currents are continuously moving. When we look at the stars through this moving air layer, it appears as if the stars are moving.

15. Why Can't We See the Stars During the Day?

When you turn the light off at night, the room becomes very dark. When you light a candle in the dark room, it seems very bright. But if you turn on the light and put the candle beside the lamp, the candle will look dim. This is the same with the sun and the stars. The sunlight during the day is very strong so the star light appears very weak. That is why we can't see stars during the day.

16. Why Is a Starry Night Always Followed by a Sunny Day?

Sometimes there are more stars in the sky than others. This has a lot to do with the cloud in the sky. If the cloud is thick, it will cover the star light and we won't be able to see many stars. When there is no cloud, there is less steam in the air. Therefore, we see more stars. If you see many stars at night, it means the air is dry and it will be sunny the next day.

17. Are All the Stars White?

Besides white stars, there are also yellow, red and blue ones. The colour of the star is decided by its temperature. When we put a piece of iron over a fire, it becomes red first; when it becomes hotter, the colour yellow; finally, when it is very, very hot it becomes blue. Like the iron, the blue stars have the highest temperature. The temperatures of the blue and whites tars reaches thousands of degrees while yellow and red stars are not so hot. They are about several thousand degrees.

18. Are There More Stars in Summer Than in Winter?

There are more stars in some parts of the sky than in others. The place that has the most stars is known as the Milky Way, or the Galaxy. From different positions, the number of stars is different. In summer most of the stars we see are those located in the Milky Way. Be sides, in summer people often come out to enjoy the cool in the evening, so they feel as if they can see more stars than in the winter.

19. What Is the Milky Way?

In the clear sky in summer and autumn, we can see, besides other stars, a silvery belt that looks like a river. People call it the Milky Way. This is formed by thousands of stars. If we look at them through a telescope, we can see the Milky Way is filled with countless stars. Like the sun, they are all fixed stars.

20. Are All the Stars the Same Size?

There are many, kinds of stars. Some are big and some are small. There arc nine planets revolving around the sun. The earth if, one

of them. Of the nine planets, Jupiter is the biggest. It is one thousand times larger than the earth. But Mercury and Mars, two other planets of the nine, are smaller than the earth.

Most of the stairs we see at night are suits very, very far from us. They are fixed stars. The sun is an ordinary-sized fixed star. There are lots of fixed stars that are bigger than the sun. Sirius we see in the winter night sky, Altair and Vega we see in the summer sky are all bigger than the sun. Of course there are also quite a lot of stars smaller than the sun.

The reason that stars all appear to be the same size is because they are far away from us.

21. How Far Are the Stars from Us?

The moon is the closest star to the earth. It is over 380,000 kilometres from us. It takes 100 days for us to get there by train or 16 days by airplane. The sun is much farther away. It is 150 million kilometres from us-400 times farther than the moon. It would take us more than a hundred years to reach the sun by train or over a dozen years by plane. As for the fixed stars, they are even farther away. They are hundreds of thousands or even several million times farther from the earth than the sun. Light and electric wave travel at300 thousand kilometres per second. If someone was to call us from theit would take the electric waves sun, 1more than eight minutes to reach us. But if someone was to call us from Altair, we wouldn't receive the call until 16 years later. Now you can see how far we are from the stars.

22. Are There People Living on Other Planets?

the earth we live on is a planet. Are there people living on any other planets?

answer this question, we have to talk out why there are people on the earth. A few billion years ago, the earth was only a sea of fire. There was no life on the earth, not to mention human beings. After a very, very long period of time, the earth gradually cooled down. Oceans and land appeared. Because there is air and water on the earth and the climate is mild, life evolved.

After a long period of evolution, human beings gradually came into being. There are many other planets like the earth. As long as there is water and air on them, and as long as it is not too cold or too hot, there might be life, even human life on them. However, up to now, other planets with people living on them have not been found.

23. Where Do the Sun and the Moon Go When It Rains?

As we already know, rain is drops of water from the cloud. If there is no cloud, there won't be rain. When it rains, clouds are generally

very thick and the sunlight can not possibly shine through them. Therefore, we can not see the sun or the moon. They are not hiding from us. Actually, they are hid-den by the cloud. When the rain stops and clouds disappear, we can see the sun and the moon again.

24. Why Is the Sun Bigger at Sunrise and Sunset Than It Is at Noontime?

When the sun rises from the east in the morning and falls down in the west at dusk, it looks very round and big. But at noontime it looks small and the sunlight is strong. Does the size of the sun change three times a day?

When the sun rises and sets, there are things like mountains, trees and buildings beside it that make it seem very huge. When the sun is high above us in the sky, there is nothing that can be used to compare its size with the sun, so we feel it is smaller.

25. What Is It Like at the Bottom of the Sea?

When the sea appears on TV or in the movies, it always look endless. But do you know what it is like at the bottom of the sea? The seafloor along the coast is a beautiful world. There are flat sand beaches and hilly mountains. On the mountains, there are "forests". All kinds of fish and shrimps swim back and forth in the "forest" and mountains. On the sand beaches, there are also different kinds of strangely shaped animals either taking a walk or playing with each other. Things are quite different at the deep bottom of the sea. It is very dark and there is not even a single thread of sunlight. Yet, many fish and animals still live there.

Some fish even shine!

26. Where Does the Water in Rivers and Lakes Come from?

Water always flows from a higher place to a lower place rivers and lakes are deep valleys on the earth. The snow water and spring rain water from the mountins rain water and ground water all flow into the deep valleys. Gradually, the deep valleys become rivers. When the small ditches gather together. They become small river; and several small rivers will become a big one. When spring water rain and snow water from all directions join, they form a river or a lake.

27. Why Do Floods Occur in Some Places?

Floods often occur in rainy summer and autumn. Sometime, when it rains a lot in one place for several days, the rain water will all flow into the rivers. When the rivers cannot take so much, water at onetime, the water will rise and flow out of the banks to destroy the dykes and dams. This is flood. Floods are a natural disaster and bring pain and

damage to people.

To prevent floods, trees are planted on mountains and water conservation projects are built. When it rains heavily, trees in the mountains can prevent the soil from flowing into the river and thus decrease the damage of the flood.

28. Why Is Spring Water Hot?

Spring water can be found in many places in the world. Under the ground there is hot air that heats the spring water. Sometimes it is so hot it can even bum your hand. Because spring water can be beneficial to health, some people take spring water baths. Deep underground there is a substance called magma which is extremely hot, much hotter than the fire from the stove. When the under-ground water passes there, it becomes hot water and oozes to the earth's surface.

29. Why Is There a White Circle Around the Moon?

Very, very high up in the sky there sometimes flows a stream of warm air. When it meets the cold air from the lower level, the cold and warm air mix and become cirrus.

Cinus is a kind of very thin cloud. It cannot hide the moon. It only covers the moon with a "thin gauze", which is made of countless small ice grains. When the moon shines over these ice grains and the light reflects back to the moon, we see a circle of white light around the moon. This means the weather is going to change soon.

30. Why Does the Sea Sometimes Rise and Sometimes Fall?

The rising and falling of the sea is known as rising tide and ebb tide. Why does the tide rise? Actually, it is the sun and the moon that are pulling the tide. When the water on one side is pulled, the other side of the sea falls. The earth has a special kind of attraction known as gravitation. It is this gravitation that pulls you back when You JUMP; it is also this gravitation that attracts the sea water. When there is a strong gravitation, the tide rises; when there is a weak gravitation, the tide ebbs.

31. Where Does the Dew Come from?

On summer mornings we some-times find small sparkling water drops on grass, leaves and flowers. This is called dews. Where does it come from?

In summer when it is very hot during the day, the grass and leaves become hot too. In the evening they cool down. When the moisture in the air meets the cool grass and leaves, it turns into little water drops. This is the dew we see in the morning.

32. Why Is It Difficult to See Inside a House from the Outside During the Day?

During the day when it is very bright outside, the in side of a room is relatively dark. There is more light going into the room than coming out. When you look at the window from a distance, the window looks like a dark cave and we can't see through it. But when we are in the room, we can see everything outside. This is because the light is stronger outside than inside.

At night, while the outside is dark, the room with light on becomes bright again. So when you look from the outside at night, you can see everything inside clearly. But when you look outside through the window, you cannot see anything.

33. Why Do We Seem to See Red Light When We Close Our Eyes Under the Sun?

When you look at the inside of your eyelid you will notice it is red. This is because the inside of your eyelid is covered with many, many blood capillaries through which blood runs. The eyelid is very thin. When you close your eyes under strong light, some of the light will go through the eyelid. As the eyelid is full of blood, it makes the light red, too.

34. Water Is Transparent so Why Is Its Spray White?

Water is transparent and has no colour, but the spray is white. Actually, every drop of water is colour less and transparent. When light goes through the drops of water, it is reflected on their surface. When many drops of water pile up, they reflect light from all directions. Spray is made up by many, many drops of water. They inject light into our eyes from different angles and so it appears as if the. spray is white.

35. How High Is the Sky? Can We Touch the Sky When We Ride in the Airplane?

When white clouds float in the sky, the blue sky looks very high. But how high is it really?

The sky has no ceiling so no one can tell how high it is. The sun shines upon the air in the sky and makes it look blue. The blue sky is only 50 kilometres high. Beyond that there is very little air. Under a thousand kilometres, there is almost no air and the sky is very dark. Generally, an airplane can fly as high as over a dozen kilometres. if your each out for the sky when you ride in an airplane, you cannot touch anything.

36. What Is the Earth?

The earth is a huge ball, but how big is it? If we walk around it, we will cover 40,000 kilometres. On the earth, there are mountains, water, lands, oceans, human beings, animals and plants.

The earth is a planet. It revolves from west to east all the time. It takes 24 hours for the earth to make one complete turn. The earth also rotates around the sun. One circle takes one year and we grow one year older.

37. Why Can't We Feel the Movement of the Earth?

When we ride in a smooth car or ship, we cannot feel it moving. But when we look out, we feel the objects outside are moving backwards. The faster the car, the faster the objects move backwards. As the earth has gravitation, we are firmly attracted by it. Besides, the earth is very big and turns very smoothly, we cannot feel its movement. But everyday when we see the sun, the moon and stars rising from the east and setting in the west, then we know that the earth is turning from the west to the east.

38. What Is It Like Inside the Earth?

Like an egg, the earth has three layers. The outer layer is known as the earth's crust which is formed by solid rocks; the middle layer is called the mantle which is formed by softer rocks; the inner part Is the earth's core which is so far from the earth's surface that no one has ever seen it. After many years of research, scientists think that the core is made of iron ore and some other materials. Both the temperature and pressure are very high. Whether the guess is correct or not still remains a question. This puzzle is yet to be solved by future scientific research.

39. Why Is It Very Hot in Summer?

The climate of the four seasons varies from place to place. In the Northern Hemisphere, winter is very cold and summer very hot. Spring and autumn are not too cold or too hot. But why is it very hot in summer?

The change of climate depends on the amount of heat the sun gives to the earth. While revolving by itself, the earth also rotates around the sun. In different seasons, the amount of sunlight given to the earth is different, too.

In summer, the sun shines almost direct-ly over the Northern Hemisphere, so the day is longer than night and the earth receives the most heat. That is why it is very hot in the Northern Hemisphere in summer.

40. Why Is There Day and Night?

The earth we live on revolves all the time. It cannot shine by

itself. When the side we live on turns to the sun, it is day; when it turns to the other side of the sun, it is night. When the earth revolves one circle, it is one day and one night. The earth keeps revolving and the day and night keep changing.

41. Why Are There Volcanic Eruptions on the Earth?

Volcanic eruptions often happen on the earth. When a volcano erupts, the very hot magma that spurts out from the volcano will flow everywhere, flooding crops and houses. Why are there volcanic eruptions on the earth?

On the surface of the earth, there is a very thick layer of crust that wraps the magma tightly inside it. The temperature inside the earth is very high. The magma flows back and forth inside the earth and always tries to find an outlet. At some places where the earth's crust is thin and its movement violent, and when the crust is pressured, the magma will spurt out. This is an erupting volcano.

42. Where Do Mountains Come from?

There are many mountains on the earth. Some are high and some are low. Some are ranges a few hundred or even a few thousand kilometres long, and some are solitary mountains. Mountains all come from the earth. A long, long time ago, the surface of the earth was not as solid and stable as it is now and on the earth there were a few big continents separated from each other. As the bumped against each other, some earth surfaces grew higher and higher. As the years went by, they grew into today's mountains. There are also mountains that are formed out of volcanic eruptions.

43. Where Does the Desert Come from?

Some places on the earth are covered with endless stretches of sand. Such a place is called a desert. How did these places become desert? A long, long time ago, the earth was covered by rocks. After being exposed to wind, sun, rain and cold weather for thousands of years, many rocks broke to pieces and the small ones broke to form sand. When sands accumulate, they gradually become deserts. Trees can block wind so that sands will not flow. That's why we should protect trees.

44. Why Is It Colder in the Mountains Since They Are Closer to the Sun?

When mountain climbers climb the high mountains covered by the snow, the year wear thick down coats. Why is it colder in the mountains since they are closer to the sun? On the surface of the earth, there is a very thick layer of air. It is like a thick quilt and keeps the earth warm. But this layer of air is not evenly distributed. The closer to

the surface of the earth, the thicker the air and the warmer it is; the farther away from the earth, the thinner the air and the colder we feel.

45. Will Mountains Grow?

The earth has changed a great deal over the past few billion years. Some sea bottoms have grown into mountains and some land has sunk to the bottom of the sea. Land grows at a speed of 30 metres every ten thousand years. Therefore, mountains will still grow.

46 Why Can the Clouds Move?

Some clouds in the sky are higher and thiner and some are lower and thicker. They are in all shapes. They float in the sky as if they are moving back and forth.

Why do the clouds move?

We have already learned that when water evaporates into the sky, they become countless drops of water or ice as the temperature drops. Supported by the rising air current, they float in the air and become the clouds that we see in the sky.

The air around us flows up and down and back and forth all the time. Sometimes when we don't feel the blowing of wind, we feel as if the air is still. But actually, high up in the sky the air flows very fast and it pushes the clouds forward. That's why we see clouds moving in the sky.

47. Why Don't the Clouds Fall?

When the water on the ground evaporates into the sky and meets cold air, it becomes many drops of water which turn into clouds. The clouds float in the sky. The reason they don't fall is that the hot air and evaporation from the ground keep going up and they support the clouds like a big hand in the sky.

48. Why Do We Feel the Sky Is Low on a Cloudy Day?

Some clouds in the sky are higher and thiner and some are lower and thicker. The higher up clouds are generally thin. They are either a few strands or several clusters gathered together. The sun can still shine through these thin clouds. Sometimes the clouds are thick and low and they cover the whole sky so that the sun cannot shine through. Then the sky looks grey. Actually, it is not that the sky is low, but the clouds are.

49. Why Does It Rain?

During the day when the sun shines over the ground it makes the ground very hot. When the water evaporating from rivers, lakes and sea

meets the cold air in the sky, it becomes countless drops of water that gather together to form the clouds in the sky. When these clouds float high up in the sky and meet cold air, the small drops of water become big ones. They are so heavy that the air cannot support them any more. Then they fall down. they fall flown. This is rain.

50. How Can the Sky Be Clear When It Is Raining Nearby?

During the summer when it is very hot, the water evaporates very fast. When the water meets cold air high up in the sky, it becomes many drops of water and then clouds. They move fast. When they gather together and when the air cannot hold them, the rain falls. But around the edge of the clouds, it rains lightly. In the sky where there is no cloud, there is no rain and so it is sunny .

51. Why Is There Generally a Rainbow After a Shower?

Sometimes in summer, the sun comes out right after a shower. Then in the blue sky, a beautiful rainbow appears.

Rainbows are formed from the refraction of the little drops of water and reflection of the sunlight. Summer showers are generally short. After showers stop, there are still lots of little drops of water in the air. When the sun shines upon these sparkling drops of water, a rainbow of red, orange, yellow, green, blue, indigo-blue and purple appears in the sky.

You can also make a rainbow by doing a simple test. Stand with the sun behind you and spray a mouthful of water. Now you can see a small rainbow from the water spray.

52. Why Is the Air Especially Fresh After a Thunderstorm?

After a thunderstorm, the dust and harmful gas in the air are washed away by rain. The air becomes much cleaner and we feel the air is very fresh.

When it thunders, there is a kind of gas known as ozone which comes from oxygen. Ozone can stimulate people's nerves and make people feel excited. Besides, breathing in this kind of air also makes you feel comfortable. The resin of pine trees can also produce ozone. So when you enter a pine forest, you feel the air is very fresh, too.

53. Why Are There Hailstones in Summer?

In the summer when the sun shines over the ground, the ground becomes very hot. But high up in the sky the temperature is low. When the cold air goes down and meets the hot air that goes up, the drops of water in the hot air become little ice balls. The higher they go up, the bigger and heavier they become. Finally they fall onto the ground. They are called hail-stones.

In winter, the ground temperature is low and the difference between the temperature on ground and high up in the sky is not as great as in the summer. Besides, the air circulation is not very fast in winter. That's why there are no hail-storms in winter.

54. What Is Air Like?

Take a small plastic bag and shake it before tying it up. Now, he bag bulges because there is air in the bag. Air is made up of many kinds of gas, such as nitrogen, oxygen, carbon dioxide and steam. Because they are very light and colourless, we cannot see them. Besides, air has no smell. So we cannot smell it either.

55. Will All the Water on the Earth Be Used Up?

If we don't drink water, we will die of thirst. Without water, there will be no life on the earth. We use water everyday. But will the water be used up one day? No. There is a lot of water on the earth. Everyday, part of the water from the ground and sea becomes steam and goes up into the sky and turns into clouds. Then clouds become rain or snow and fall onto the ground. This is how water circulates.

But in places where there are many people and not enough water, and in places where there are droughts or where there are factories that use a lot of water everyday, there is a shortage.

56. How Does the Wind Start to Blow?

Wind is the circulation of air. We are surrounded by air. We all need air to breathe. There is cold air and hot air. Hot air is lighter than cold air. When hot air goes up, cold air comes down so that we have enough air. The air on ground and sea goes up when it becomes hot. Then cold air from somewhere else comes to replace it. The flowing of air is wind. Because the earth is very big, the flow of air is also great. Therefore, the wind is sometimes very strong.

57. What Is the Use of Air?

Air is a kind of colourless and transparent gas that we cannot see. People cannot do without air. Human beings and animals need the oxygen in the air to breathe and plants need the carbon dioxide to survive.

Without air, the fire will not be able to burn; birds will not be able to fly and the meteorite falling from the sky will crush the buildings on the ground. The flow of air causes wind. Clouds and rain are also formed in the air.

58. Why Do Cobblestones Have a Smooth Surface?

On some river banks or sea beaches, we can find many smooth, flat and round stones as big as egg or walnuts. People call them cobblestones.

Why do all cobblestones have a smooth surface?

On some mountains by the banks of rivers or at the seaside, there are a lot of rocks. After being exposed to the sun or rain, big rocks become small pieces of stones. Later these stones are flushed into rivers and seas by floods. After many, many years of scouring, these sharp stones are polished by the water and they become very smooth cobblestones.

59. Do You Know How to Tell Directions?

The sun rises from the east and sets in the west. In the morning, when you stand facing the sun, this is east and behind you is the west; on your left is north and right, south.

During the year, the sun does not always rise from the due east. To know the correct direction, we need the shadow to help us. You can erect a pole on the ground. At noon time when the shadow of the pole is the shortest, the sun's position is the due south. In the evening, the North Star can also help decide the direction.

60. Why Can Spring Water Make Noise?

Sound or noise comes from the vibration of objects. When water vibrates, it also makes noise. Different water vibration makes different noises.

When the spring water falls down from a higher place, it falls down with part of the air. In the spring water, the air becomes water bubbles. When these bubbles break, they make noise. At the same time, when the spring water touches stones or tree branches, it also makes noise. If a spring is beside a mountain cliff or in a cave, you can hear the echo of the failing drops of water.

61. How Are Echoes Made?

When we shout, the sound goes in all directions. When it touches a high wall, it reflects. The reflected sound travels a longer distance than the sound we hear. So, we always hear the real sound first and then the reflected sound. This reflected sound is known as an echo.

When we talk in a room we are very close to walls and our voice overlaps the reflected sound, so we cannot hear the echo. If we talk in a big room, we can hear the echo. If you stand on a mountain top and shout towards the mountains facing you, you will hear the echo.

62. Why Do Things Around Us Have Different Colours?

Things like houses, trees and bridges have no light, but they can reflect the sunlight. When the reflected light projects into our eyes, we can see them.

When objects are illuminated by light they always absorb and

reflect part of the light. As different things absorb different colours and amount of light, they reflect these colours and amounts of light. The colour of the reflected light is the colour we see; the more the reflected light, the brighter it is; the less the reflected fight, the darker it is. Different things have different colours. Some are very bright and some are less bright.