Dr.BRR GOVERNMENT COLLEGE - JADCHERLA

Department of Physics

STUDENT STUDY PROJECT

On

A STUDY ON SOLAR SYSTEM

SUBMITTED BY

☞ AYESHA	Bsc(MPCS)	III YEAR
☞ M.DEEPIKA	Bsc(MPCS)	III YEAR
☞ R.MOUNIKA	Bsc(MPCS)	IIIYEAR
☞ M.NIKHITHA	Bsc(MPCS)	IIIYEAR
☞ MUNNAWAZ BEGUM	Bsc(MPCS)	III YEAR

SUPERVISOR

Dr.K.Manjula
Assistant Professor
Department of Physics
Dr. BRR Government college
Jadcherla-509 301

B.Udaykumar
Assistant Professor & HOD
Department of Physics
Dr.BRR Government College
Jadcherla-509 301

External Examiner

Internal Examiner

Department of Physics

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Dr.BRR GOVERNMENT COLLEGE - JADCHERLA
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Supervisor **Head of the Department** **principal**

Dr.B.R.R. Govt. Degree College
Jadcherla

DR. BRR GOVERNMENT COLLEGE - JADCHERLA

Department of Physics

DECLARATION

We hereby declare that the project workentitled with "A STUDY ON SOLARSYSTEM" Dr. BRR Government College, Jadcherla, Mahabubnagar District Telangana is a genuine ork done by us under the supervision of K.Manjula, and Sri B.Udaykumar Assistant ofessor in Physics, Department of Physics, Dr.BRR Government Degree college, Jadcherla d it has not been under the submission to any other Institute/University either in part r in full, for the award of any degree.

AME OF THE STUDENT	CLASS	H.T.NUMBER	SIGNATURE
YESHA	III YEAR	20033006468003	Ayesha
.DEEPIKA	III YEAR	20033006468023	M.Deepika
.MOUNIKA	III YEAR	20033006468035	R.Mounika
.NIKHITHA	III YEAR	20033006468024	M.Nikhitha
UNNAWAZ BEGUM	III YEAR	20033006468031	Munnawaz

B.UdayKumarMSc,BEd., NET (Ph.D.)
Assistant Professor and Head of Physics
Email:udaymay1985@gmail.com
Mobile: 9989943665
Dr. BRR Government College
Jadcherla – 509 301
Mahabubnagar District
Telangana State, India.

Dr.K. Manjula MSc,BEd.,Ph.D.,SET
Assistant Professor of Physics
Email:komamegerimanjula@gmail.com
Mobile: 9885627542
Dr. BRR Government College
Jadcherla – 509 301
Mahabubnagar District
Telangana State, India.

CERTIFICATE

This is to certify that the project work entitled ***STUDY ON SOLARSYSTEM, Dr. BRR Government College Campus, Jadcherla, Mahabubnagar District, and Telangana.*** *Is a bonafide work done by the students of III MPCs (EM).* ***Ayesha, M. Deepika, R.Mounika, M.Nikhitha, Munnawaz Begum*** *my supervision for the award of Project Work in Physics, Department of Physics, Dr. BRR Government Degree College, Jadcherla and the work hasn't been submitted Physics other College/University either in part nor in full, for the award of any degree*

B. Uday Kumar
Assistant Professor and HOD
Dept.Of Physics

Dr.K.Manjula
Assistant Professor
Dept.Of Physics

Signature Of External examiner

Signature Of Internal examiner

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..... AYESHA, M.DEEPIKA, MOUNIKA, M.NIKHITHA, MUNNAWAZ BEGUM

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INTRODUCTION AND NEED OF THE STUDY

CHAPTER-1

OUR SOLAR SYSTEM

When it comes to learn about the solar system, creating a model is an excellent way to visualize and understand the different planets, their positions, and their movements. A solar system model can be created using a variety of materials, including thermocol balls.

Preparing a solar system model is an exciting and educational project that can teach about the vastness of our universe. By creating a scaled-down version of our solar system, we can gain a better understanding of the size and distance between each planet and their relationship with the sun.

The sun is the center of our solar system. It is the largest body in our solar system. Nine planets follow paths called orbits around the sun. The shape of each orbit is called an ellipse. An ellipse is a flattened circle; the nine planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

The solar system consists of eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Each planet has unique characteristics and features, such as size, composition, atmosphere, and temperature. Studying the planets can help us understand the conditions necessary for life to exist and the potential for habitable worlds beyond Earth. Planetary exploration has revealed many fascinating discoveries about the planets in our solar system. For example, NASA's Mars rovers have found evidence of water on the red planet, suggesting that it may have once supported life. The Cassini spacecraft has captured stunning images of Saturn's rings and moons, providing new insights into the planet's formation and evolution.

EXPLAINATION OF SOLAR SYSTEM

Our solar system consists of the Sun, and everything bound to it by gravity - the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.

The sun is a ball of hot, glowing gases. It is much hotter than any of the nine planets. The outermost layer of the sun that we can see is about 10,000°F (5,600°C). The hottest the oven in your kitchen gets is about 500°F (260°C)! The sun is the most important part of our solar system. It gives us warmth and light. Without the sun, our Earth would be very cold. If there were no sun, there would be no life on Earth.

The sun is a star. It is the closest star to Earth. At night we can see many stars in the dark sky. During the day when we can see our star (the sun) shining, its light is so bright we cannot see the other stars. Some stars are hotter than our sun, others are cooler. Some stars are bigger than our sun and other stars are smaller, but they are so far away from Earth that they look like tiny points of light. Our sun is 10 times larger than the largest planet, Jupiter.

Our sun is the closest star to Earth. It gives us warmth and light.

Mercury is the closest planet to the sun. Because it is so close to the sun, Mercury gets very hot. During the day the temperature on Mercury can get as high as 800°F (430°C). The hottest it has ever gotten on Earth is about 135°F (60°C)!

At night when it is dark Mercury can also get very cold, as cold as -280°F (-175°C). This happens because there are no clouds and very little air surrounding the planet. The atmosphere helps to keep a planet warm when the sun is not shining. Mercury's very thin atmosphere cannot keep the planet warm at night.

The surface of Mercury is hard and rocky. Mercury has cliffs and valleys just as Earth does. The surface of Mercury is covered with craters. There is no liquid water on Mercury. An American spacecraft flew past Mercury and took pictures of one half of this rocky, hot-and-cold planet.

Venus is the second planet from the sun. We can call Venus our neighbour because it is the closest planet to our Earth. Venus is the hottest planet in the solar system, even though it is farther from the sun than Mercury. It can get as hot as 900°F (480°C) on Venus. The temperature can get this high because Venus has a thick atmosphere. The air around the planet is mostly a gas called carbon dioxide. The carbon dioxide traps the heat from the sun on the planet's surface. This is called the greenhouse effect. A greenhouse on Earth is designed to trap heat to help plants grow.

Venus is a very dry planet. It is covered by thick clouds. Earth's clouds contain water, but Venus' clouds contain sulfuric acid. These clouds are so thick that astronomers on Earth cannot see the surface of the planet with their telescopes. Soviet spacecraft landed on Venus and sent back pictures of its surface. In 1990 the American spacecraft Magellan began orbiting Venus, using radar to "see" through the clouds. These radar pictures show craters, mountains, volcanoes, and valleys on the surface of Venus and Venus is a cloud-covered planet. With radar we can see its mountains and valleys.

The third planet from the sun is Earth, our home. Earth does not get as hot as Venus. The highest temperature ever recorded on Earth is about 135°F (60°C). The lowest recorded temperature is about -125°F (-85°C).

The surface of Earth is similar to the surfaces of Mercury and Venus. Earth is a hard, rocky planet. There are high mountains, valleys, volcanoes, and even some craters. Earth is different in some very important ways. Most of the planet is covered with water. Also, the air is made of

nitrogen, oxygen, and carbon dioxide. It is just right for us to breathe! Earth is home to people, plants, and animals because it has both water and the right kind of atmosphere. American astronauts took the first pictures of the whole Earth from a spacecraft traveling to our moon in 1968. Earth is our home. It has air for us to breathe and is warm enough for us to live.

Mars is the fourth planet from the sun. Mars can get very cold. The temperature can get as low as -200°F (-130°C). In a few places it can be a pleasant 80°F (30°C) during the day. In most places it never gets above freezing.

Mars is a hard, rocky planet. The soil on Mars contains iron oxide (rust), which makes the ground look red. This is why Mars is often called the red planet. Sometimes the red dirt is stirred up by strong winds. These huge dust storms can last for months. Mars has mountains, canyons, volcanoes, and craters. Scientists think that the large canyons were formed long ago by water.

There is no liquid water on the surface of Mars now. There may be frozen water under the surface. There is ice on the surface at the coldest places. Mars has an atmosphere made almost entirely of carbon dioxide and traces of nitrogen and other gases. American and Soviet spacecraft were sent to Mars to study the planet. Two spacecraft landed on Mars. They studied the atmosphere and collected soil samples to look for signs of life, but no life was found. Orbiting spacecraft also studied the two small, rocky moons of Mars. Mars has mountains, volcanoes, canyons, valleys, and craters.

Jupiter is the fifth planet from the sun. Because it is so far from the sun, its temperature is only -220°F (-140°C) at the cloud tops.

All that astronomers can see when they look at Jupiter through a telescope are the tops of the clouds in its atmosphere. These clouds are made of frozen gases such as ammonia and water. These colorful clouds cover the entire planet, making it look white, brown, red, and orange. Jupiter's Great Red Spot is a storm which has been going on for over 300 years!

The atmosphere is mainly made of two gases, hydrogen and helium. Deep in the atmosphere the gases are pressed together so much that they turn into liquid. It would be impossible to land a spacecraft on Jupiter. The pressure deep in the atmosphere is so great that a space.

When we look at Jupiter we see the clouds in its atmosphere. Wecan also see the Great Red Spot.

Jupiter's smaller moons are probably made of rock. Three of the Galilean moons are thought to be made of ice and rock. The fourth moon, Io, is covered with sulfur. Spacecraft flying by Io took pictures of active volcanoes on this moon. Volcanoes on Earth erupt lava, but the volcanoes on Io seem to erupt liquid sulfur.

Saturn is the sixth planet from the sun. It is a lot like Jupiter. The temperature at Saturn's cloud tops is -285°F (-175°C). When astronomers look at Saturn through a telescope they see the cloud tops. These clouds are made of frozen gases such as ammonia and water. Saturn's clouds are not as colorful as those covering Jupiter.

Saturn's atmosphere is similar to Jupiter's atmosphere. It is mainly made of two gases, hydrogen and helium. Deep in the atmosphere the gases are pressed together so much that they turn into liquid. A spacecraft traveling down through the atmosphere of Saturn would have the same problem as a spacecraft traveling through the atmosphere of Jupiter. The pressure is so great that a spacecraft would be crushed. Scientists think that at the very center of Saturn there may be a core of ice and rock about the size of Earth.

The United States sent several spacecraft to fly by Saturn. These spacecraft took pictures of the planet, its moons, and its rings. Saturn has the most spectacular rings in the solar system. These rings are made of billions of small chunks of ice and rock. Each of these pieces is like a tiny "moonlet" that orbits Saturn just as the big moons do. Even though these wide rings stretch out far beyond Saturn's cloud tops, they are probably less than 100 feet (30 meters) thick.

Saturn's largest moon, Titan, is the second largest moon in the solar system. It is larger than some planets. When we compare Saturn and Titan to other objects in the solar system. Titan

has an atmosphere of nitrogen and methane. We have never seen the surface of Titan because its sky is filled with a haze similar to smog. Scientists believe that the surface of Titan may be covered by an ocean of liquid methane. The next six largest moons appear to be made mostly of ice. The smaller moons are probably made of rock or ice and rock. When we look at Saturn we see its clouds. We can also see its beautiful rings.

Uranus is the seventh planet from the sun. When astronomers look at Uranus through a telescope they see some clouds and the atmosphere above the clouds. These clouds are made of frozen methane. Methane is a gas which we use for cooking and heating on Earth. The temperature at the top of the clouds is -370°F (-220°C). The clouds of Uranus appear bluish-green because of the methane gas in the atmosphere above them.

The atmosphere below the clouds is mainly made of hydrogen and helium. Deep in the atmosphere the gases are pressed together so much that they turn into liquid. Scientists think that at the very center of Uranus there may be a core of ice and rock. The United States sent a spacecraft to fly by Uranus. It took pictures of the planet and its rings and moons. The moons are probably made of ice and rock.Uranus is covered with clouds. The clouds look blue-green.

Neptune is usually the eighth planet from the sun. Sometimes Pluto moves closer to the sun. Then Neptune is the ninth planet from the sun for a while. The temperature on Neptune above the clouds tops is -355°F (-215°C).The clouds of Neptune are made of frozen methane. These clouds appear blue because of the methane in the atmosphere above the clouds. The atmosphere below the clouds is mainly made of hydrogen and helium. Neptune has a Great Dark Spot. This is probably a storm similar to the Great Red Spot on Jupiter. The very center of Neptune may be a core of ice and rock. The United States sent a spacecraft to fly by Neptune. The spacecraft took pictures of the planet and its moons. Neptune's largest moon, Triton, has a surface of frozen nitrogen and methane. Pictures of Triton show features that appear to be volcanoes erupting liquid water and ammonia. The smaller moons are probably made of rock or ice and rock.When we look at Neptune we see its blue clouds. We can also see the Great Dark Spot.

REVIEW AND LITERATURE

CHAPTER-2

This solar system model had done by most of the people but we made changes to this project for better view of planetary model. The previous projects on solar system had made open type that can be seen everyone but we made a change that can be seen by one person.

For this we cover the solar system model with cardboard throughout the system and made a hole to see the solar system for better view of solar system. To view solar system clearly we connected a LED bulb for lightening and give beautiful view of solar system and we use dc motor for rotation of solar system.

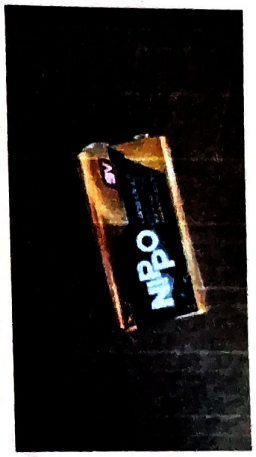
It helps for better understanding and beautiful view of solar system and it gives a practical view of solar system. We think that we madebetter and beautiful changes from the previous projects and our planetary model is more innovative and better model than other project models.

It gives a reality view of solar system and make helpful for student making curious and encouragement to study about solar system and better understanding about it and mainly it gives a hologram view made teachers easy explanation and will be remembered forever.

MATERIALS & METHODS

We use this scale model to understand distances in outer space, relative sizes of the planets and the sun, travel times in outer space, and just how far the planets get from each other as they orbit around the sun.

Supplies for Building a Solar System



- Nine thermocol balls of varying sizes.
- Wooden sticks.
- Battery of 9 volts.
- Paint and paintbrushes.
- Two switches
- Transparent tape
- Connecting wires
- Connector(that connects with external current)
- Charts(blue & black)
- Glue gun and fevicol
- DC motor(for rotation)
- Cardboard box

Solar System Model

1. Wesortedthethermocol balls into variousdifferent sizes

2. Wepainted the thermocol balls with different colors as needed

3. Cardboard box for insertion of planetary model.

4. Glue up everything.

5. Used DC motor, battery, connector and switches for lightening and rotation of planetary model.

6. Charts used for covering

7. Put it all together in a cotton box

BUILDING OF SOLAR SYSTEM MODEL

Building a solar system model is not a difficult task if we can visualize it. Building a practical model of the solar system is not possible but we can make a correctly scaled model.

Furthermore, use a different size for reference to the planet and sun. Like the sun would be around an 8-inch and earth would be around the size of peppercorn. In this situation, the entire model would be around a diameter of 10m. So, the question that arises is how it makes it compatible with a science project.

Furthermore, the inside of the box either dark blue or black. In addition, paint some stars and galaxies with white paint or with glow in the dark paint for a more realistic effect. Model would be around a diameter of 5-10m. So, the question that arises is how it makes it compatible with a science project.

Sort the thermocol balls

We sorted the thermocol balls in four different sizes. The largest ball should be the sun and the next largest ball should be Jupiter and Saturn, after that Uranus and Neptune, and then Mercury Venus Earth, and Mars.

Paint to planets

Paints the balls using different colors likeOrange or yellow for the sun

- ✓ Brown for mercury
- ✓ Brownish-yellow for Venus, Saturn, and Jupiter
- ✓ Red for MarsBlue for Earth, Neptune, and Uranus.

We painted the display and layed a cardboard box in a way that we made that the planetary model can be seen, then we fixed a DC motor which is attached to a small fan for rotating solar system.

We used sticks for position of planets in the solar system.

We attached thermocol balls to the sticks by using glue; by this we connect our planets to the model.

We had purchased all this things from stationary and electric shop beside to our college and we had purchased a cardboard box in stationary shop

Cardboard box is used for covering the planetary model. For balancing the DC motor we use a upper part of the bottle.

We used two switches and 9V battery mobile charger for connection

We connect a LED bulb to the battery connected by using wires

We connected rotating system to the charger for the purpose of rotating solar system by using external current.

We used transparent tape for covering the cardboard box and this tape is used to view solar system from outside of cardboard box.

We used charts (blue and black) for covering the cardboard box

METHODOLOGY

First we took a cardboard box then we attached the painted thermocol balls using sticks attached to dc motor then we connect dc motor to therotating fan and glue up sticks to it then charger wire is used to takecurrent from outside and supplies current to dc motor for rotating.

We inserted a LED bulb into the corner of the cardboard which is connected to the 9v battery using wireswe used two switches for the purpose of on and offso that we can handle the solar system.

We covered the cardboard box with charts stick by glue and transparent tape.

We arranged the solar system model into the cardboard box and we keptsmall hole into the cardboard sheet to observe the view of solarsystem from outside of the cardboard. We use LED bulb to light up the solar system.

Finally by using these switches we rotate the solarsystem model to know the elliptical view of the solar system.This modelhelps for better understand and make students learn about the solarsystem.

Another benefit of preparing a solar system model is gaining a better understanding of the orbit and rotation of each planet. By placing each planet in its appropriate location and orientation, we can see how they move around the sun and rotate on their axes.

This can help us understand phenomena such as seasons and day/night cycles on each planet and how they differ from Earth's. Additionally, we can observe how the gravitational pull of each planet affects the others and how it contributes to the stability of our solar system.

Preparing a solar system model can be an excellent educational tool for students of all ages. It can help them develop critical thinking skills and an appreciation for the wonders of our universe.

Additionally, it can inspire curiosity and creativity, leading to further exploration and discovery. By engaging in hands-on activities such as building a solar system model, students can learn in a fun and interactive way that enhances their understanding and retention of concepts.Our solar system consists of our star, the Sun, and everything bound to it by gravity - the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune; dwarf planets such as Pluto; dozens of moons; and millions of asteroids, comets, and meteoroids.

CONCLUSION AND FURTHER SCOPE TO STUDY

CHAPTER-5

Teaching children about outer space nurtures their natural sense of curiosity and wonder. Many children are fascinated by the vastness of the universe, and introducing conversations about things like the planets and solar system will engage and nurture their inquisitive minds.

Building a solar system model can be a fun and educational experience for people of all ages. By following the tips and techniques outlined in this reference guide, we can create a stunning model that accurately represents the size and distance of each planet from the sun. Creating a solar system model is a fun and educational project that can help us to learn more about our planetary neighbors. By using accurate colors and details, building the model in the correct order, and adding movement, we can create a stunning representation of our solar system.

Whether we were a student working on a school project or an avid space enthusiast, a solar system model is a great way to engage with the wonders of the universe.In conclusion, the study of the solar system model is a fascinating and important field of science. By exploring the sun, planets, moons, asteroids, and comets, we can gain a deeper understanding of the origins and evolution of our own planet and the universe as a whole. The historical and scientific significance of studying the solar system cannot be overstated, and the ongoing exploration of space continues to inspire and challenge us.

As we continue to learn more about the solar system, we will undoubtedly make new discoveries and encounter new mysteries. The study of the solar system is a never- ending journey of exploration and discovery, and one that will continue to captivate and inspire us for generations to come.

To prepare a solar system model, we referenced materials, including books, online resources, and scientific journals. These materials will provide us with accurate information about the size, shape, and distance between the planets. Some useful resources include NASA's website, the Hubble Space Telescope's image gallery, and the European Space Agency's space exploration archives.

The solar system is a fascinating subject that has captivated scientists and enthusiasts for centuries. One of the best ways to understand the layout and composition of our planetary neighborhood is by creating a model. We will explore the reference materials needed to prepare a solar system model, including the different types of models available and the tools required to create them.

The outer planets are the four giant gas planets located beyond the asteroid belt. They have thick atmospheres composed mainly of hydrogen and helium, and lack solid surfaces. To study the outer planets, scientists use spacecraft such as Voyager, Galileo, and Cassini, which can fly by or orbit these planets and collect data on their magnetic fields, moons, rings, and weather patterns. The outer planets also have many interesting features, such as Jupiter's Great Red Spot, Saturn's rings, Uranus's tilted axis, and Neptune's blue color and strong winds.

Reference websites

www.solarsystem.com

www.planeterymodel.com

Reference books:

Solar system, ourplanets etc.....

CHAPTER-7

STUDY AREA