St. Joseph College of Teacher Education for Women

Ernakulam

CRITERION II

2.4.5 Adequate skills are developed in students for effective use of ICT for teaching learning process

(Evolving learning sequences for online as well as face to face situations)

Submitted to

National Assessment and Accreditation Council (NAAC)

3rd Cycle of Assessment

2.4.5

Evolving Learning Sequences (learning activities) for Online as well as face-to-face situations

Sl No	Documentary Evidence	Page No
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Report: Training on PDF Flipbook

Name of the Event	Training on PDF Flipbook
Objectives	1. Introduce PDF Flipbooks 2. Highlight Interactivity 3. Familiarize with Tools 4. Explain Key Elements 5. Provide Step-by-Step Guidance 6. Discuss Design Considerations
Resource Person	Mrs. Reshmi R.K,Science Educator St.Joseph TTI Ernakulam
Date	November 16, 2022
Time	3.00-4.30 pm
Venue	Multi Purpose Hall

Key Concepts Covered:

During the orientation class, participants were introduced to several key concepts related to PDF flipbook creation:

1. PDF Flipbooks: The session highlighted the significance of PDF flipbooks as interactive and visually engaging documents for presenting information and content.
2. Software Tools: Mrs. Reshmi introduced the software Publuu, emphasizing its role in creating PDF flipbooks with ease. Additionally, HTML 5 was discussed as a valuable tool for web-based flipbook creation.
3. Creation Process:Participants received training on how to create PDF flipbooks, including layout design, interactive elements, and customization options.

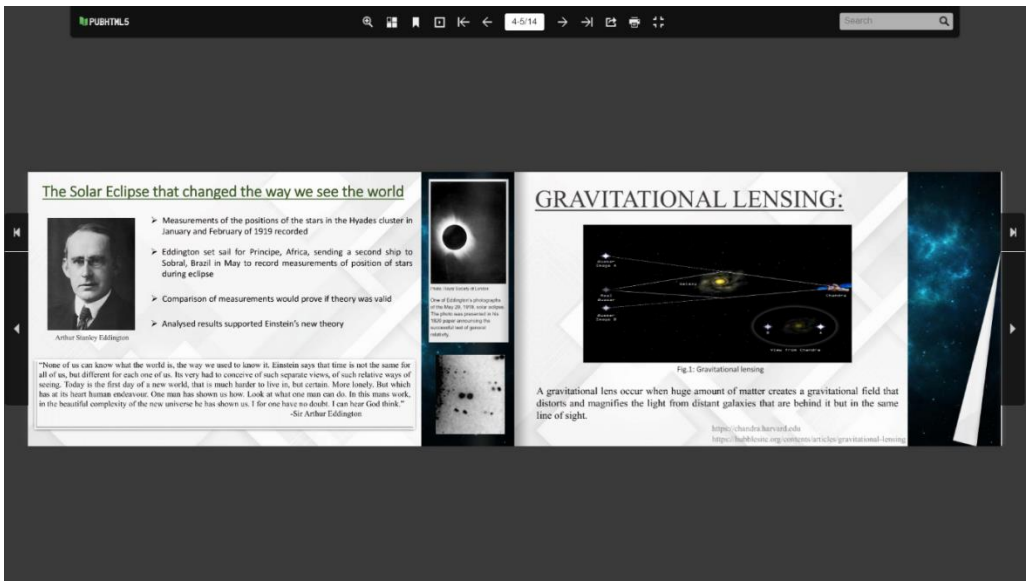
Highlights of the Session:

1. Introduction to Publuu and HTML 5: Mrs. Reshmi provided an overview of Publuu and HTML 5, explaining their functionalities and benefits in PDF flipbook creation

2. Practical Demonstration: The resource person conducted a practical demonstration, guiding participants through the step-by-step process of creating a PDF flipbook using Publuu. This hands-on experience allowed participants to understand the software's features and capabilities.
3. Interactive Training: The session included interactive training where participants had the opportunity to explore and experiment with Publuu and HTML 5, asking questions and seeking guidance as needed.

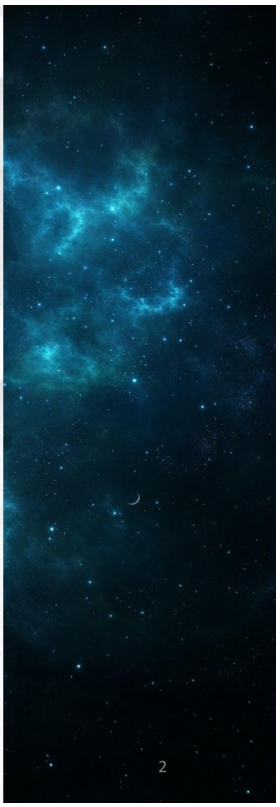
Conclusion:

The orientation class on creating PDF flipbooks conducted by Mrs. Reshmi R.K on November 16, 2022, was a valuable and informative session. Participants gained insights into the significance of PDF flipbooks and received practical training on using software tools like Publuu and HTML 5 for flipbook creation. This knowledge can be instrumental in creating interactive and engaging educational materials.



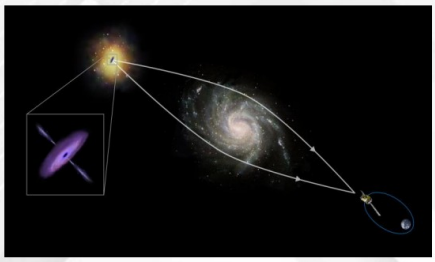
CONTENT:

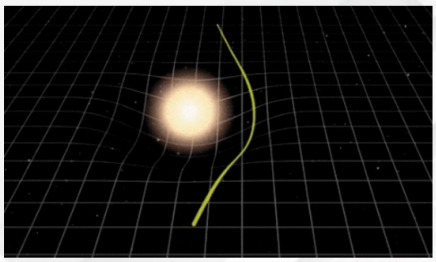
- History
- What is Gravitational Lensing?
- The First Gravitational Lens
- Types of Lensing
- Solar Gravitational Lens



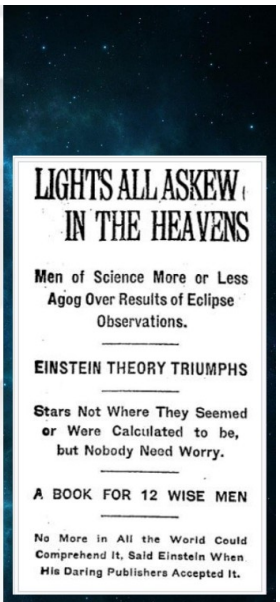
HISTORY:

- On November 1915, Albert Einstein published his theory of general relativity.
- Predicts massive objects distort the fabric of space-time





- Confirmation: Arthur Eddington observed lensing around Sun (Solar eclipse, May 29, 1919)



LIGHTS ALL ASKEW IN THE HEAVENS

Men of Science More or Less Agog Over Results of Eclipse Observations.

EINSTEIN THEORY TRIUMPHS

Stars Not Where They Seemed or Were Calculated to be, but Nobody Need Worry.

A BOOK FOR 12 WISE MEN

No More in All the World Could Comprehend It, Said Einstein When His Daring Publishers Accepted It.

The New York Times of November 10, 1919, reported on Einstein's confirmed prediction

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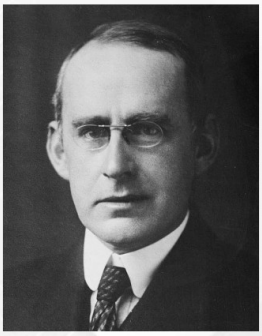
The Solar Eclipse that changed the way we see the world



Arthur Stanley Eddington

- Measurements of the positions of the stars in the Hyades cluster in January and February of 1919 recorded
- Eddington set sail for Principe, Africa, sending a second ship to Sobral, Brazil in May to record measurements of position of stars during eclipse
- Comparison of measurements would prove if theory was valid
- Analysed results supported Einstein's new theory

Photo: Royal Society of London

One of Eddington's photographs of the May 29, 1919, solar eclipse. The photo was presented in his 1920 paper announcing the successful test of general relativity.

"None of us can know what the world is, the way we used to know it. Einstein says that time is not the same for all of us, but different for each one of us. Its very had to conceive of such separate views, of such relative ways of seeing. Today is the first day of a new world, that is much harder to live in, but certain. More lonely. But which has at its heart human endeavour. One man has shown us how. Look at what one man can do. In this mans work, in the beautiful complexity of the new universe he has shown us. I for one have no doubt. I can hear God think."

-Sir Arthur Eddington

GRAVITATIONAL LENSING:

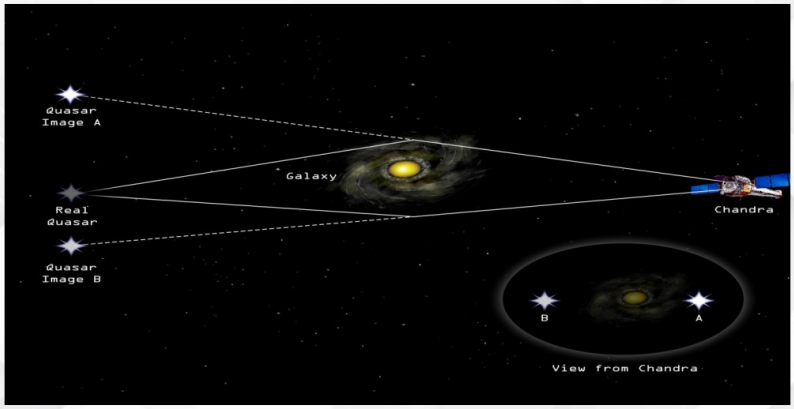
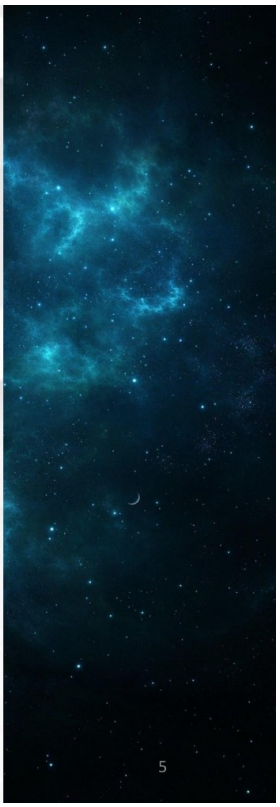


Fig.1: Gravitational lensing

A gravitational lens occur when huge amount of matter creates a gravitational field that distorts and magnifies the light from distant galaxies that are behind it but in the same line of sight.

https://chandra.harvard.edu
https://hubblesite.org/contents/articles/gravitational-lensing



THE FIRST GRAVITATIONAL LENS

- Discovered in 1979 by astronomers Dennis Walsh, Robert F. Carswell and Ray J. Weymann
- Identified the Twin Quasar Q0957+561: two quasars lying very close to each other with similar distances and spectra.
- Were actually same object whose light had split into two paths by the gravitational influence of an intervening galaxy YGKOW G1, 4 billion light-years from Earth and directly in our line of sight

Fig.2: The Twin Quasar by the Hubble Space Telescope

Fig.3: Cheshire Cat

https://www.galactic-hunter.com
https://esahubble.org

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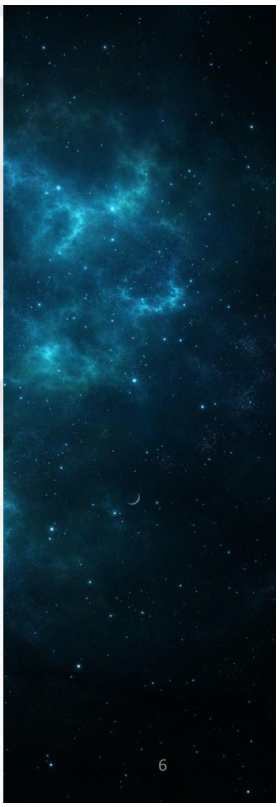

TYPES OF LENSING:

- STRONG LENSING
- WEAK LENSING
- MICROLENSING

Fig.4: ABELL 2218
https://hubblesite.org

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STRONG LENSING

- Multiple images from the same object
- Detected by large scale galaxy surveys

GALAXY LENSING

- When background source is quasar, strong lensed images are point-like multiple images
- When background source is a galaxy, strong lensed images are arcs or rings

- Eg: Einstein's Cross (Q2237+0305) at a distance of 8 billion lightyears

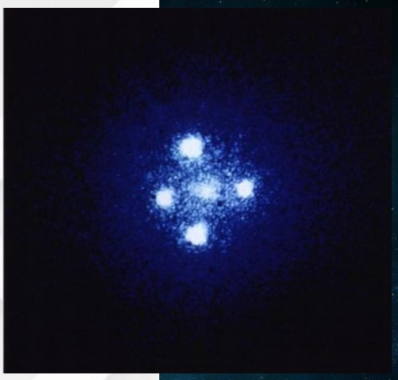

Fig.5: Einstein's Cross: four images from one quasar

https://www.nasa.gov

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Fig.6: The Cosmic Horseshoe- A gravitational lens surrounding a galaxy from the group of Luminous Red Galaxies.

https://apod.nasa.gov

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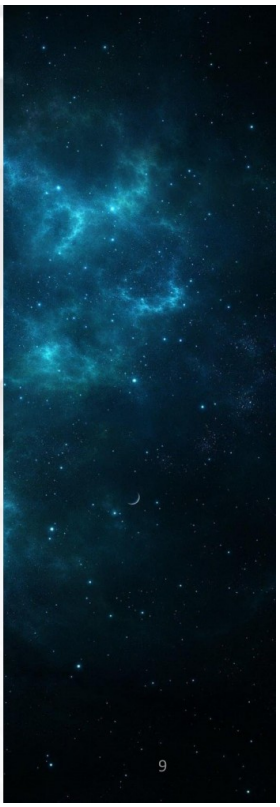

CLUSTER LENSING

- produce both strong lensing (multiple images, arcs or rings) and weak lensing effects (ellipticity distortions)

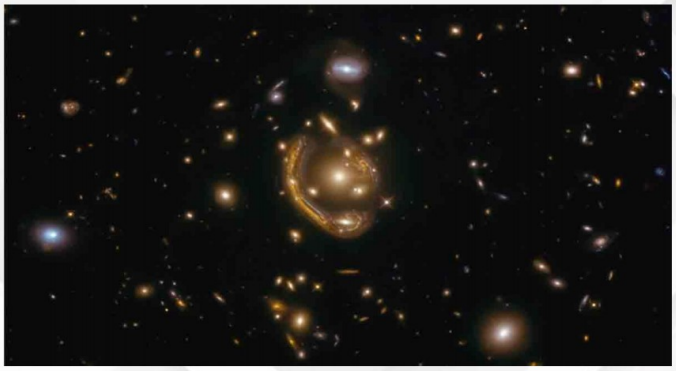

Fig.7: Located in the southern constellation of Fornax, GAL-CLUS-022058-38303 was nicknamed the 'Molten Ring' by the Hubble astronomers.

https://www.nasa.gov

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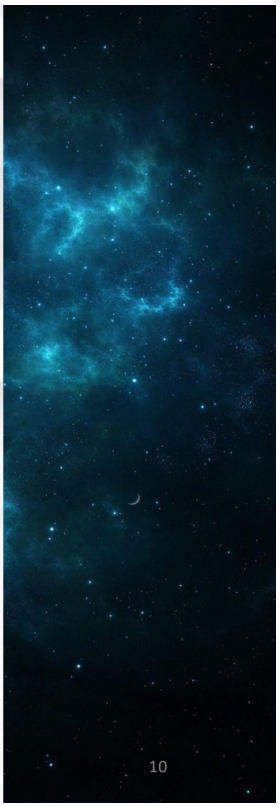


WEAK LENSING

- Occurs when the lens lies relatively far from the line of sight between the observer and the background source
- Only a single image is produced, subject to mild magnification and distortion
- Only detectable by studying effects on large numbers of background sources

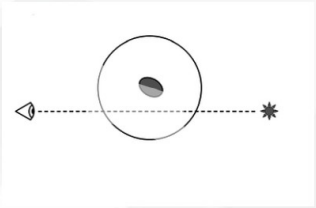
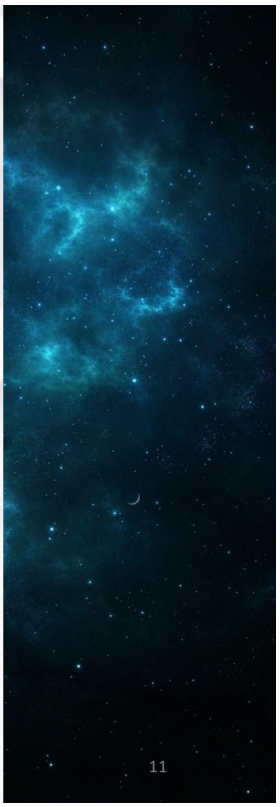


Fig.8: Weak lensing

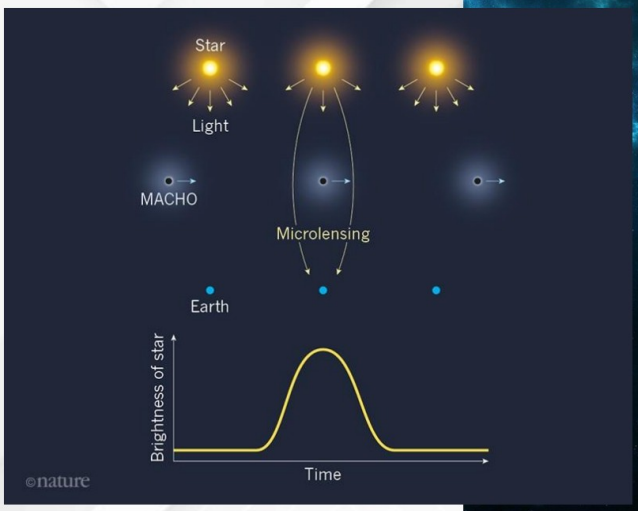
- Difficult to measure for an individual galaxy
- Galaxies clustered closer together exhibit similar lensing patterns

https://www.researchgate.net



MICROLENSING

- No distortion in shape
- Amount of light visible from object changes periodically
- Light from distant star is bent and enhanced by the gravitational field of closer star
- Used to search for very faint or invisible objects such as brown dwarfs, neutron stars, old white dwarfs or black holes, which might make up the dark matter. These are collectively known as massive compact halo objects or MACHOs
- Also for discovering exoplanets



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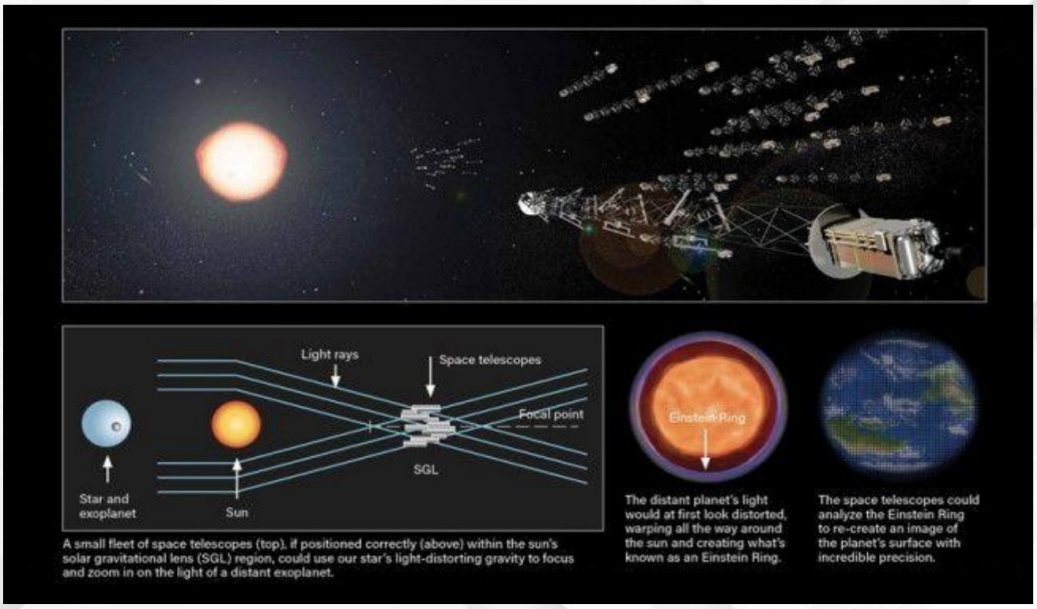
SOLAR GRAVITATIONAL LENS:



https://apod.nasa.gov/

A SGL is a theoretical method of using the Sun as a large lens with the physical effect called gravitational lensing. It is considered the best method to directly image habitable exoplanets.

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Report: Training on PPT Flipbooks

Name of the Event	Training on PPT Flipbooks
Objectives	1. Introduce Flipbooks 2. Highlight Engagement 3. Demonstrate Tools 4. Explain Key Elements 5. Showcase Examples 6. Discuss Use Cases
Resource Person	Mrs. Reshmi R.K,Science Educator St.Joseph TTI Ernakulam
Date	December 1, 2022
Time	2.00-4.30 pm
Venue	Multi Purpose Hall

Key Concepts Covered:

During the session, participants were introduced to several key concepts related to creating PPT flipbooks:

1. PPT Flipbooks as Learning Materials: The session highlighted the role of PPT flipbooks as effective and interactive learning materials that can be utilized in educational settings.
2. Benefits of Flipbooks: Mrs. Reshmi R.K explained the advantages of using flipbooks, including the ability to integrate multimedia content, making learning engaging and dynamic.
3. Step-by-Step Creation: The resource person provided a comprehensive, step-by-step guide on how to create PPT flipbooks from scratch. Participants learned about layout design, inserting multimedia elements, and incorporating interactive features.

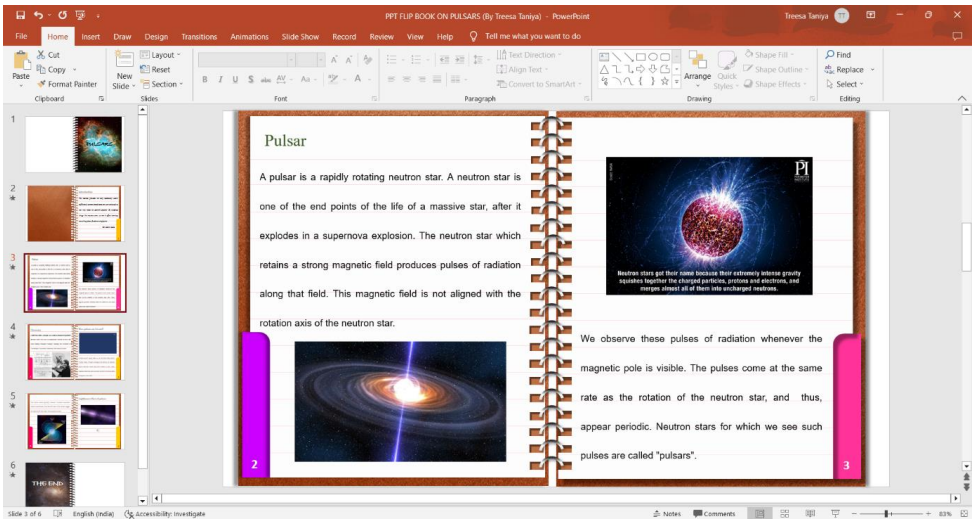
4. Multimedia Integration: The session emphasized the importance of multimedia integration, showcasing how to embed videos, audio clips, images, and animations within the flipbooks to make learning more interactive and informative.

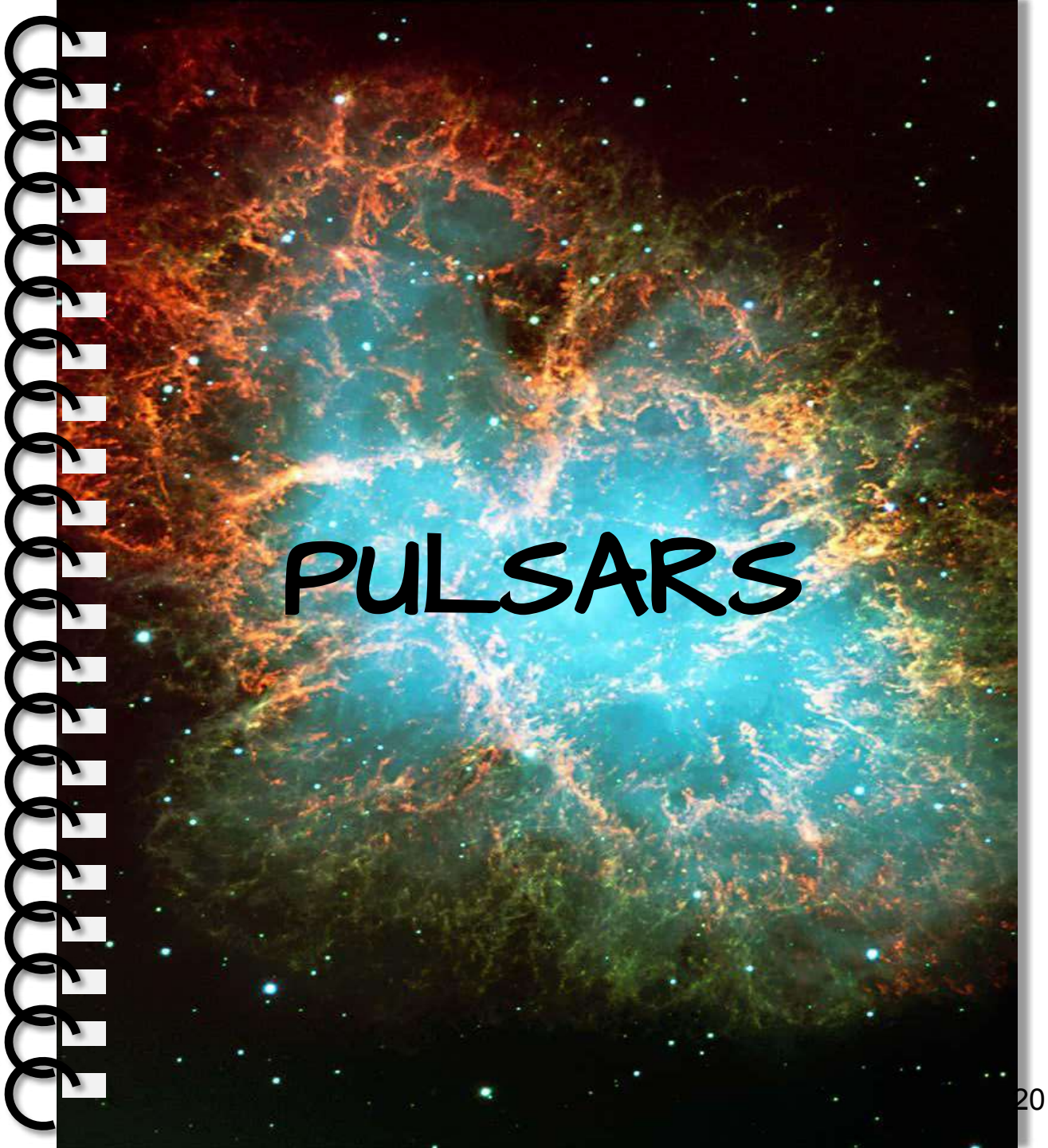
Highlights of the Session:

1. Hands-on Demonstration: Mrs. Reshmi R.K conducted a hands-on demonstration, guiding participants through the process of creating a PPT flipbook. This practical experience allowed participants to follow along and understand the steps involved.
2. Interactive Q&A: The session featured an interactive question-and-answer session where participants could seek clarifications and share their thoughts on the use of flipbooks as learning materials.

Conclusion:

The digital orientation session on creating PPT flipbooks led by Mrs. Reshmi R.K on December 1, 2022, was a valuable learning experience. Participants gained insights into the creation of dynamic and engaging learning materials that can incorporate multimedia elements to facilitate classroom interactions. This innovative approach to teaching and learning can enhance the overall educational experience.





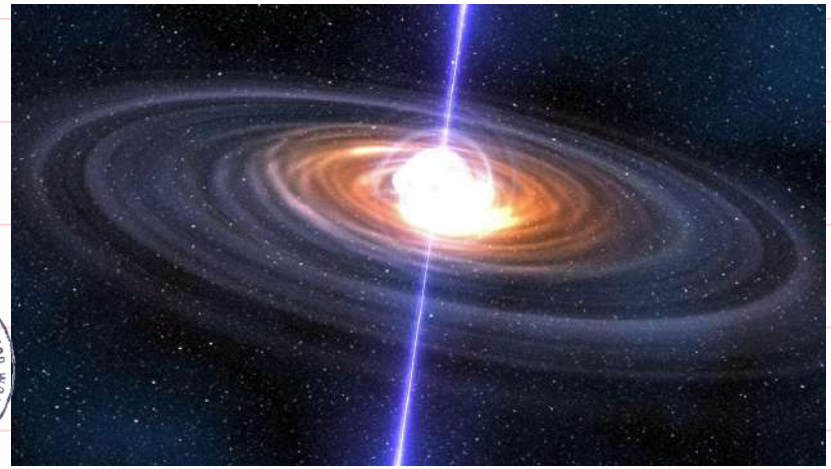
Introduction

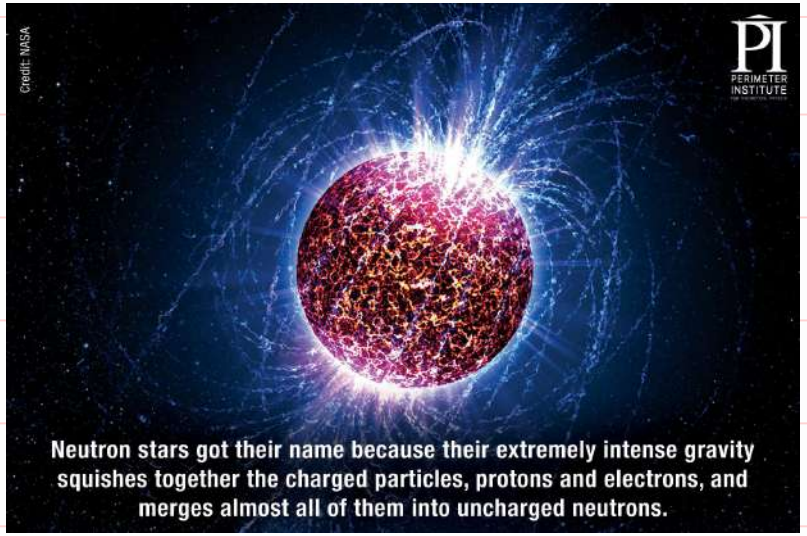
The cosmos provides the only laboratory where sufficiently extreme conditions are ever achieved to test new ideas on particle physics. By studying things like neutron stars, we are in effect learning something about fundamental physics.

-Sir Martin Reez

Pulsar

A pulsar is a rapidly rotating neutron star. A neutron star is one of the end points of the life of a massive star, after it explodes in a supernova explosion. The neutron star which retains a strong magnetic field produces pulses of radiation along that field. This magnetic field is not aligned with the rotation axis of the neutron star.

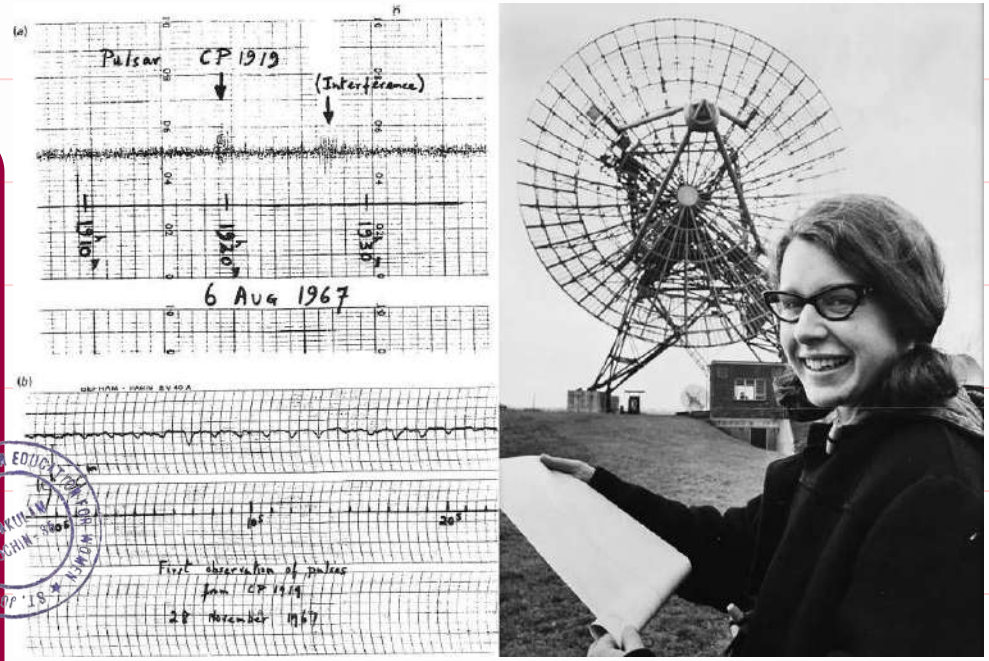




We observe these pulses of radiation whenever the magnetic pole is visible. The pulses come at the same rate as the rotation of the neutron star, and thus, appear periodic. Neutron stars for which we see such pulses are called "pulsars".

Discovery

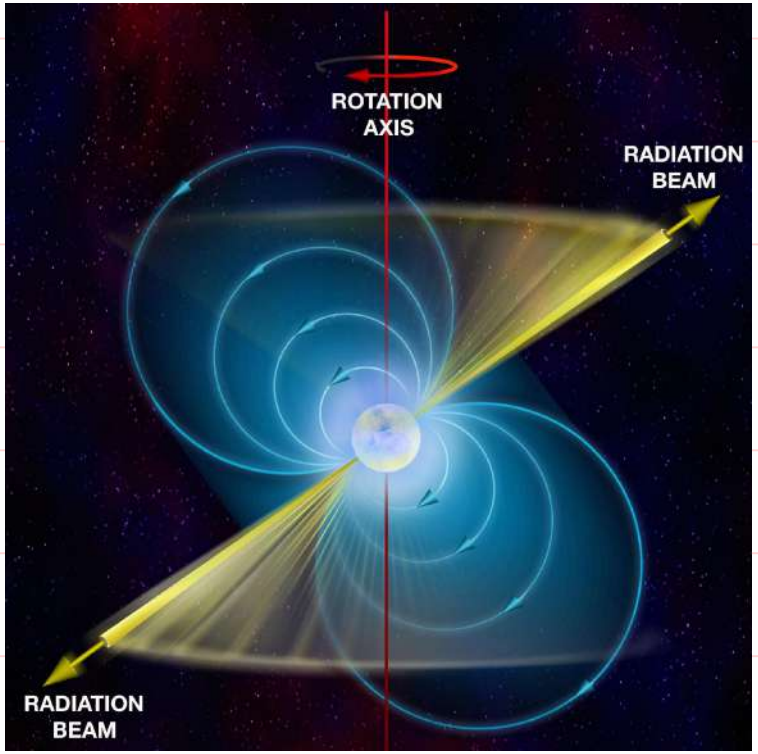
Professor Dame Jocelyn Bell Burnell discovered pulsars in 1967 while she was a postgraduate student at New Hall (now Murray Edwards College) carrying out research at Cambridge's Cavendish Laboratory with Antony Hewish.



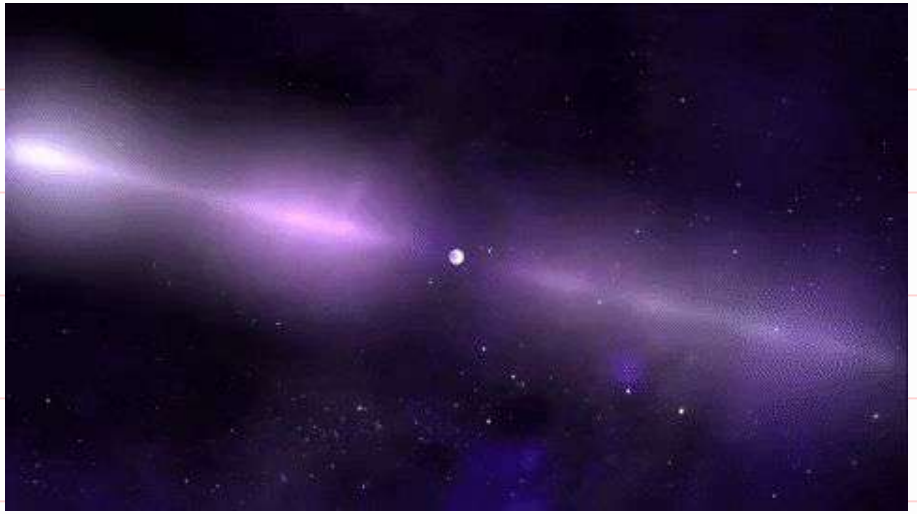
How pulsars are formed?

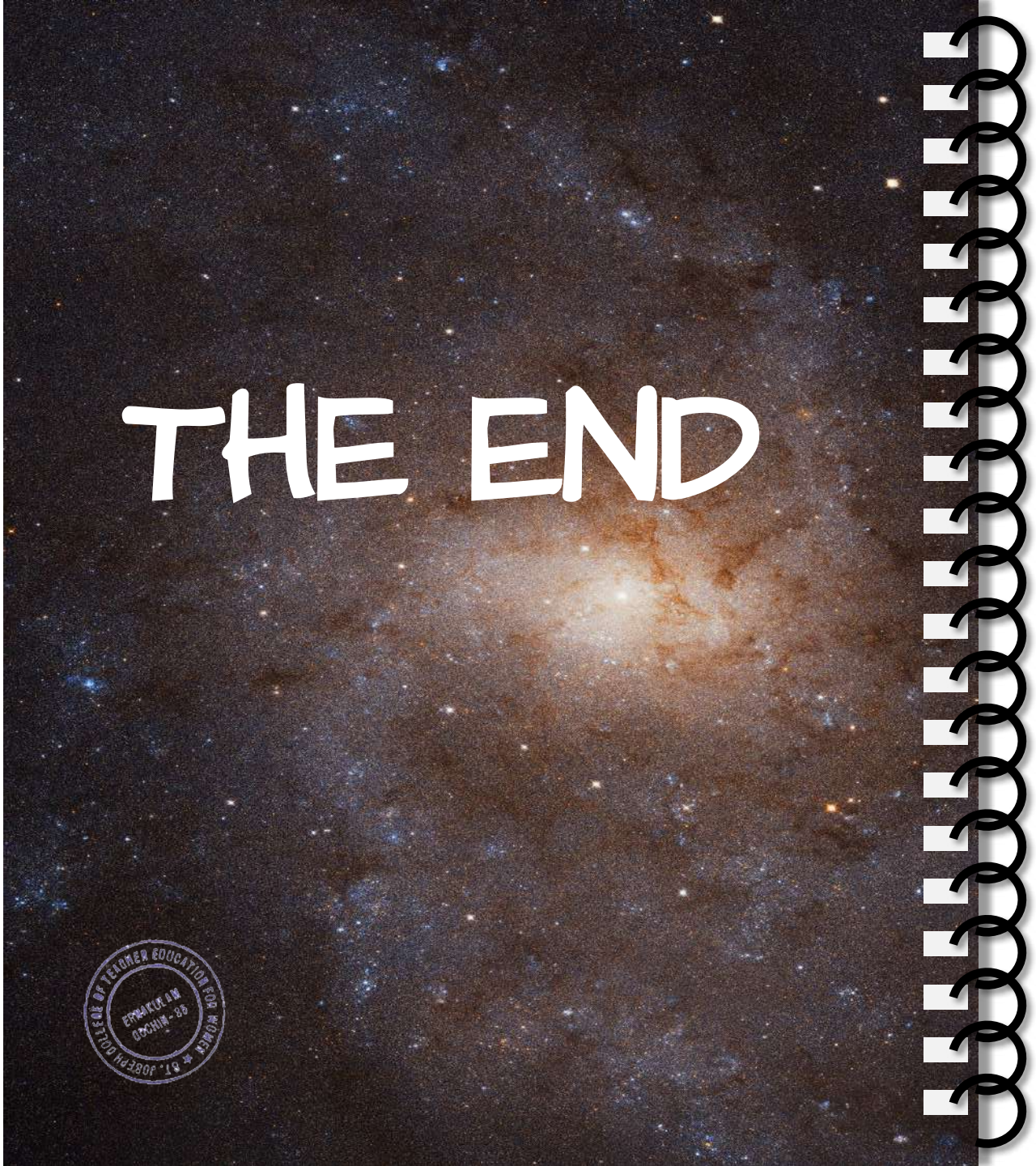
Pulsars aren't really stars — or at least they aren't "living" stars. Pulsars belong to a family of objects called neutron stars that form when a star more massive than the sun runs out of fuel in its core and collapses in on itself.

This stellar death typically creates a massive explosion called a supernova. The neutron star is the dense nugget of material left over after this explosive death.



Lighthouse effect of pulsars





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Report: Training on Digital Programmed Learning Material

Name of the Event	Training on Digital Programmed Learning Material
Objectives	The primary objectives of the orientation session were as follows: 1. To familiarize the participants with the concept of Digital Programmed Instruction. 2. To showcase the benefits and effectiveness of digital tools in educational settings. 3. To empower educators with the knowledge and skills necessary to incorporate digital resources into their teaching methodologies
Resource Person	Mrs. Reshmi R.K,Science Educator St.Joseph TTI Ernakulam
Date	November 8, 2022
Time	4.00-4.30 pm
Venue	Multi Purpose Hall

On November 8, 2022, an orientation session on Digital Programmed Instruction was conducted by Mrs. Reshmi R.K, a distinguished Science Educator at St. Joseph TTI Ernakulam. The session was aimed at providing valuable insights into the utilization of digital tools and resources in educational instruction.

Highlights of the Orientation

Concept of Digital Programmed Instruction: Mrs. Reshmi R.K began the session by explaining the fundamental concept of Digital Programmed Instruction. She highlighted how this approach enhances the learning experience by making use of digital tools to provide structured, self-paced learning modules.

Benefits of Digital Tools: The resource person emphasized the advantages of incorporating digital tools in educational practices. These benefits include increased engagement, accessibility, and the ability to cater to diverse learning styles.

Practical Demonstrations: The session included practical demonstrations of various digital tools and resources that can be used in teaching. Participants had the opportunity to explore interactive software and educational apps.

Hands-on Experience: Mrs. Reshmi R.K encouraged the participants to have a hands-on experience with the digital tools, allowing them to explore and interact with these resources.

Q&A and Discussion: A lively question and answer session followed the presentations. This allowed participants to seek clarification and engage in discussions regarding the implementation of digital tools in their teaching.

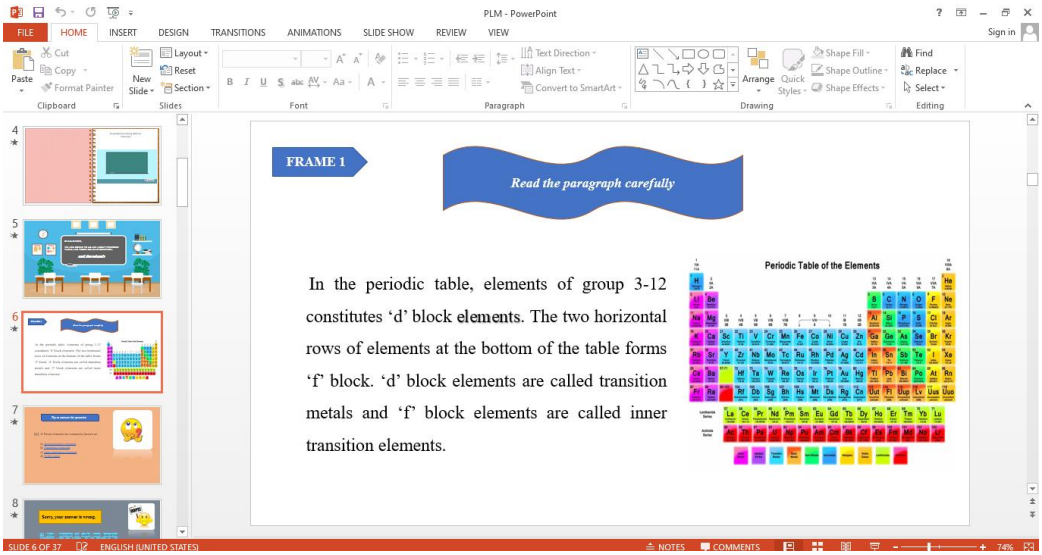
Conclusion

The orientation on Digital Programmed Instruction conducted by Mrs. Reshmi R.K proved to be an enlightening and interactive session. It equipped educators with valuable insights and practical knowledge on using digital resources to enhance the teaching and learning experience. The event was well-received by the participants, who left with a better understanding of the benefits of digital tools in education.

This orientation session is a significant step in promoting innovative teaching practices and ensuring that educators are well-prepared to adapt to the ever-evolving landscape of digital education.

Acknowledgment

We extend our sincere gratitude to Mrs. Reshmi R.K for her invaluable contribution to this orientation session, which undoubtedly enriched the knowledge and skills of all participants. We also thank the attendees for their active participation and enthusiasm.



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PROGRAMMED LEARNING MATERIAL

SUBMITTED BY

VANDANA S

1ST B.ED. PHYSICAL SCIENCE

NEXT

PREFACE

At this time, the word educational technology covers a wide range of applications. Hardware and software learning sequences are examples of instructional technology. The teaching machines, computer-assisted instruction, learner-controlled instruction, and CCTV are all included in the hardware. Programmed learning material in the form of a book or a teaching machine, as well as numerous sorts of self-instructional materials, are examples of software instructional sequences. The most relevant illustration of the most recent notion in instructional technology is programmed learning. It's a self-instructional device and educational innovation. It is not only a technique for effective learning, but it is also a successful feedback mechanism for changing instructor behaviour. Prof. B.F Skinner's laboratory research are largely responsible for the introduction of programmed learning on the educational arena. The primary historical connections in the evolving chain of important events prior to Skinner are the concepts of "Conditioning" as articulated by Pavlov and Watson and the "Law of Effect" as formulated by Thorndike. Skinner's method of moulding behaviour was dubbed 'operant conditioning,' and it eventually became the foundation for programmed learning technology. It has now become a well-established instructional technology.

NEXT

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INTRODUCTION

NEXT

Overview

This is a Programmed learning material (PLM) based on the topic “WORK,ENERGY AND POWER” for 9th grade students. This is an interactive learning material wherein the learner is required to solve issues, make decisions, search for information, test assumptions, and take risks, rather than simply going through the motions and trying to absorb the information.

The first frame talks about work and the second frame deals with energy.The third and fourth frames are assigned to help the learner know more about the two major type of energies : Potential energy and Kinetic energy.The final frame gives the learner an insight into the concept of power.Each frame consists of the concept and a question in agreement with the concept.The learner is expected to first read through the concept,understand the concept and finally answer the question.Click on the answer you feel right.

Summer may be dimming, but remember that you are a lamp. Every new piece of knowledge makes you shine brighter and brighter to light up the world.Good luck for your learning experience!

NEXT

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LINEAR PROGRAMMED LEARNING MATERIAL

NEXT

FRAME 1 → FRAME 2 → FRAME 3 → FRAME 4 → FRAME 5

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INSTRUCTIONS

1. Each frame has a concept explained followed by a question in agreement to the concept.
2. The students are expected to choose the right answer to the Multiple Choice Questions with 4 options.
3. On giving the right answer,the student can move to the next frame

NEXT

FRAME 1

WORK

NEXT

Objects undergo displacement when a force is applied on them.For work to be done a force must be applied on the object and there must be a motion or displacement in the direction of the applied force.Work has magnitude alone and no direction.Hence work done is a scalar quantity.The formula for work done is ,

$$W = F.d = Fd\cos\theta$$

Where , F = force applied in Newton

d = displacement in metres

θ = angle between force and displacement

The unit of work is “Nm” or Joule .

Displacement is the shortest distance between the initial and final points

NEXT

Question : A railway potter, Arun ,is carrying a suitcase on his head and is walking forward.Another potter Rahul uses a trolley to carry the suitcase.He applied a force in the forward direction and the trolley moves forward.Which one of the following statements is correct?

1) Arun did more work

2) Rahul did more work

3) Both did not do any work

4) Both did the same amount of work

FRAME 2

ENERGY

NEXT

We need energy to do anything and everything.Energy is nothing but the ability do work.Since energy is found everywhere, there are different forms of energy like mechanical,nuclear,chemical,gravitational and heat to name a few.

All forms of energy are either kinetic energy or potential energy.

The law of conservation of energy is universal and is stated as follows :

"Energy can neither be created nor be destroyed.It can only be converted or transformed from one form to another.The unit of energy is "Joule".

Total energy = Kinetic energy + Potential energy

NEXT

Question: If the energy content of an object is 1000J and when checked later it is found to be 900J.What happened to the 100J energy?

1)The object transferred some of its energy to its surroundings.

2) Energy was destroyed.

3) The object absorbed additional energy from its surroundings.

4) Energy was created.

FRAME 3
POTENTIAL ENERGY

NEXT

An object can store energy by virtue of its position.For instance, a drawn bow stores energy as a result of its position.When it was in its original position (i.e. when not drawn) ,there is no energy stored in the bow.Yet

when its position is altered from its usual equilibrium position,the bow is able to

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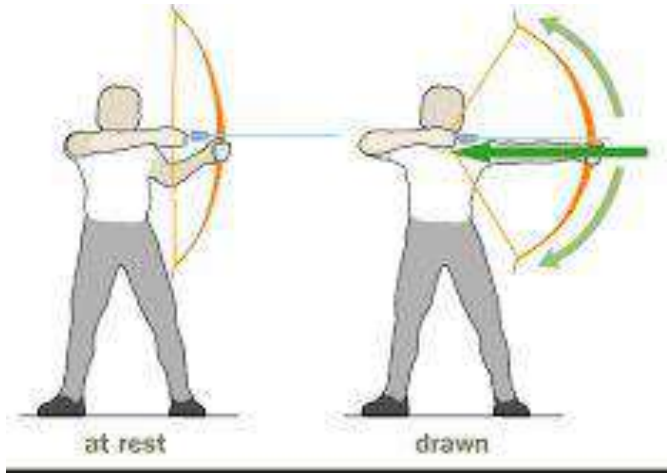

NEXT

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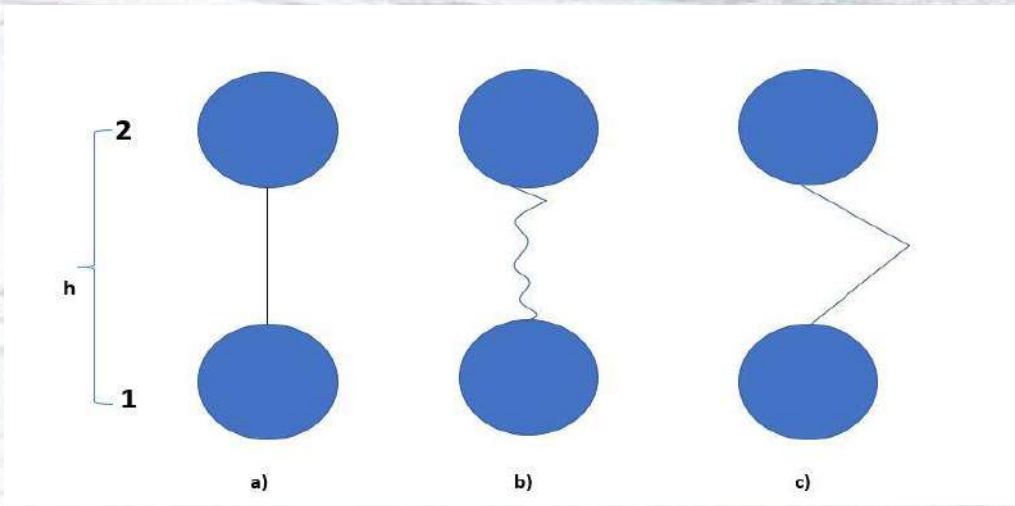

1) Potential energy is negative in b).
2) Potential energy is zero in a).
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FRAME 4
KINETIC ENERGY

NEXT

To accelerate an object,we need to apply a force and to apply a force we need to do some work.When work is done on an object energy is transferred to the object and the object moves with a new constant speed.We call the energy that is transferred, kinetic energy.In other words kinetic energy is the amount of work a body can do before coming to rest.

Kinetic energy is dependant on mass of the object and the speed achieved.It is given by the formula :

$$\text{Kinetic energy} = \frac{1}{2} m \times v^2$$

where,

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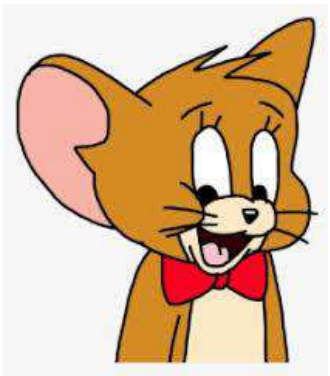

Anything in motion possess kinetic energy.

NEXT

Question: A cricket ball and a football have same kinetic energy.Which one of them
will move faster? (Hint: Cricket ball is lighter than football).

1. Cricket ball
2. Football
3. Both has equal speeds
4. Both remain stationary

FRAME 5
POWER

NEXT

Let us consider two weightlifters “A“and “B”.Both of them are lifting a mass of 100kg to a height of 2 metres.”A” finds it difficult to lift the weight at first and so he lifts the mass slowly, whereas “B” lifts it easily and fastly.’The work done in both the cases is

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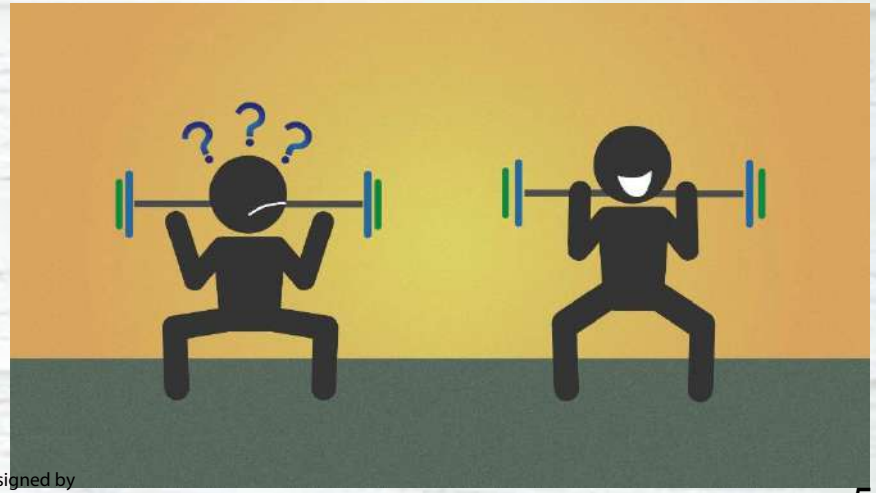
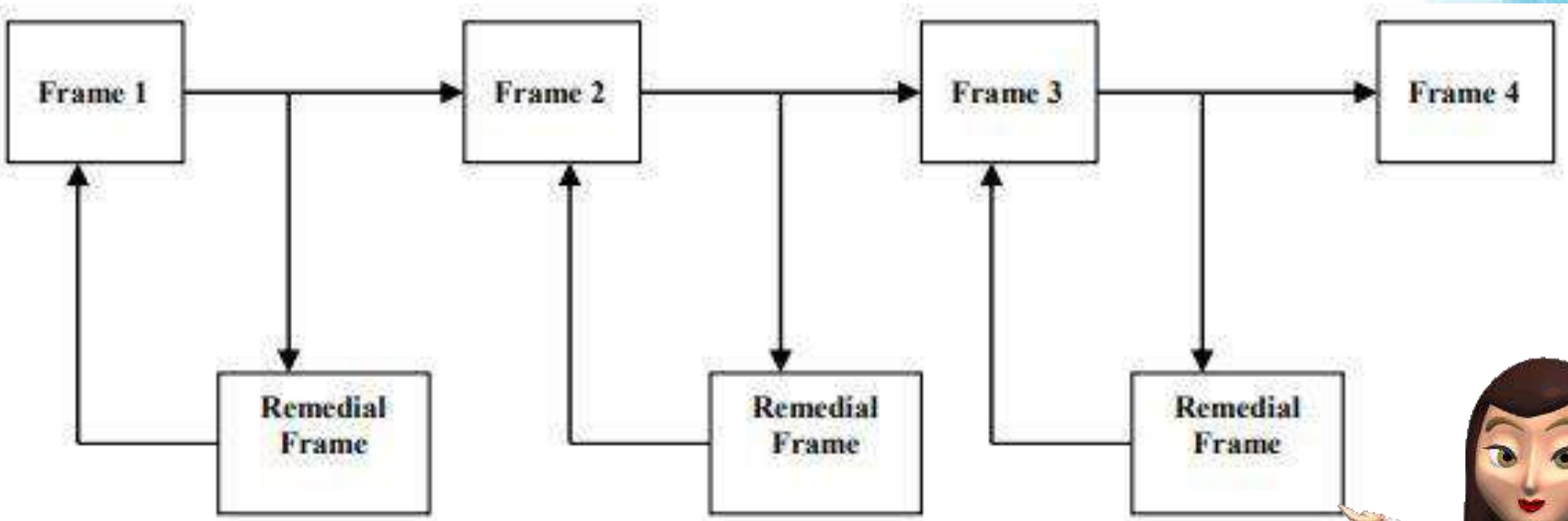
Question : Will and Ben are in the weightlifting room.Will lifts 100kg barbell over his head to a height of 1m ,10 times in one minute. Ben lifts 100kg barbell over his head 10times in 10 seconds again to the same height of 1m._____ did more work and _____ has more power.

1. Both did same amount of work, Ben.
2. Both did same amount of work, Will.
3. Ben,Ben.
4. Will,Ben.



BRANCHED PROGRAMMED LEARNING MATERIAL

NEXT


Frame 1
Frame 2
Frame 3
Frame 4
Remedial Frame
Remedial Frame
Remedial Frame

NEXT

Instructions

1. Each frame has concept described in it.
2. The frame is then followed by a question with 4 options,of which only one answer is right.
3. If the student selects the correct answer he can move on to the next frame.If the student selects wrong answer,he will be redirected to a remedial frame.
4. The student needs to click the teacher icon to get the explanation in the remedial frame.
5. The student will be reverted back to the initial frame from the remedial frame.
6. The student can proceed to next frame only after giving the right choice to the question in the previous frame.

NEXT

FRAME 1

WORK

NEXT

Objects undergo displacement when a force is applied on them.For work to be done a force must be applied on the object and there must be a motion or displacement in the direction of the applied force.Work has magnitude alone and no direction.Hence work done is a scalar quantity.The formula for work done is ,

$$W = F.d = Fd\cos\theta$$

Where , F = force applied in Newton

d = displacement in metres

θ = angle between force and displacement

The unit of work is “Nm” or Joule .

Displacement is the shortest distance between the initial and final points

NEXT

Question : A railway potter, Arun ,is carrying a suitcase on his head and is walking forward.Another potter Rahul uses a trolley to carry the suitcase.He applied a force in the forward direction and the trolley moves forward.Which one of the following statements is correct?

1) Arun did more work

2) Rahul did more work

3) Both did not do any work

4) Both did the same amount of work

FRAME 2

ENERGY

NEXT

We need energy to do anything and everything.Energy is nothing but the ability do work.Since energy is found everywhere, there are different forms of energy like mechanical,nuclear,chemical,gravitational and heat to name a few.

All forms of energy are either kinetic energy or potential energy.

The law of conservation of energy is universal and is stated as follows :

"Energy can neither be created nor be destroyed.It can only be converted or transformed from one form to another.The unit of energy is "Joule".

Total energy =
Kinetic energy +
Potential energy

NEXT

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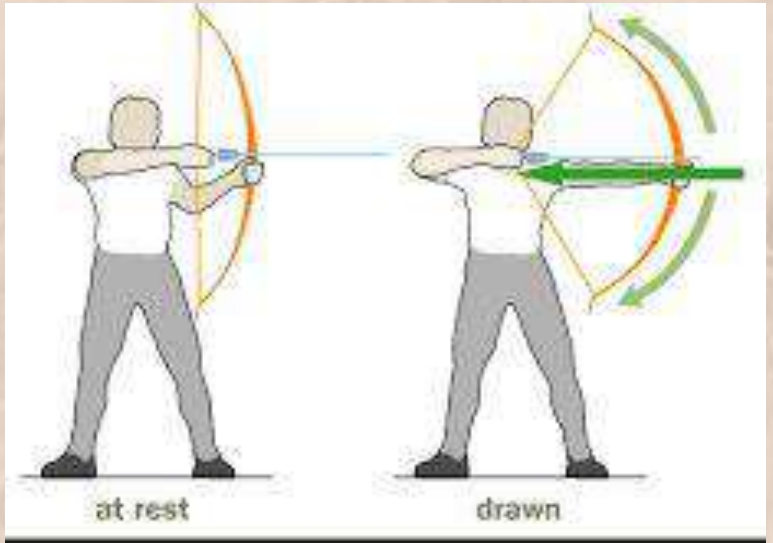

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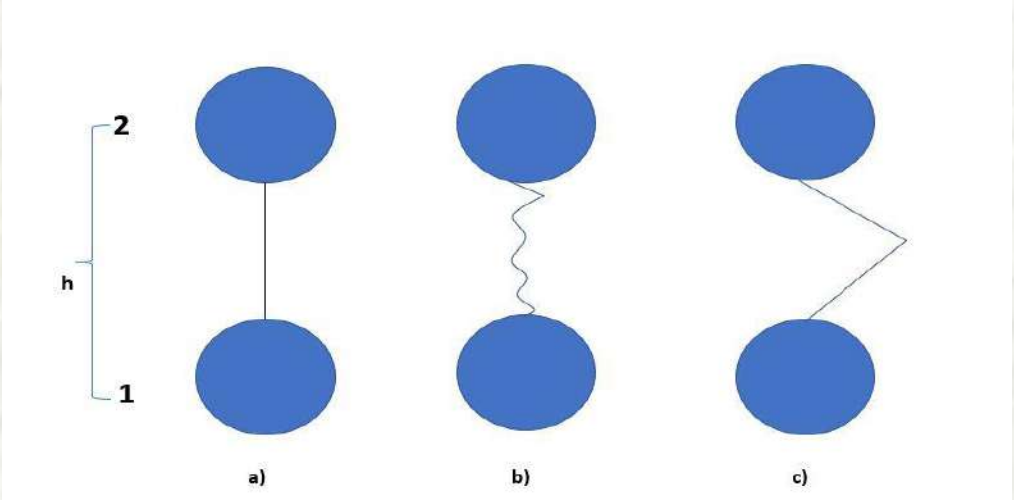

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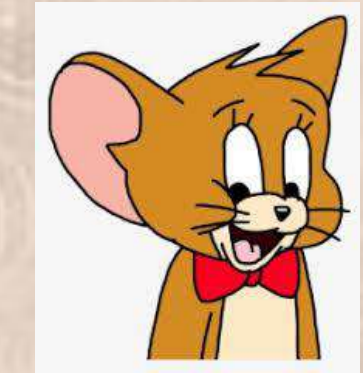

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POWER

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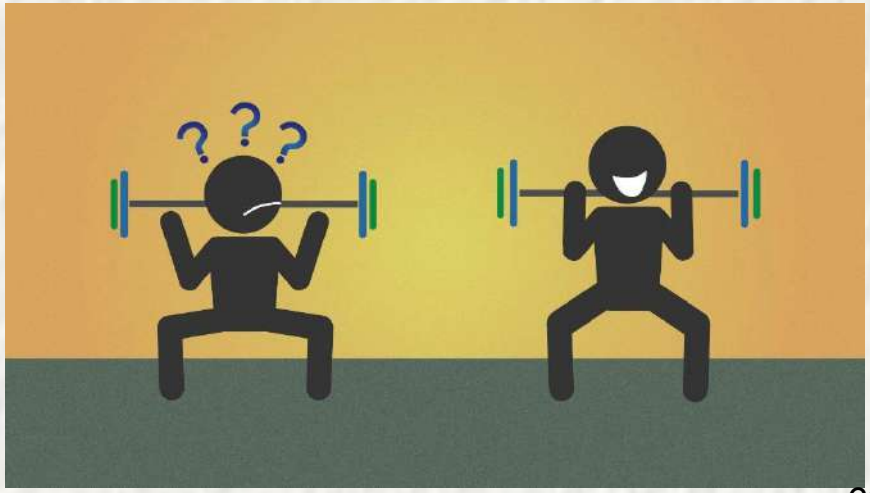


REMEDIAL FRAMES

HIP HIP HOOREYYY!!! YOU GOT IT RIGHT

Energy can neither be created nor be destroyed.It can be transferred so that total energy of the system remains unchanged

Go to frame 3

Your second part is right champ
But first part went wrong!

Work done depends only on the initial and final positions since it is stored as potential energy.Here Will and Ben ,both lifted the barbell to the same height

Go to frame 5

OOPS!
You have got it wrong

In both the cases ,the potter moves in the forward direction,but there is considerable difference in the way they are carrying the loads.Arun carried the load on head i.e. applies force upward whereas Rahul used the trolley i.e. he applied force in the forward direction.

Go to frame 1

SORRY…..YOU ANSWER IS NOT CORRECT

If the object absorbed additional energy from the surroundings,the energy would have increased from 1000J to 1100J.

Go to frame 2

Exactly champ!!
You are right.

Rahul pushed the trolley in the forward direction and the displacement is also in the forward direction.

Go to frame 2

SORRY..
YOU ARE
WRONG

Potential energy is dependant on mass,acceleration due to gravity and height to which the object is raised.Height and mass can never be negative.Also “g” is a constant.

Go to frame 3

OOPS!
YOU ARE
WRONG

Energy can never be created.The total energy of the system always remains a constant.

Go to frame 2

OOPS!!
YOU ARE WRONG THIS TIME

Potential energy depends only on the initial and final position of the object.

Go to frame 3

NO..YOU HAVE GOT IT WRONG DEAR

Energy can neither be created nor be destroyed. Energy can only be transformed from one form to another.

Go to frame 2

OH DEAR.. YOU ARE WRONG

Potential energy is zero only if the object has not moved from the reference point.Here it moved to a height “h” against gravity

Go to frame 3

YES Ben has more power.But Will did not do more work

Work done depends only on the initial and final positions since it is stored as potential energy.Here Will and Ben ,bith lifted the barbell to the same height

Go to frame 5

NAILED IT!!!
YOU ARE RIGHT

Potential energy depends only on the initial and final positions.In all the three cases ,the object is raised to the same height “h”

Go to frame 4

I am impressed champ…you are right

Cricket ball is lighter than football .So as mass decreases speed must increase to maintain equal kinetic energies.

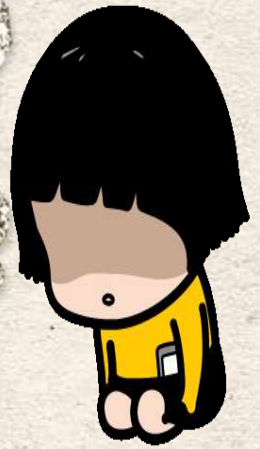
Go to frame 5

Sorry you are wrong

Arun did not do any work as force is perpendicular to displacement.But Rahul did work as force and displacement is in same direction

Go to frame 1

Oh No!!
It’s wrong dear



Football is heavier than cricket ball.To maintain equal kinetic energies the speed of football should be less when compared with cricket ball

Go to frame 4

Partially right! Indeed both did the same amount of work.But is power the same for both?

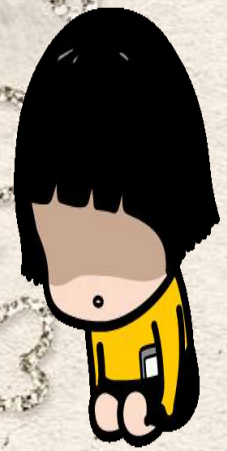
No!Power is not the same for both Ben and Will since they took different amount of time.Power is given by ,

$$P=\frac{\text{WORK DONE}}{\text{TIME}}$$

i.e. Power is inversely proportional to time.

Go to frame 5

OH NO!
INCORRECT
RESPONSE



Potter Arun is carrying a heavy load on his head and is moving forward i.e. he is applying a force in the upward direction but moves forward.We say work is done when displacement is along the direction of applied force.

Go to frame 1

SORRY YOU ARE WRONG!

Kinetic energy is the energy possessed by moving objects alone and not stationary objects

Go to frame 4

Correct
Correct
Correct

Work done is stored here as potential energy.Work done,
W= m×g×h = 100kg×9.8×1m
=980J

Work done is same in both case as mass and height is constant in both cases.

Power = $\frac{\text{Work done}}{\text{Time}}$

For Ben , P = $\frac{980J}{10S}$ = 98 Watts

For Will,P = $\frac{980J}{60S}$ =16.33Watts

So Ben has more power

CLICK ME…YOU ARE DONE

WHOOPS!!!
IT'S WRONG

Same kinetic energy does not imply the velocities are the same.Kinetic energy depends not only on velocity but also mass.

Frame 4 option 3

Go to frame 4

THANK YOU...

ALICE JOSEPH

Digitally signed by ALICE JOSEPH
Date: 2024.02.02 19:40:27 +05'30'