

Work And Energy

Subject: Science

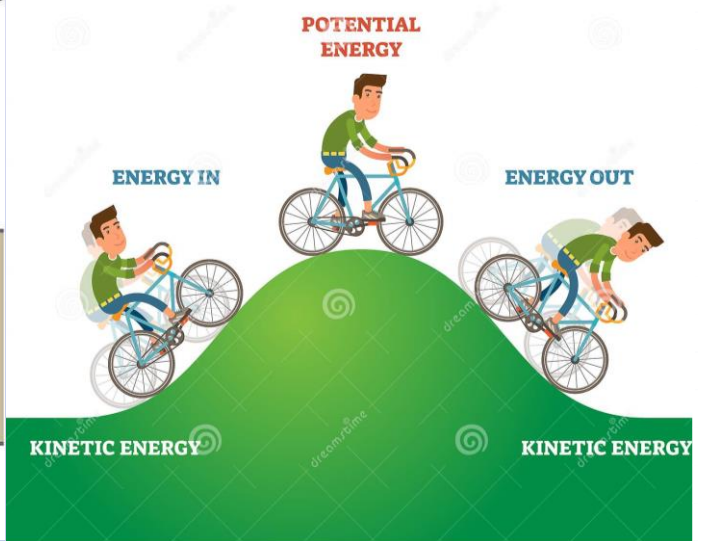
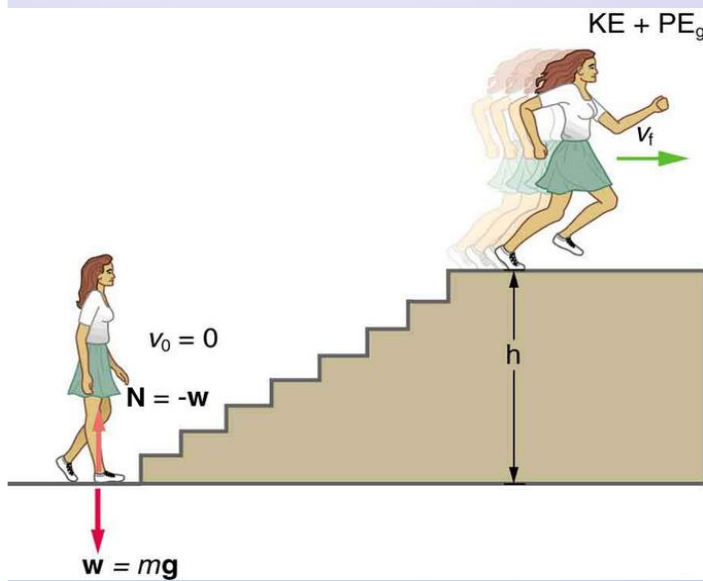
Class - IX



0964CH11



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ST. ANSELM'S PINK CITY SCHOOL
MALVIYA NAGAR,

Affiliated to C.B.S.E.

ACKNOWLEDGEMENT

CBSE has always aspired to integrate technology with regular curriculum along with making every effort to make it interesting for the students. One such initiative is the concept of 'GRAPHIC NOVEL'.

An amazing group of teachers and educationists of St. Anselm's Pink City School, Malviya Nagar, Jaipur, teamed up under the able guidance and support of CBSE to present this graphic novel on '**WORK AND ENERGY**' (Class 9, SCIENCE)

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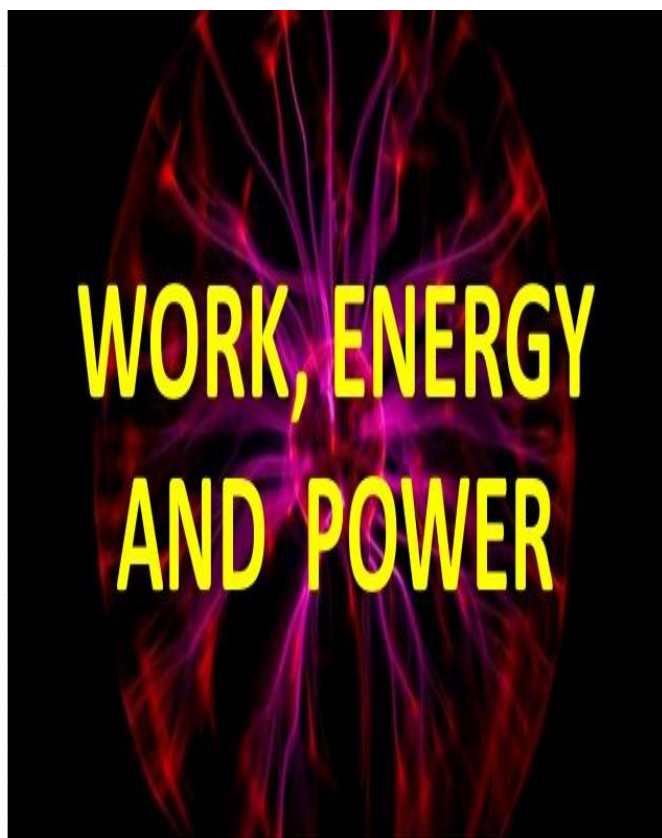
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PREFACE



This Graphic Novel engages students in understanding the basic concepts of Work and Energy.

The content in the novel covers in detail the topics relating to types of energy, definitions, energy conservation and conversion and power etcetera and therefore make the students develop an

understanding of the same.

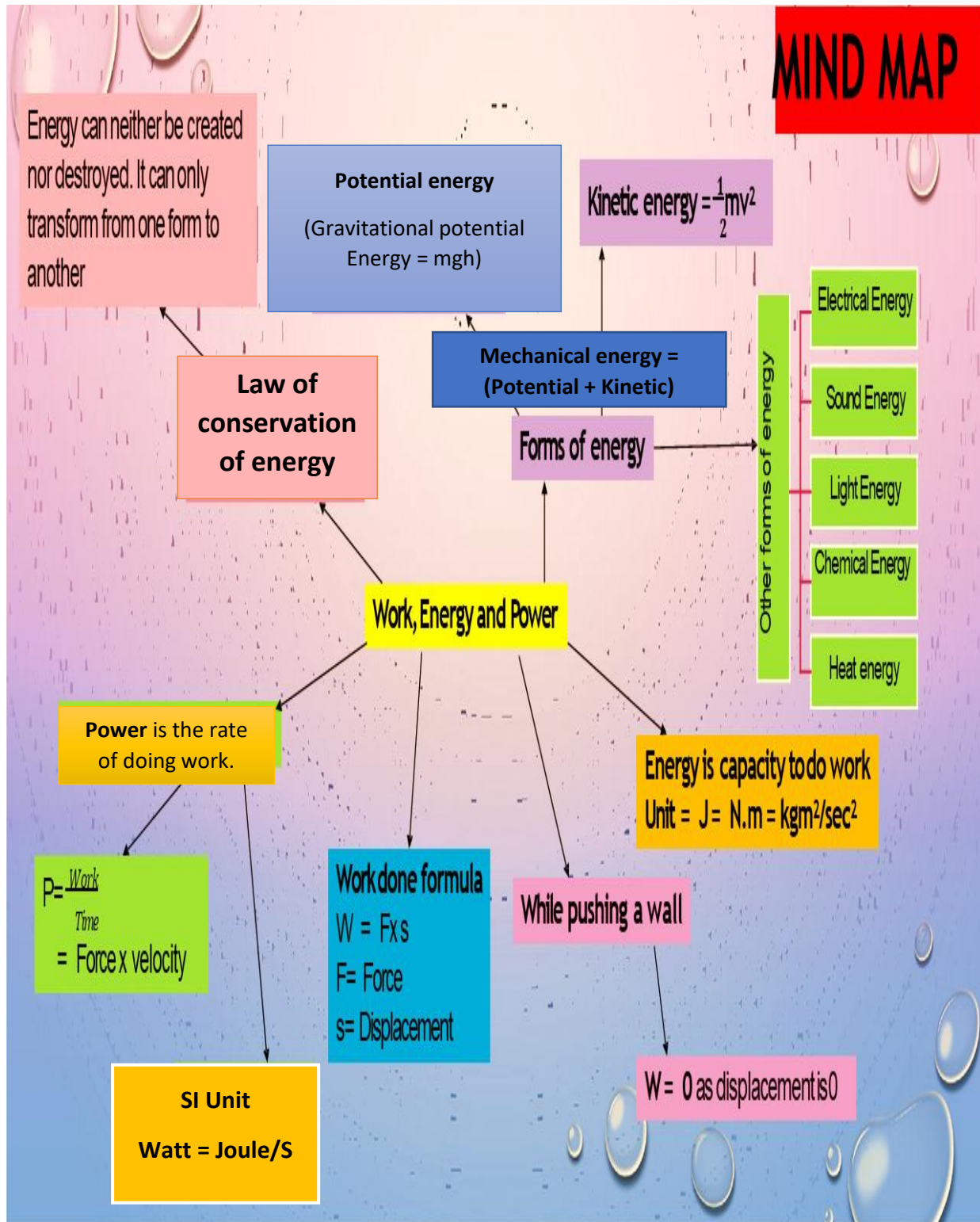
It further highlights the scientific concept of 'work', force used in 'work', forms of energy, commercial unit of energy and engages students through the medium of exercises such as jumbled words, fill in the blanks and the like.

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-.DISCLAIMER:-All the names, characters, events and incidents in the book are either the products of the author's imagination or used in a fictitious manner. Any resemblance to actual persons living or dead or actual events are purely coincidental. Every effort has been made to ensure that the information in this book regarding concepts of work and energy are based on the NCERT class 9 textbook of science. The authors and publishers hereby disclaim any liability caused by human errors. This presentation is for educational purposes only so as to make a better understanding of the concept.

MIND-MAP



CHARACTERS

Mrs. Sampson



She is the Science teacher. She is very intelligent, talented and popular amongst her students

Mr. Sharma
(Shaurya's Father)



He is Shaurya's father, who is intelligent, knowledgeable and jolly natured. He mixes with children easily.

STUDENTS



Naveen

He is a student who is little unkempt. He is a mediocre student and curious boy who wants to know every new thing



Sahil

He is mediocre student and a hyperactive boy who wants to do every new thing...



Nipun

He is a fat chubby boy but at the same time very energetic and active.

He is an intelligent, mischievous and loves teasing others. He is also very funny.



Shaurya

LEARNING OBJECTIVES

NCERT CHAPTER	LEARNING OBJECTIVE	LEARNING OUTCOMES
Ch 11	#To access situations and identify where work is done on the basis of the definition of work in physics and science.	#In all situations to be able to justify work done according to definition in physics.
WORK AND ENERGY	#Be able to Comprehend energy and energy is ability to do work, hence energy is the work done on/by the object.	#Be able to calculate power and electrical energy consumption in households. Be able to identify different types of energy and relate it to the agency doing the work.
	# Generalise the law of conservation of energy to situations of energy transfer and calculate the total energy of an object	#To be able to critically analyse the situation where work is not being done yet energy is spent.
	# Comprehend energy transfer and write an expression for the kinetic energy of an object	#Derives formula of kinetic energy and gravitational potential energy.
	# Relate kinetic energy to mass and speed of the object and calculate kinetic energy possessed by the objects # Relate potential energy to position and calculate gravitational potential energy possessed by the object	#Prove Law of Conservation of energy with the help of numerical values. #Be able to understand the kinetic energy depends on speed and not velocity.
	# calculate power and assess the efficiency of work done	#Conduct investigation to calculate 'units' consumed per month and compare with electricity bill
	# Get conversant with commercial unit of energy and calculate total energy consumption and determine total cost in households and industries	#Convert commercial unit in SI unit .

Day in School-Teacher enters in class IX and children start shouting.

Good Afternoon children.

Good Afternoon Ma'am.

Good Afternoon Ma'am.

B-01

Ma'am, please gives us a free period.

Please Ma'am gives us a free period as SSt Ma'am has taught us for 2 periods.

Yes, Ma'am please.

B-02

Everyone started requesting for a free period.

But, you are all sitting in the class. How can you say that you have been doing work and you are tired? Scientifically all of you have not done any work.



B-03

Any way, Let us go to the playground

Yay, Thank you so much Ma'am.



B-04

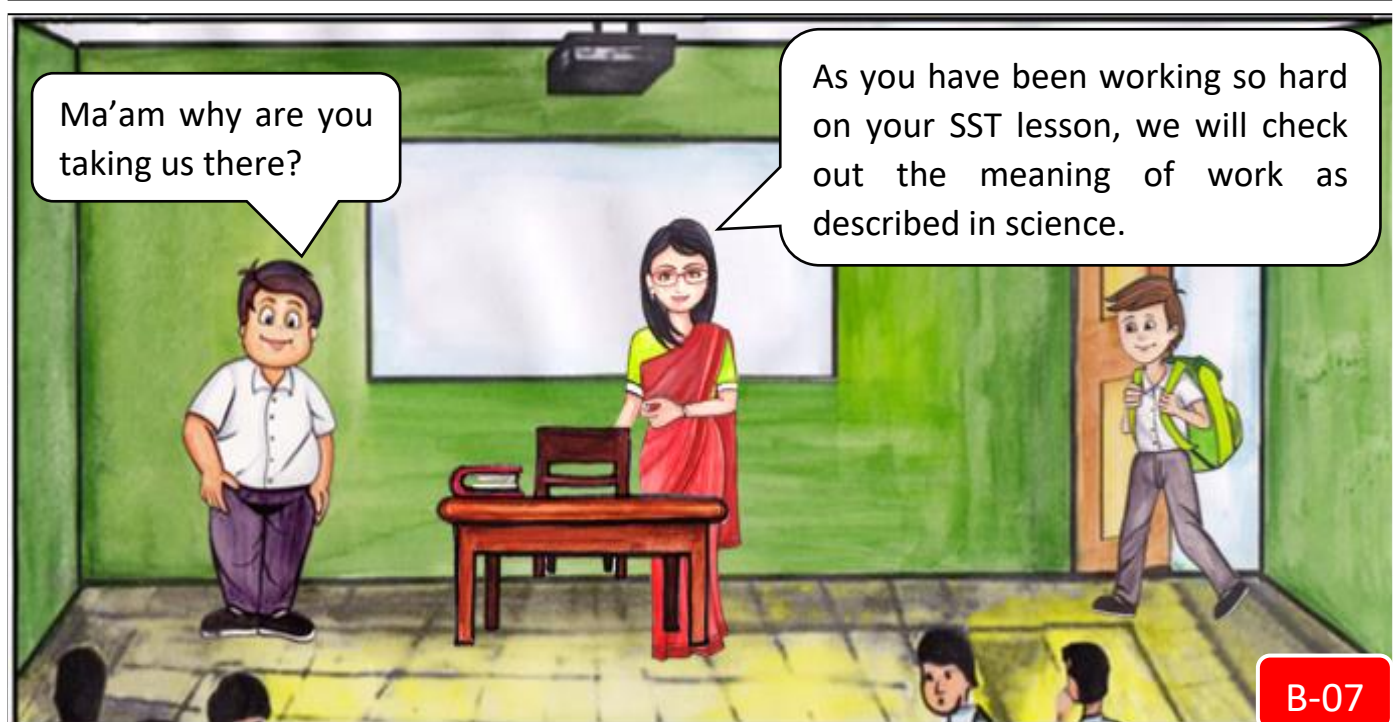
Children started shouting with excitement.

Yes, thank you so Much Ma'am.

Thank you. Ma'am.



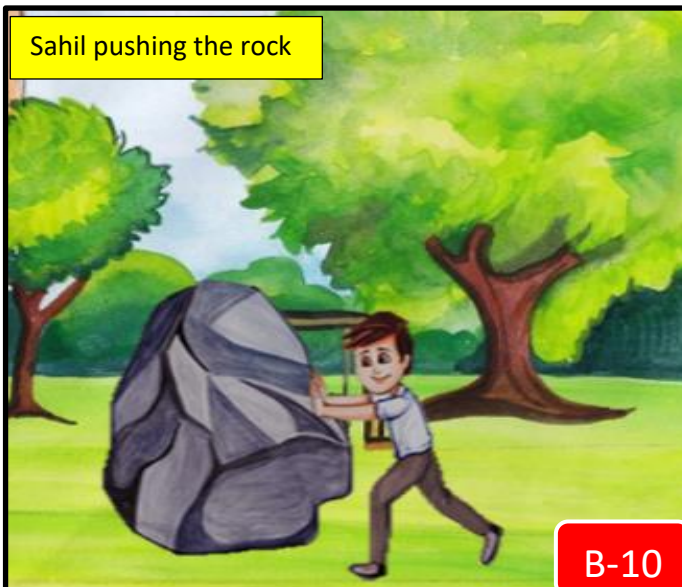
B-05



Now we all will experience the situations when the work is done and when it is not. Now Sahil go and push that rock and move it.



Sahil pushing the rock



Ugh! Oh. It is very heavy.



Ma'am, that rock is very heavy and I could not push it. I'm tired as I pushed it for 5 minutes and now, I am feeling hungry.



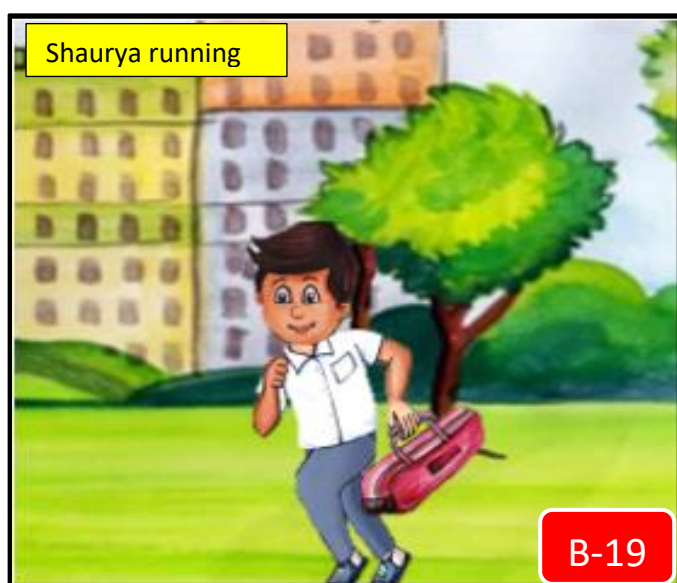
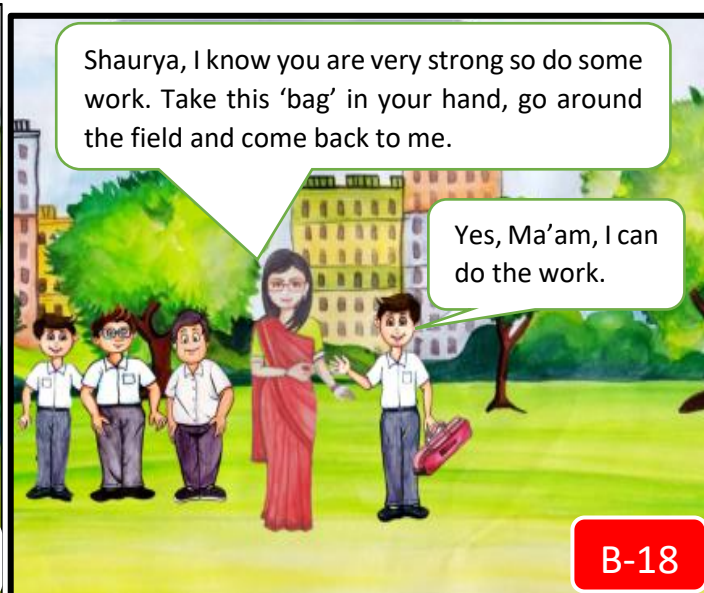
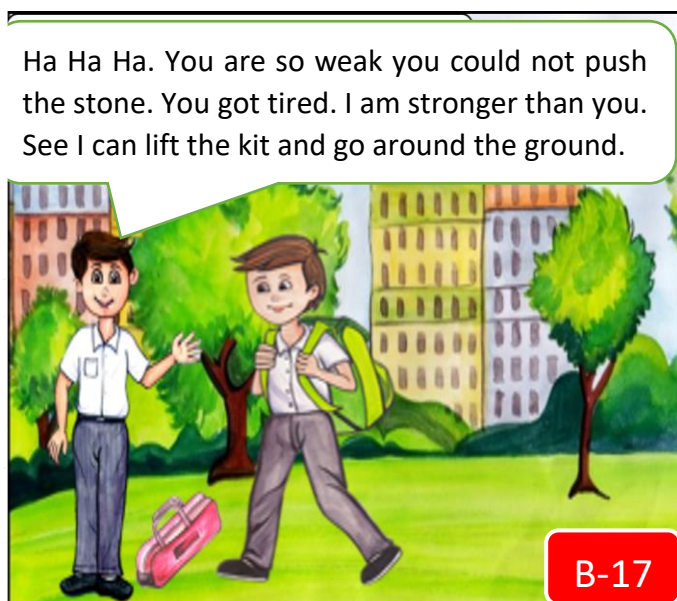
But you have done no work even though you applied force, there was no displacement.

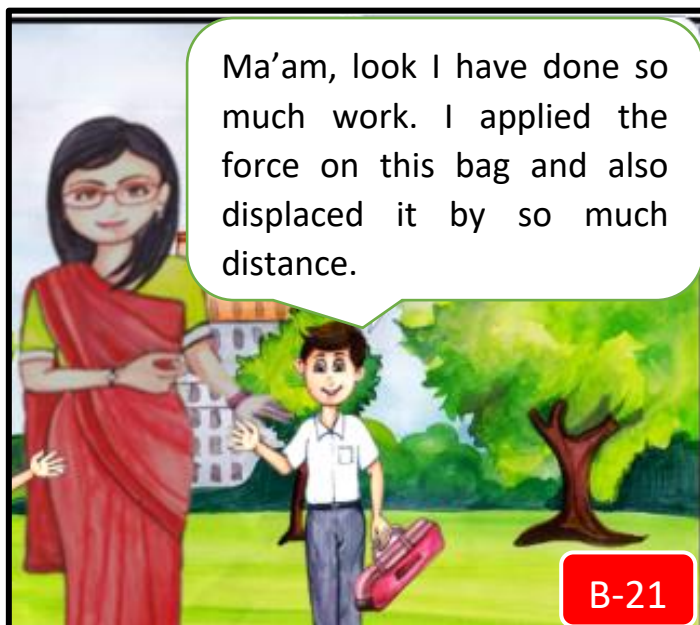
Ma'am, If I did not do work then why has my energy depleted and I am tired?



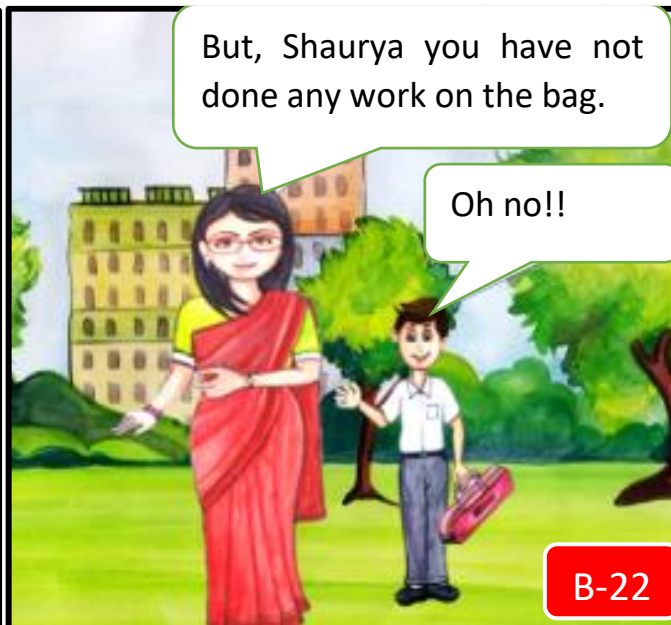
Sahil, you have not done work on the rock but, work is done on your body. As the rock was not displaced, so no work was done.



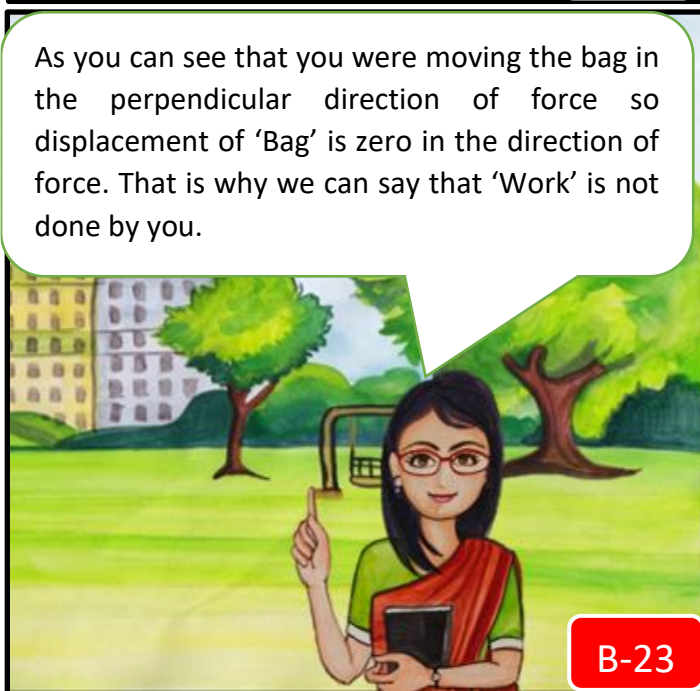




B-21



B-22



B-23



B-24

Work is said to be done if the force acting on an object causes are displacement in it. But if the direction of applied force and the direction of displacement are perpendicular to each other, no work is done. It can be calculated by $W = Fs$. F is force and s is displacement in the direction of force. S.I unit of work is Joule.



Carrying



Running



Cycling



Lifting



Driving



Flying



Resting



Pushing

B-25

WORKSHEET I

I. MULTIPLE CHOICE QUESTIONS

1. A man is carrying heavy luggage from one platform to another at a railway station but still according to the logic of science his work done is said to be zero. Can you choose the correct reason?

- (a) The force is acting along the direction of displacement of luggage
- (b) The force is acting perpendicular to the direction of displacement of luggage
- (c) The force is acting opposite to the direction of displacement of luggage
- (d) The force on the luggage by the man is upward and the weight is acting downwards so force is cancel.

2. When a body like moon is moves in a circular path around the earth due to gravitational force but the work done is zero because gravitational force by the earth is:

- (a) in the direction of motion of the body
- (b) along the radius of circular path
- (c) along the tangent of circular path
- (d) perpendicular to the radius of circular path

3. The work done on an object does not depend upon the:

- (a) Angle between force and displacement
- (b) Force applied
- (c) Initial velocity of the object
- (d) Displacement

II. TRUE AND FALSE:

1. When the body is dragged along a rough surface plane, the work done by us on the body is negative.
2. In watching a movie maximum work is done.
3. Work is done when force acts on the body and body is displaced in the direction of force.
4. A Runner, while moving, is facing the wind from the opposite direction. The work done by the wind on runner will be negative.

III.FILL IN BLANKS:

- 1 The work done is said to be ----- when force and displacement are acting perpendicular to each other.
2. SI unit of Work is -----
- 3.Work done by a man pushing a rigid wall is -----

IV. JUMBLED WORDS:-

1. ROKW
2. UOLEJ
3. ERFOC

ANSWER KEY

I MCQ:-

- 1 (b)
- 2.(b)
- 3.(c)

II TRUE & FALSE-

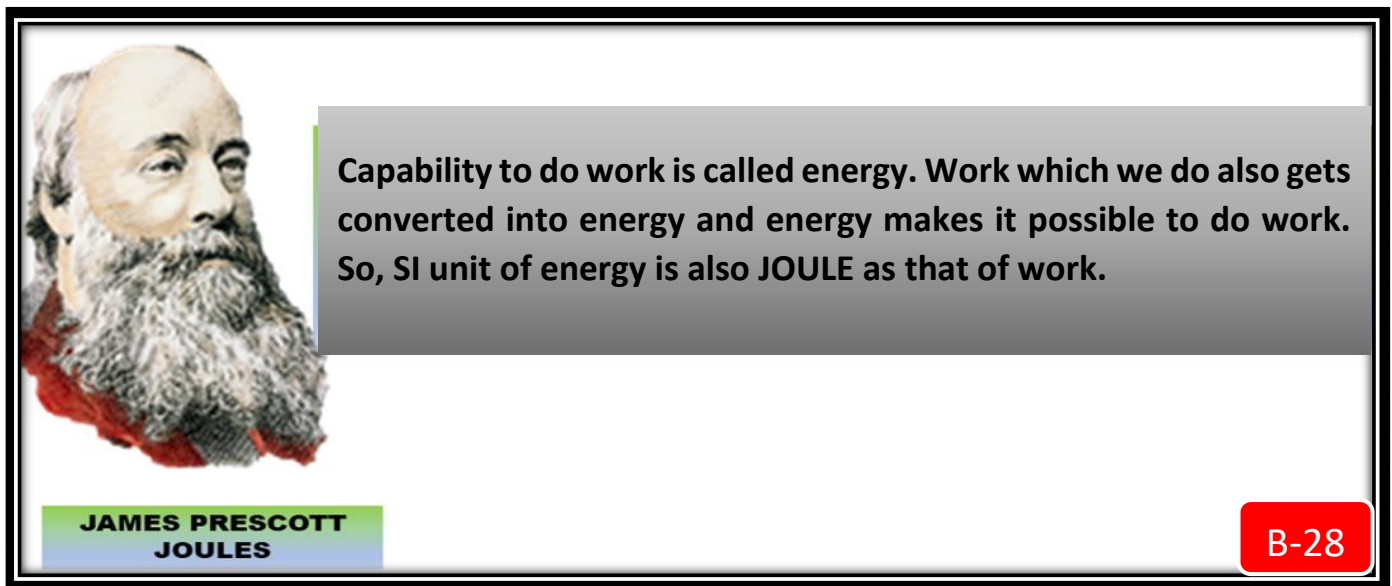
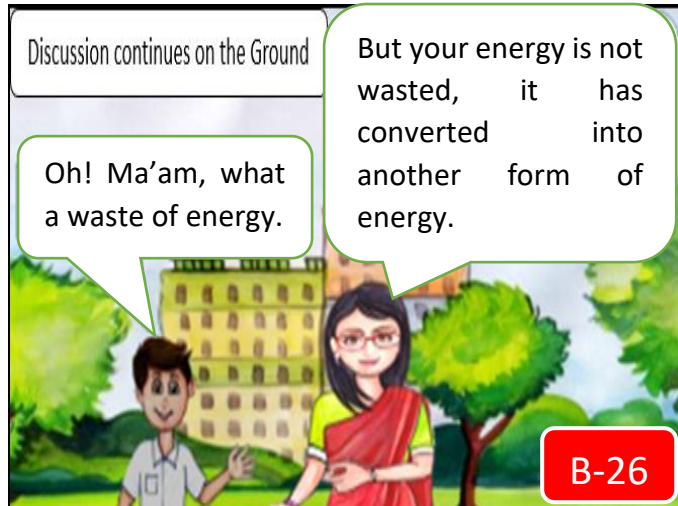
- 1 FALSE
- 2 FALSE
- 3 TRUE
- 4 TRUE

III FILL IN THE BLANKS-

- 1 . Zero
- 2 . joules
- 3 . Zero

IV JUMBLED WORDS-

- 1 WORK
- 2 JOULE
- 3 FORCE

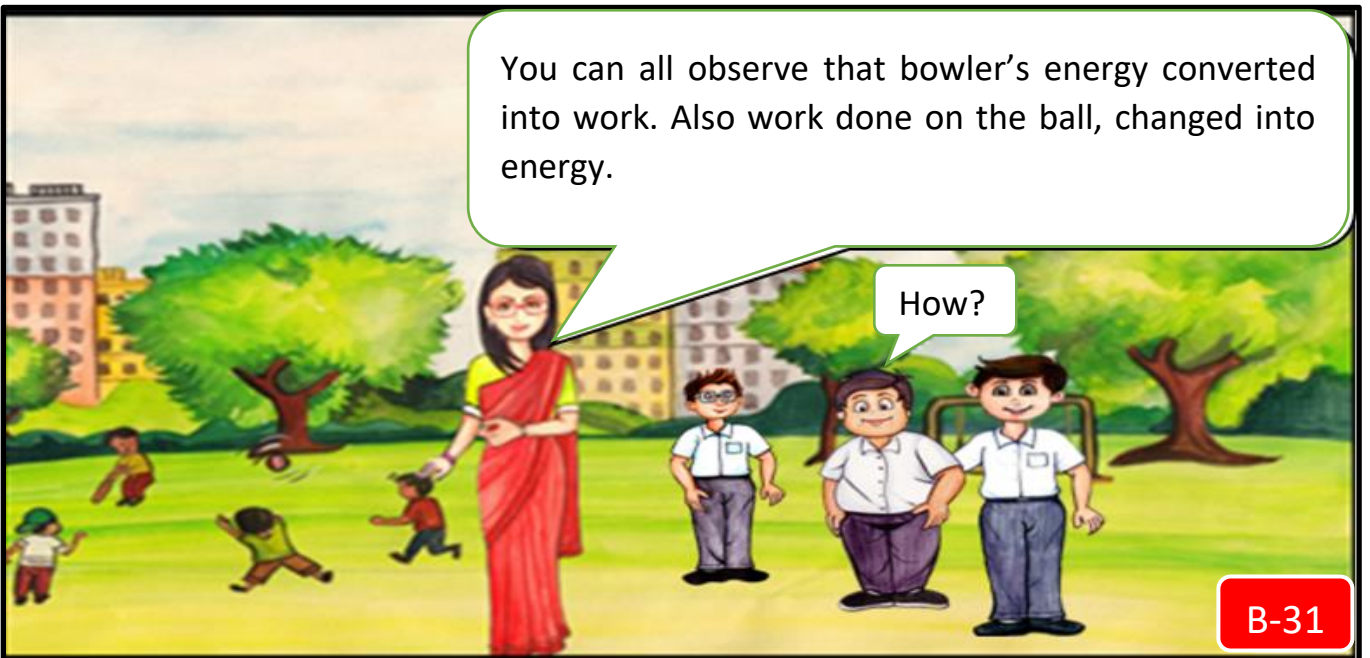


Children shout with joy and put the wicket down and start playing. Batsman gets ready and wait for the bowler to bowl the ball. Bowler throws the ball and the batsman hits it, then one fielder catches it.



B-30

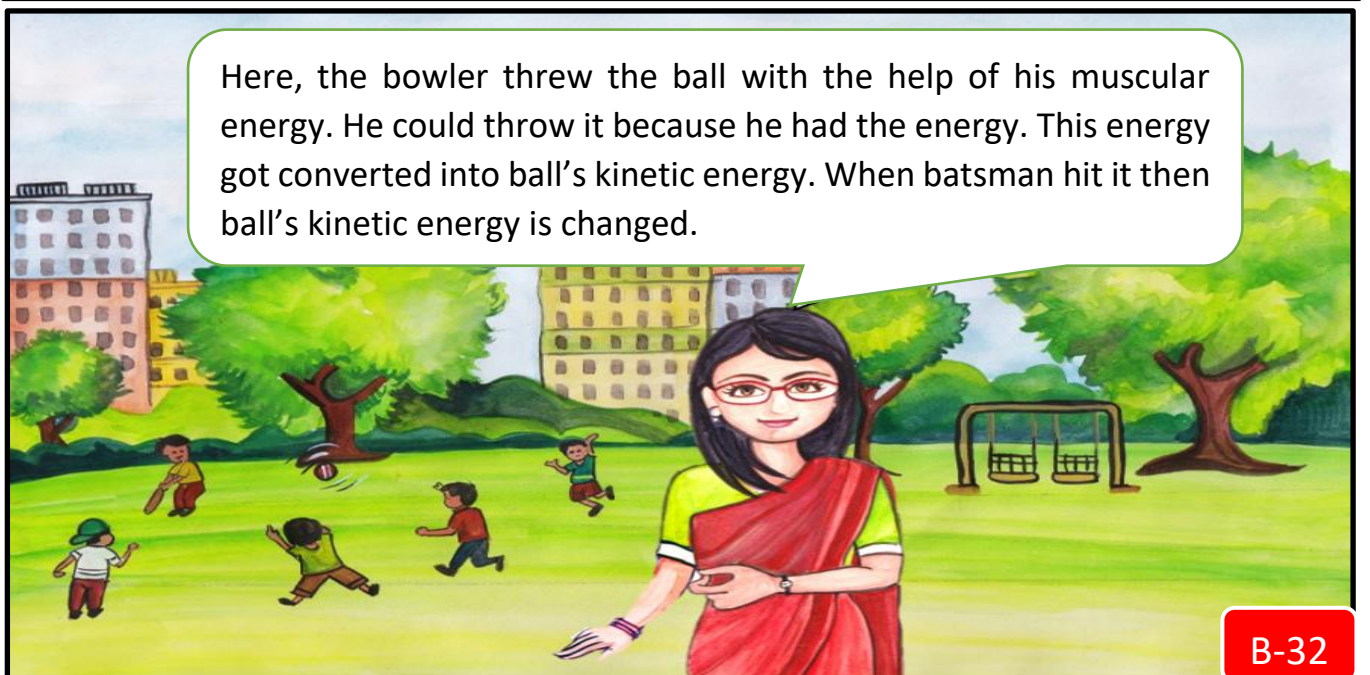
You can all observe that bowler's energy converted into work. Also work done on the ball, changed into energy.



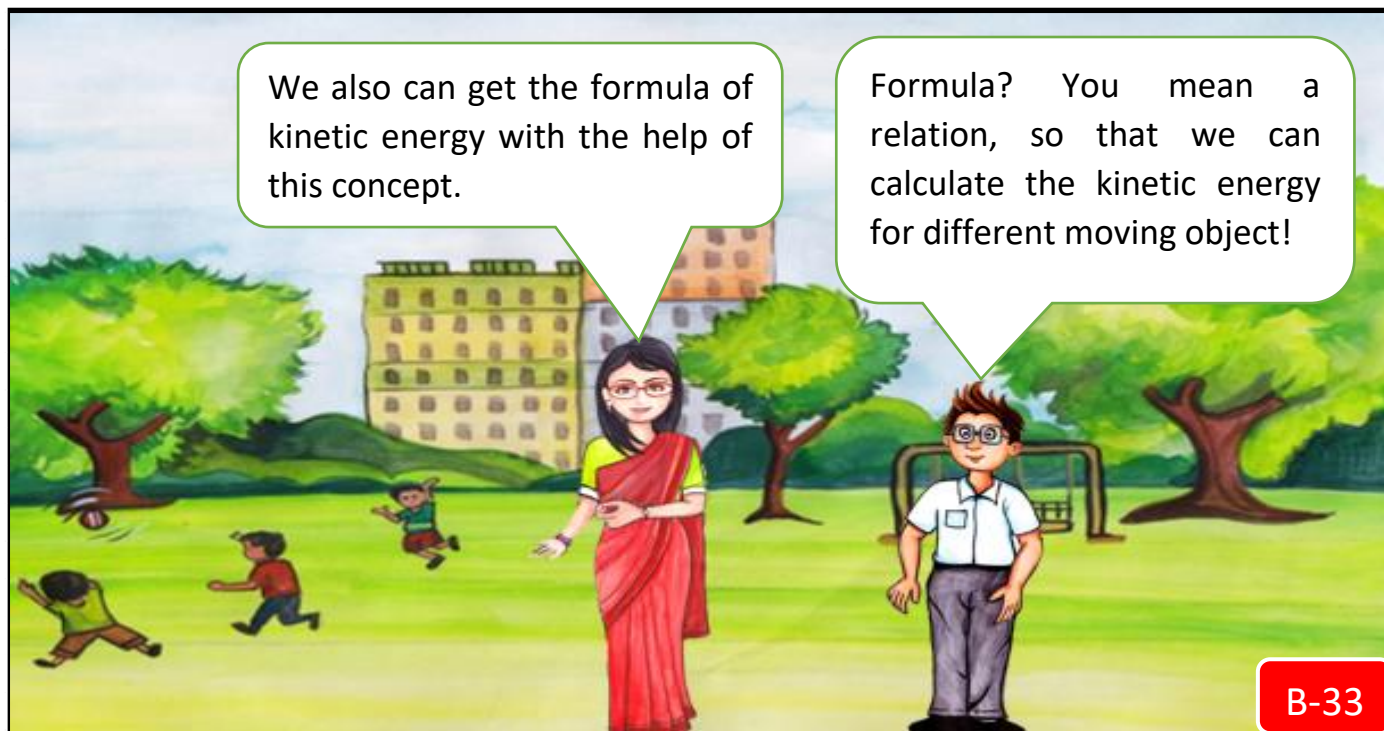
How?

B-31

Here, the bowler threw the ball with the help of his muscular energy. He could throw it because he had the energy. This energy got converted into ball's kinetic energy. When batsman hit it then ball's kinetic energy is changed.



B-32



As we know that work done on any object of mass m , changes its kinetic energy so they are related. If by applying force F on this ball, its velocity changes from u to v after covering the distance s then work done will be

$$W = F \cdot s$$

By applying Newton's second law of motion and III equation of motion.

$$W = ma \cdot \frac{v^2 - u^2}{2a}$$

this gives us

$$\therefore W = \frac{1}{2}m(v^2 - u^2)$$

But this shows that work done is equal to change in the kinetic energy

$$\therefore E_k = \frac{1}{2}m(v^2 - u^2)$$

If object moves with uniform velocity then kinetic energy

$$E_k = \frac{1}{2}mv^2$$

B-34

Kinetic Energy

Kinetic energy is the energy that objects possess due to their motion.

$$KE = \frac{1}{2}mv^2$$

m = mass (kg)

v = velocity (m/s)

KE = Kinetic energy (J)

B-35



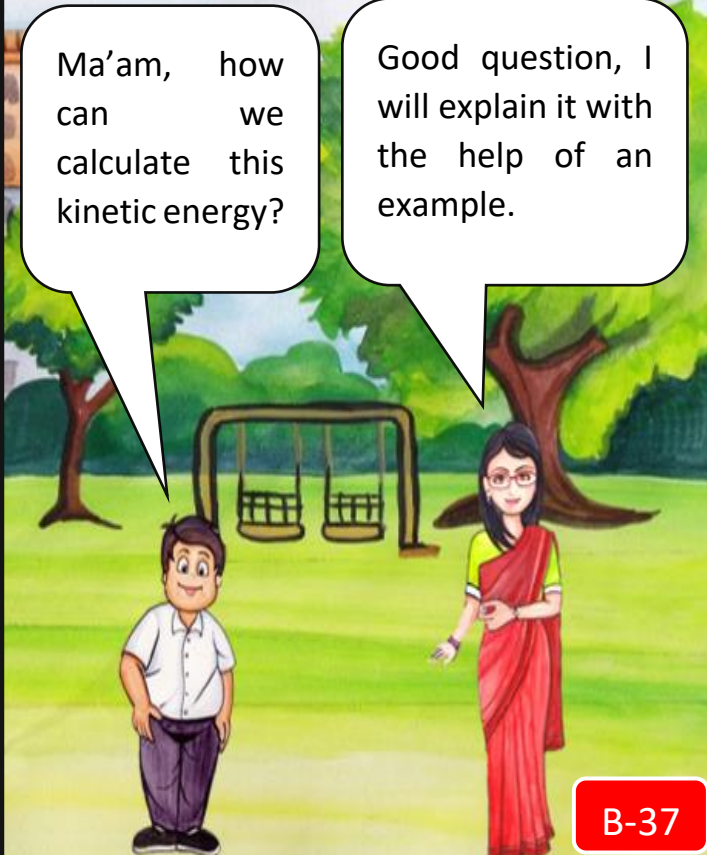
Kinetic energy
energy of a moving object.



B-36

Ma'am, how can we calculate this kinetic energy?

Good question, I will explain it with the help of an example.



B-37



Suppose you throw a ball of 100 gm with a velocity of 25 m/s. Now to calculate its kinetic energy we use the formula of kinetic energy and put the values in it. But we change the mass in kg to get work in S.I unit.

$$\therefore m = \frac{100}{1000} \text{ kg} = \frac{1}{10} \text{ kg}$$

$$E_k = \frac{1}{2}mv^2$$

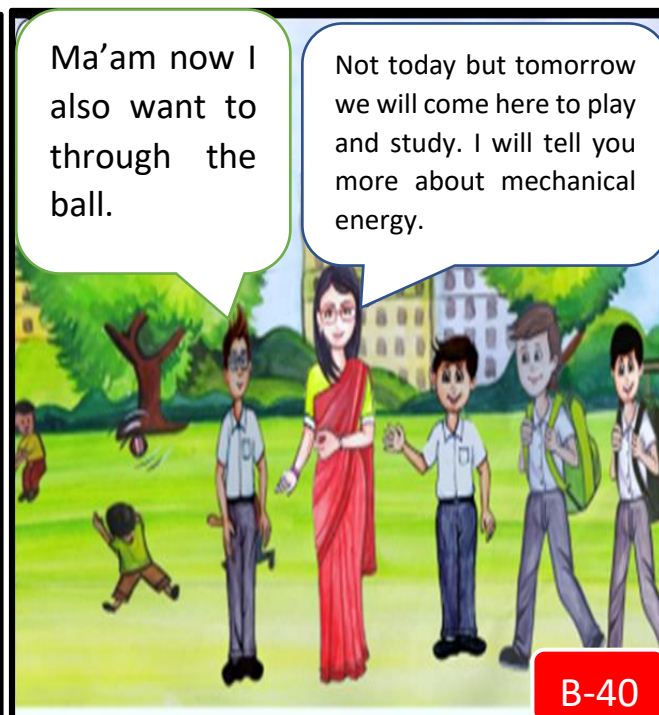
$$= \frac{1}{2} \times \frac{1}{10} \times (25)^2$$

$$= \frac{625}{20} = 31.25 \text{ J}$$

B-38



B-39



B-40

WORKSHEET II

I. MULTIPLE CHOICE QUESTIONS

1. The kinetic energy is possessed by:

- (a) Crow sitting on a branch
- (b) Train standing on a platform
- (c) Flying bird
- (d) Book kept on a shelf

2. A car is accelerated on a leveled road and attains a velocity 4 times of its initial velocity.

In this process, the kinetic energy of the car

- (a) Becomes twice to that of the initial
- (b) Becomes four times to that of the initial
- (c) Remains the same
- (d) Becomes 16 times to that of the initial

3. The velocity of a bullet of mass 50 g fired from a gun is 10 m/s. The kinetic energy of this bullet in J will be

- (a) 25
- (b) 2.5
- (c) 0.25
- (d) 25

II. FILL IN THE BLANKS:-

1. ----- is the capacity to do work.
2. Doubling ----- will have more impact on kinetic energy.
3. The energy for life processes comes from -----.

III. TRUE OR FALSE:-

1. A flying Aeroplane possesses kinetic energy.
2. A rolling stone does not possessed kinetic energy.
3. Out of a light and a heavy body having equal kinetic energy, heavy body will move faster.
4. Kinetic energy can not be negative.

IV. MATCH THE FOLLOWING:-

Column1	Column2
1.WORK	1. $\frac{1}{2} mv^2$
2. kinetic Energy	2. mgh
3.gravitational potential energy	3. F.s

V. JUMBLED WORDS:-

1. TENPIAOLT ERNEGY
2. RAGTIVY
3. TIELOVCY

ANSWER KEY

I MCQ:- 1 . (c) 2 (d) 3. (b)	II FILL IN THE BLANKS- 1 Energy 2 Velocity 3 Food
III TRUE OR FALSE- 1 True 2 False 3 False 4 True	IV MATCH THE FOLLOWING:- COLUMN 1 COLUMN 2 1----- 3 2-----1 3-----2
V JUMBLED WORDS- 1 POTENTIAL ENERGY 2 GRAVITY 3 VELOCITY	

NEXT DAY ON GROUND

Now you see that your ball has stopped, so where did its energy go?

Hey!! Out

B-41

Ma'am, is the energy of ball destroyed?

No, this energy has done the work on the wicket and the potential energy of the wicket has changed. Also, some of the ball's energy has changed into heat and sound energy.

B-42

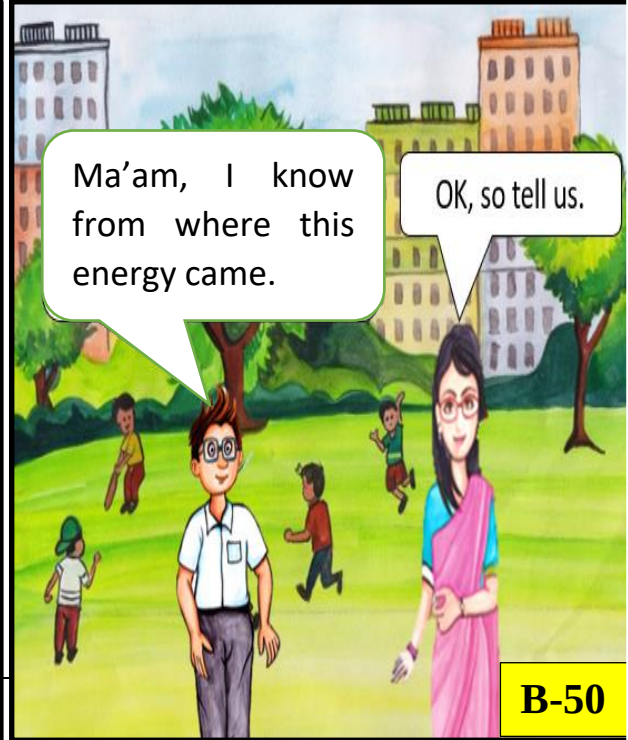
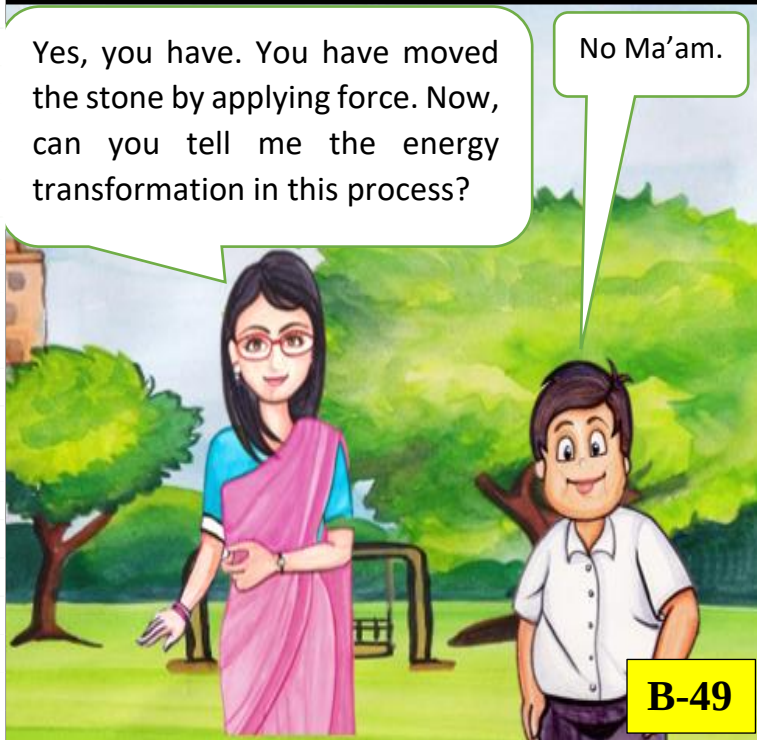
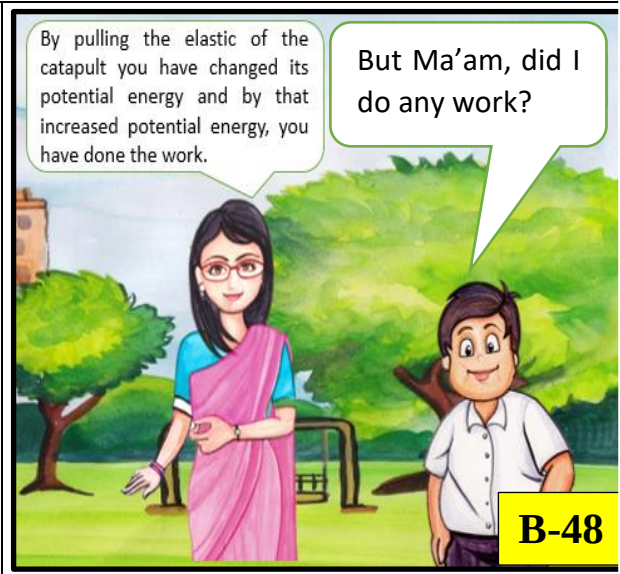
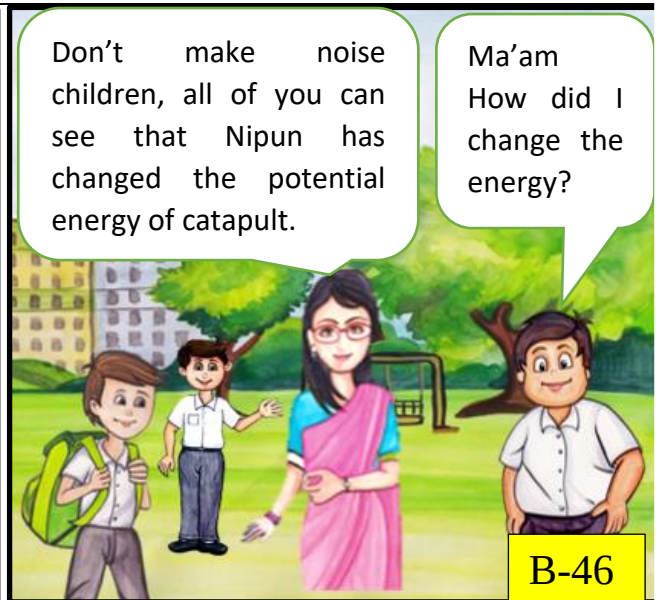
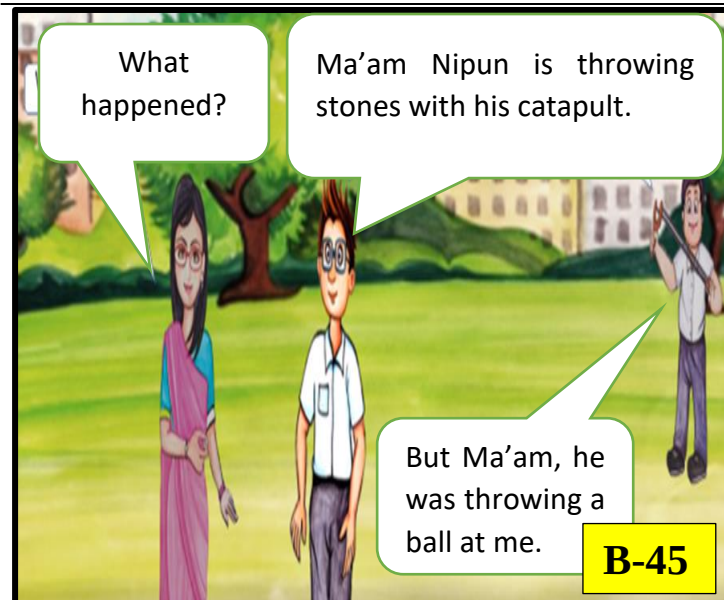
But Ma'am, the wicket has fallen on the ground.

Yes, when the position or Configuration of anything changes then we say that its potential energy has changed.

B-43

Children running

B-44



Ma'am, it came from Nipun's muscular energy. He eats a lot of food and sometime eats our tiffins also. So, he has more muscular energy, he used this energy to do the work.



B-51

His muscular energy changed the potential energy of catapult and that potential energy has changed into kinetic energy of stone.

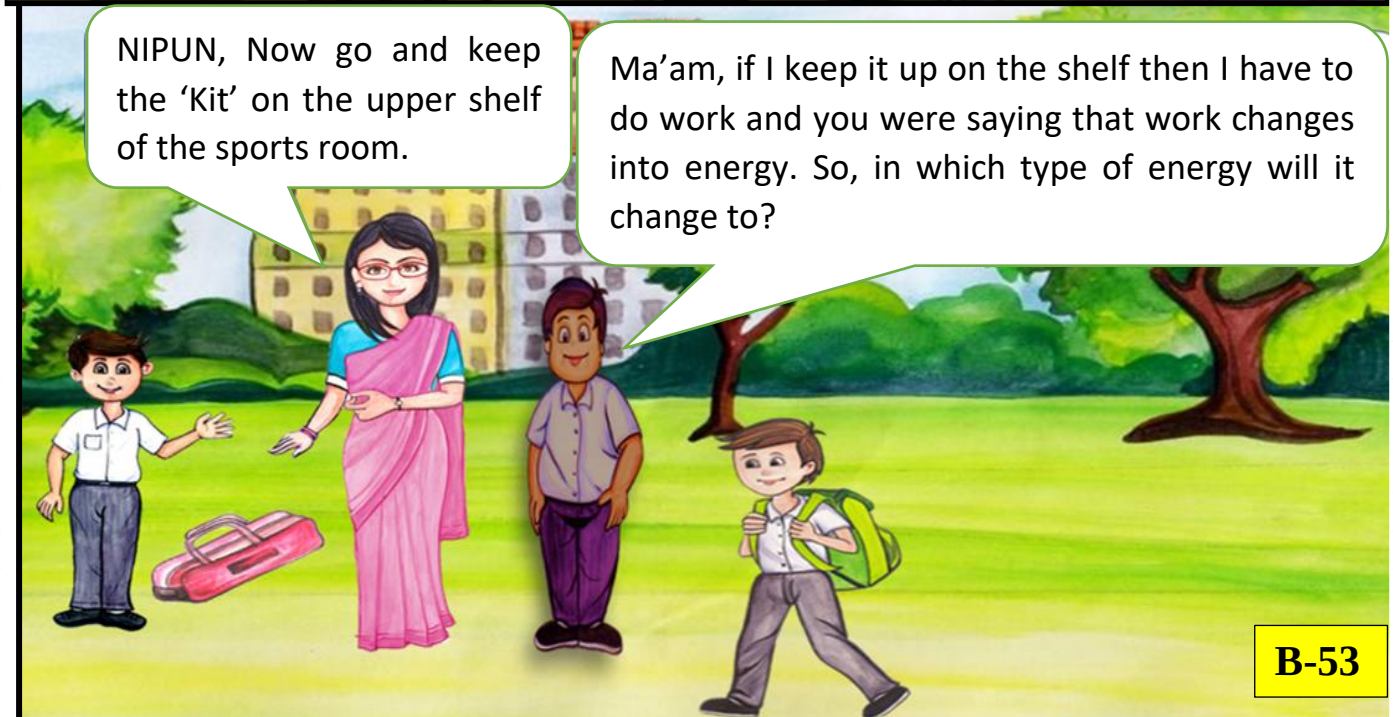
VERY GOOD



B-52

NIPUN, Now go and keep the 'Kit' on the upper shelf of the sports room.

Ma'am, if I keep it up on the shelf then I have to do work and you were saying that work changes into energy. So, in which type of energy will it change to?



B-53

Good question. This work will become 'Gravitational Potential Energy' as you will do work against gravity. Now go and after keeping the kit, come back to class.



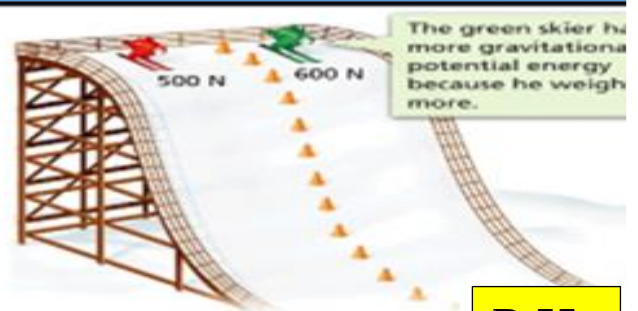
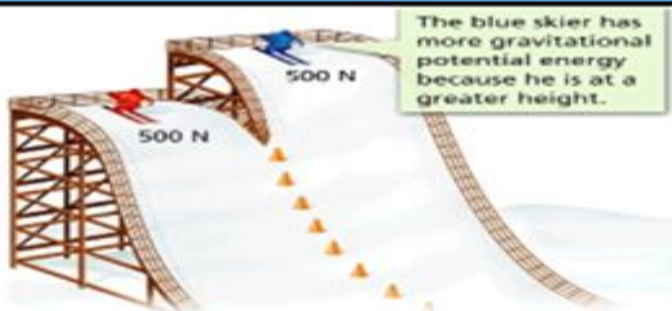
B-54

GRAVITATIONAL POTENTIAL ENERGY of an object is the work done in raising the object from the ground to any point, above the ground, against gravity.

It can be calculated by

$$P.E. = m \cdot g \cdot h$$

Where m is mass, g is acceleration due to gravity and h is height and its SI unit will also be Joule.



$$GPE = \text{Mass} \times \text{Acceleration due to Gravity } (9.8/s^2) \times \text{Height}$$

(mgh)

B-55

Back in Classroom

Nipun, why did you take so much time?

Ma'am, when I was keeping the 'kit', one ball fell from it. So, I had to keep the ball back again.

B-56

But Ma'am, I was thinking that while coming down, ball's potential energy becomes lesser and lesser.

Yes you are right, but remember that this energy is not lost but changed into kinetic energy. Remember that Total Energy is conserved.

B-57

" LAW OF CONSERVATION OF ENERGY "

ENERGY can neither be created nor destroyed. It can only be converted from one form to other. Total energy remains conserved, anywhere in the Universe and in any situation.

B-58

School gets over.....

Naveen and Nipun, are you coming to my place in the evening? We will go to the park with my father and play.

Yes, Sure it will be fun.

B-59

WORKSHEET III

I MULTIPLE CHOICE QUESTIONS:

1. A microphone converts:

- (a) Mechanical energy in stereo system into electrical energy
- (b) Sound energy into electrical energy in public address system
- (c) Electrical energy into sound energy in ordinary telephone
- (d) Microwave energy into sound energy in a mobile phone

2. Which of the following energy change involves frictional force?

- i. Potential energy to sound energy
- ii. Chemical energy to heat energy
- iii. Kinetic energy to heat energy
- iv. Chemical energy to heat energy

Choose the correct option among the following:

- (a) Both (i) and (ii)
- (b) Only (iv)
- (c) Both (ii) and (iii)
- (d) Only (iii)

3. A body is falling from a height h . After it has fallen to a height of $h/2$, it will possess:

- (a) Only kinetic energy
- (b) Half kinetic and half potential energy
- (c) Only potential energy
- (d) More kinetic and less potential energy

4. A man of mass 50 kg jumps to a height of 1 m. His potential energy at the highest point is ($g = 10 \text{ m/s}^2$):

- (a) 50 J
- (b) 500 J
- (c) 5 J
- (d) 5000 J

II. FILL IN THE BLANKS:-

1. A body on a tower possesses-----energy.
2. A stretched bow has -----due to change in shape.
3. Energy can not be created nor -----.
4. If a car is accelerated on a levelled road then its ----- energy changes.

III. TRUE OR FALSE:-

1. If a person is winding a watch, he stores kinetic energy in it.
2. In a oscillating pendulum, kinetic energy is maximum at its mean position.
3. Water stored in a dam possesses potential energy.
4. when a person standing on the ground lies down on the ground, his kinetic energy decreases.

IV. JUMBLED WORDS:-

1. RAGYVTI
2. EWNOTN
3. SNCOREVTAION
4. TEPONITAL

V. MATCH THE FOLLOWING:-

COLUMN I	COLUMN II
1 . Lifting a book	1 . Chemical energy into kinetic energy
2 . Steam engine	2. increase potential energy
3 . Moving of a car	3 . Heat energy into mechanical energy

ANSWER KEY

I MCQ:-

1 (b)

2 (d)

3 (b)

4 (b)

II FILL IN THE BLANKS:-

1 Potential

2 Potential energy

3 Destroyed

4 Kinetic

III TRUE AND FALSE-

1 FALSE

2 FALSE

3 TRUE

4 FALSE

IV JUMBLED WORDS:-

1 GRAVITY

2 NEWTON

3 CONSERVATION

4 POTENTIAL

V. MATCH THE FOLLOWING;-

COLUMN I

COLUMN 2

1 ----- 2

2 ----- 3

3 ----- 1

In the Park.....

I have more muscles than you. And I have more energy.

Let's race then it will be clear whether you have more energy or not.

B-60

They raced with each other. Nipun comes first.

B-61

See, I have more energy than both of you.

No, we also did the same work as you have, so we have the same energy. We have covered the same distance as you and applied the same force.

Shourya you are right.

B-62

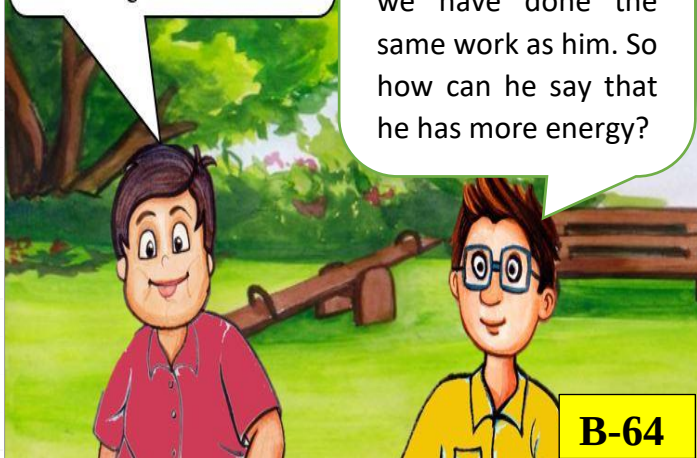
Children start arguing. Listening to their arguments, Shourya's father comes and asks them what their argument is about?



B-63

Uncle, they are saying that I don't have more energy than them though I won the race.

But Uncle, Ma'am has taught us that energy is equal to work and we have done the same work as him. So how can he say that he has more energy?



B-64

Son, Nipun has more power than both of you. He completed the race in less time so he is more powerful.

But Papa what is the difference between energy and power?

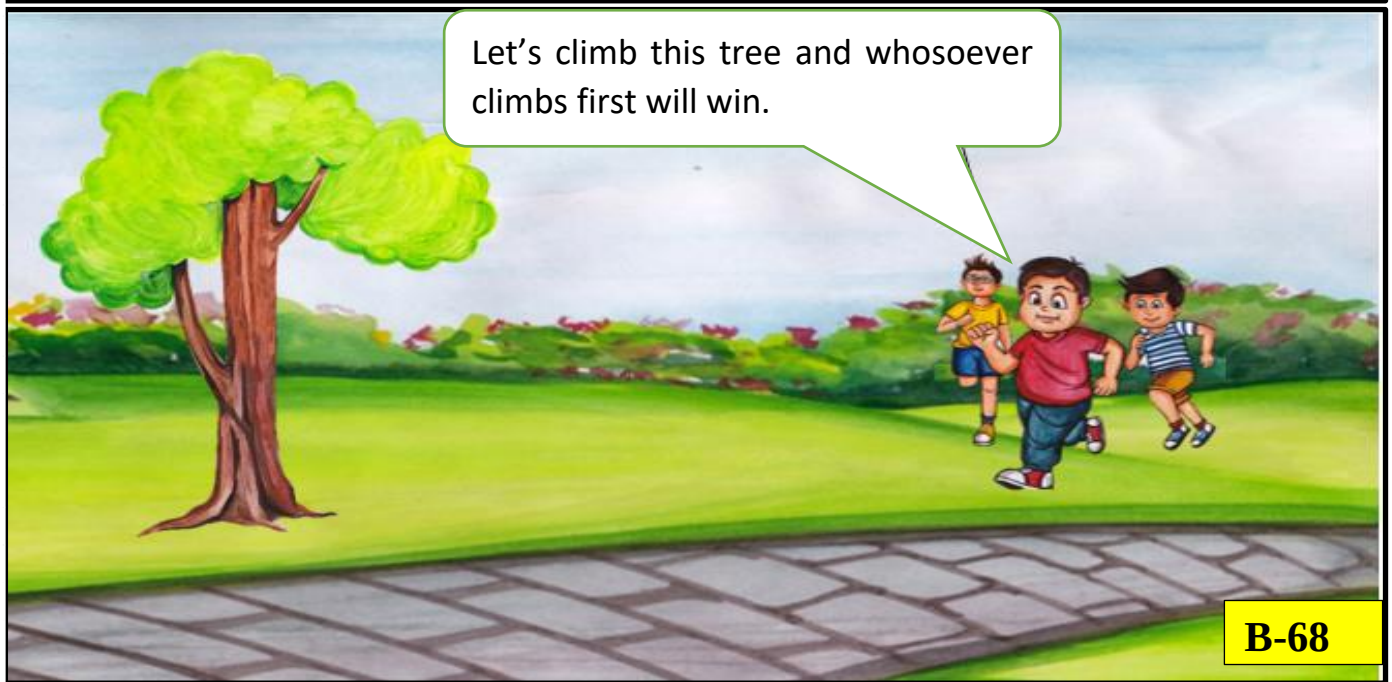
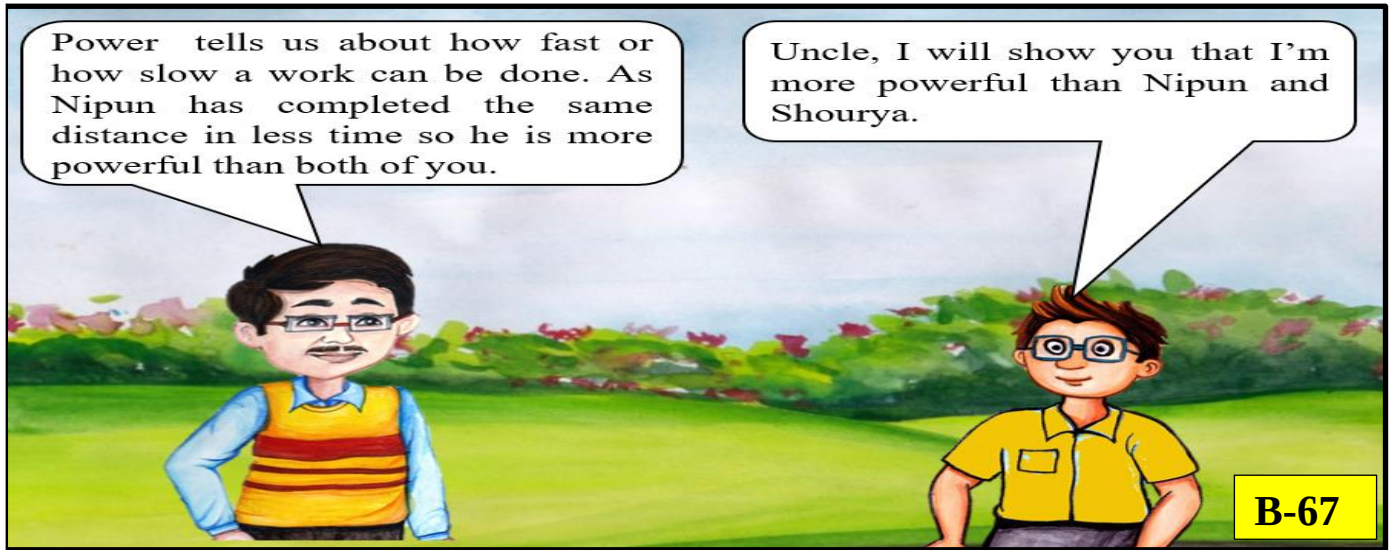


B-65

Beta, Power is the rate of doing work or the rate of energy consumption.



B-66



Next day children were shouting and playing in the class when suddenly teacher enters and all sit quietly.



B-71

What was the topic of discussion, Shourya?

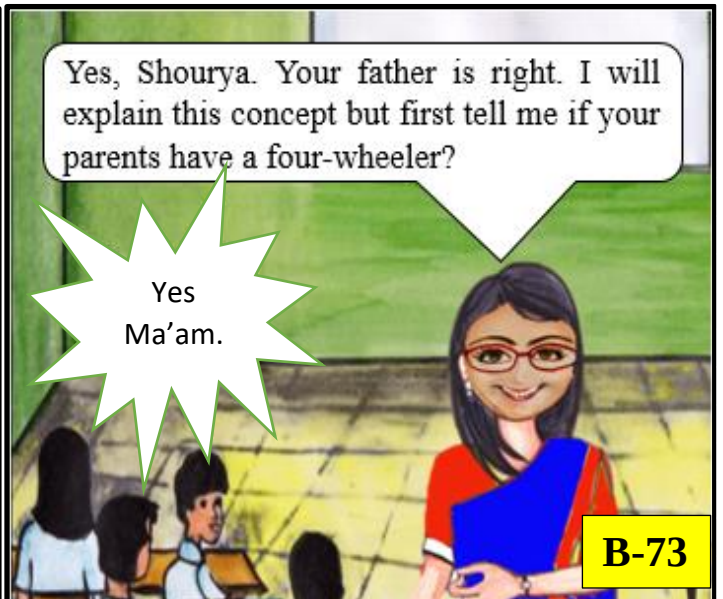
Ma'am, we were talking about doing work fast or slow. Yesterday, my father told us that power is different from work. Is it so, Ma'am?



B-72

Yes, Shourya. Your father is right. I will explain this concept but first tell me if your parents have a four-wheeler?

Yes Ma'am.



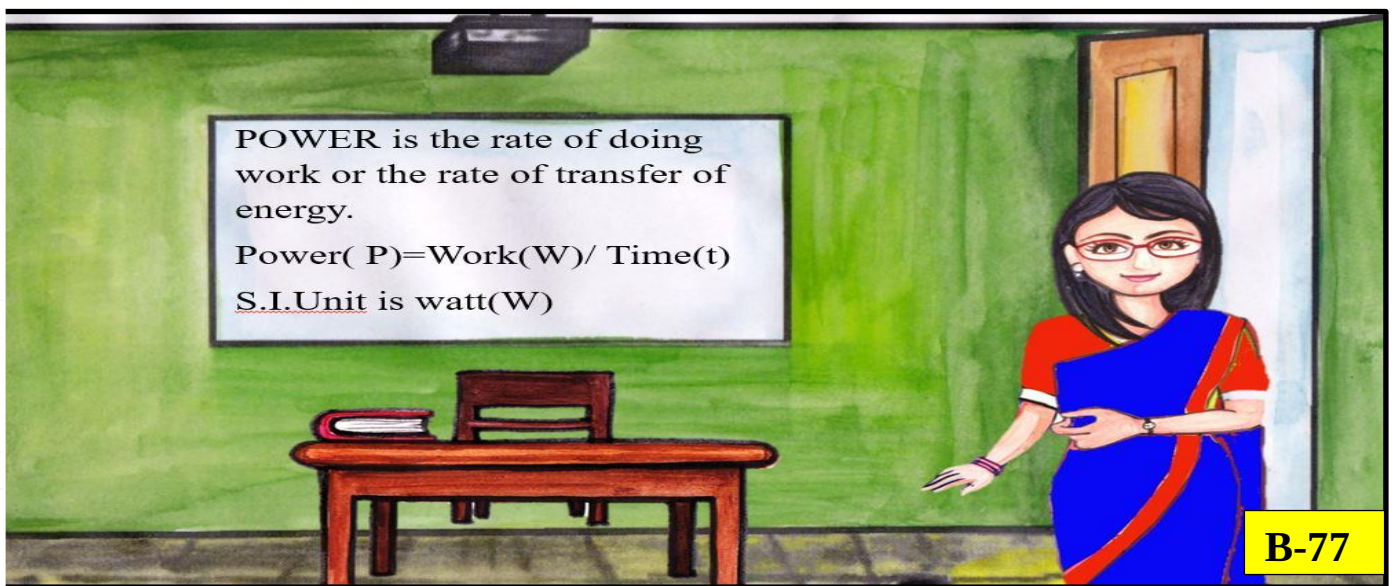
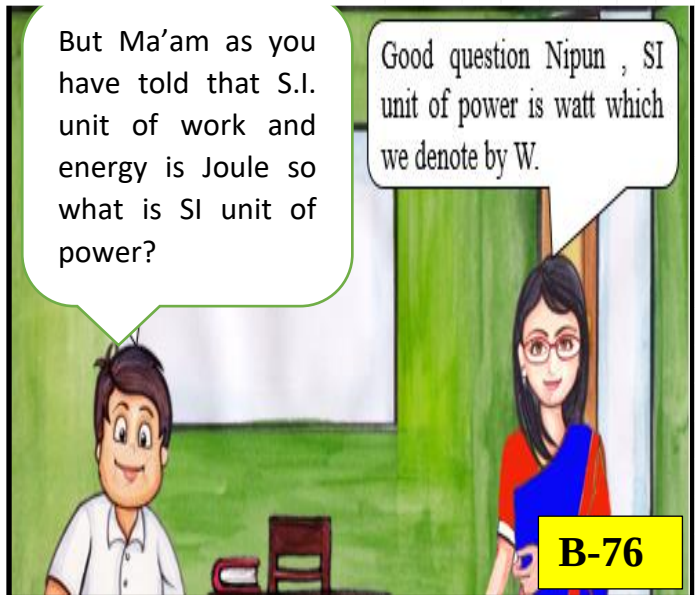
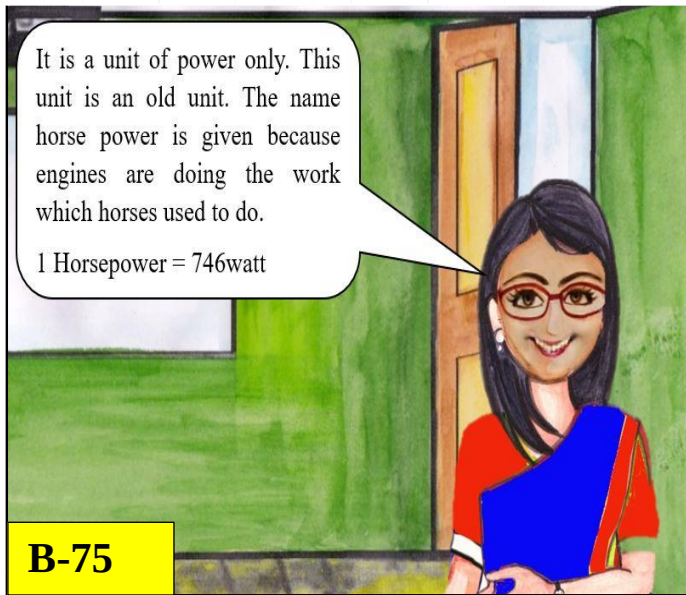
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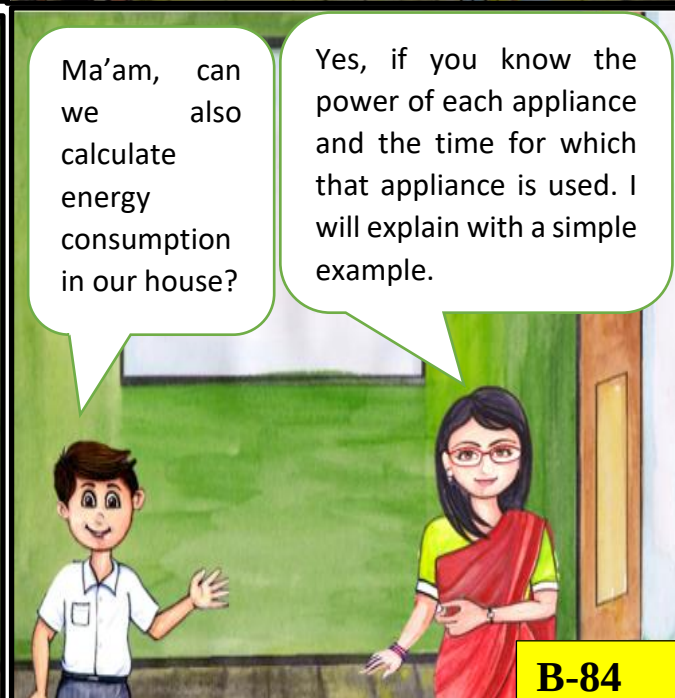
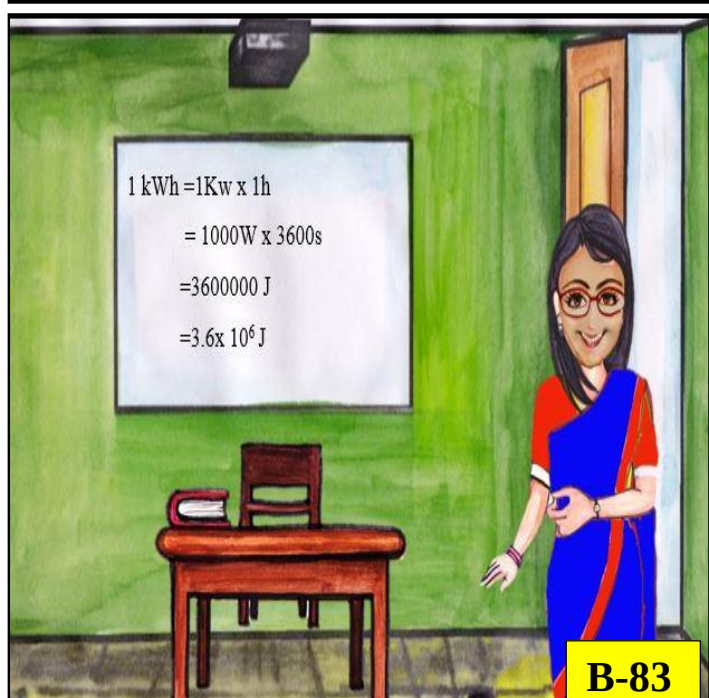
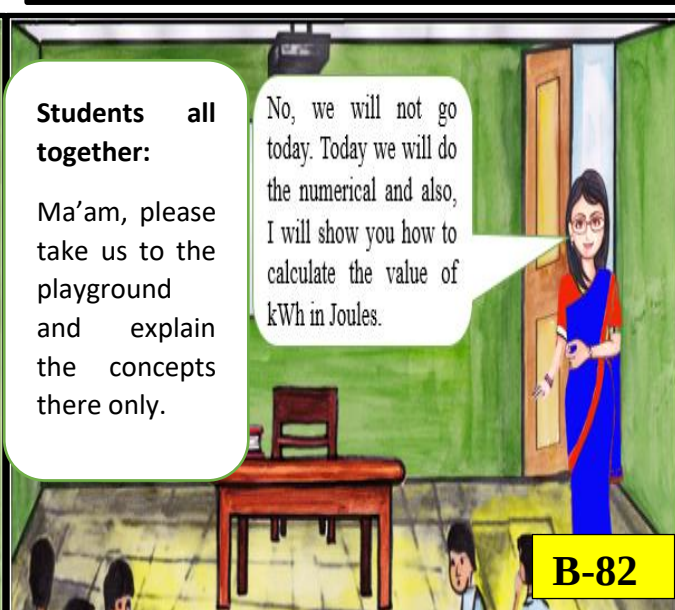
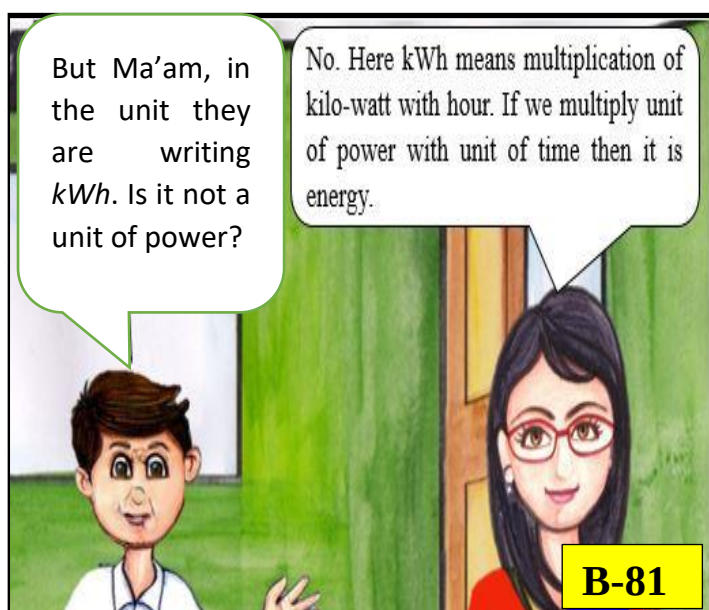
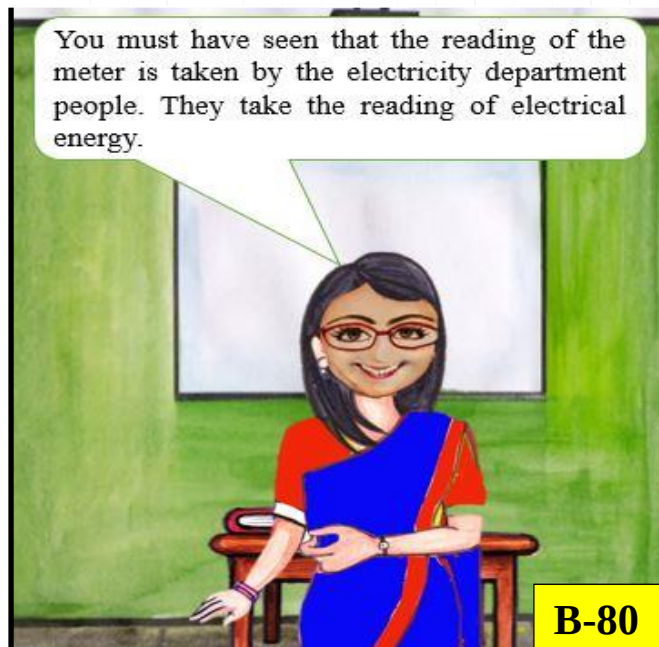
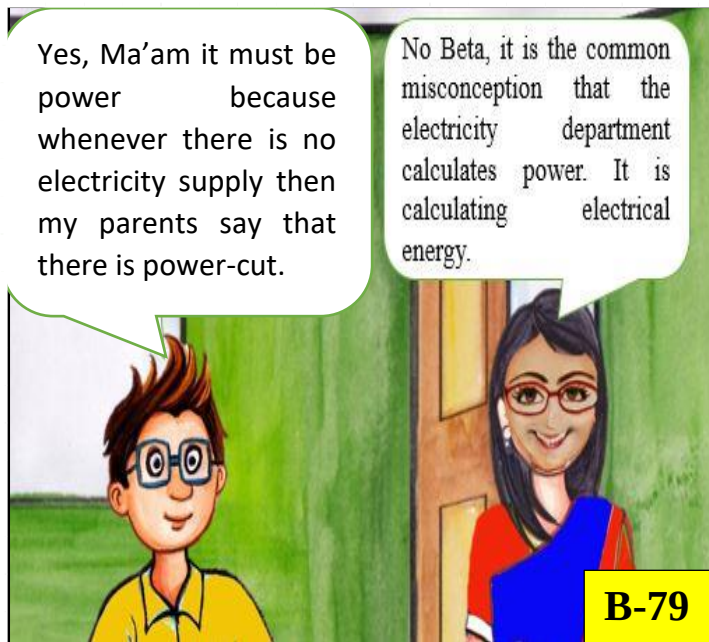
These vehicles come with the power written on them. It means how quickly it can gain the speed.

But Ma'am, in the vehicle power is written in horsepower. What is horsepower?



B-74





Q. Calculate the energy consumed by two bulbs of 60 W and 2 fans of 120 W, when both are used for 6 hours daily.

Sol. 1. Power of one bulb

$$= \frac{600}{1000} \text{ kW}$$

∴ Energy consumed by two bulbs:

$$= 2 \times \frac{600}{1000} \times 6$$

$$= 0.72 \text{ kW} - h$$

Power of one fan

$$= \frac{120}{1000} \text{ kW}$$

∴ Energy consumed by two fans:

$$= 2 \times \frac{120}{1000} \times 6$$

$$= 1.44 \text{ kW} - h$$

∴ Total energy consumed

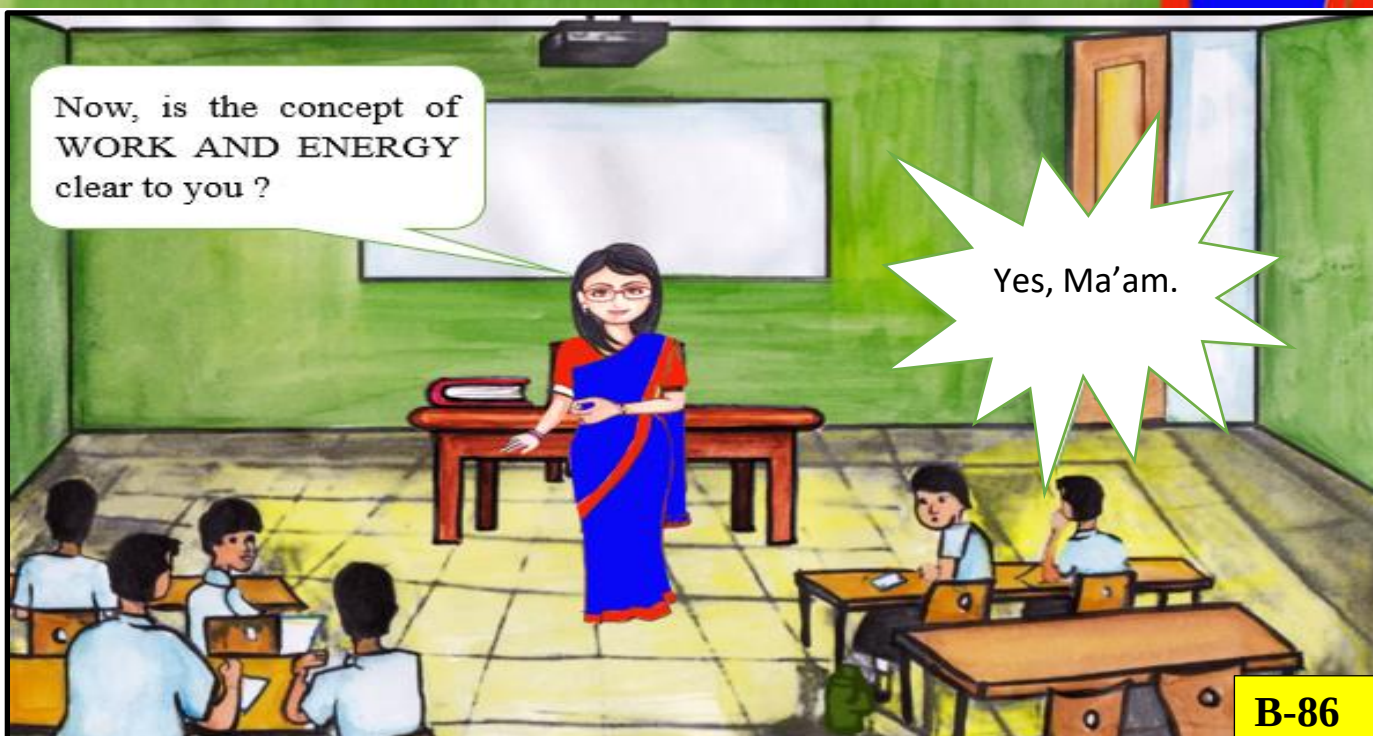
$$= 0.72 + 1.44$$

$$= 2.16 \text{ kW} - h$$



Now, is the concept of
WORK AND ENERGY
clear to you ?

Yes, Ma'am.



WORK SHEET IV

I MULTIPLE CHOICE QUESTIONS :-

1 . Which one of the following is not the unit of energy?

- (a) Kilowatt
- (b) Kilowatt hour
- (c) Joule
- (d) Newton meter

2 . The form of energy possessed by a flying aeroplane is

- (a) Kinetic energy
- (b) Potential energy
- (c) Both kinetic and potential energy
- (d) Can't say

3. In the electricity bill, 'unit ' refers to:

- (a) Kilowatt hour
- (b) Joules
- (c) Watt
- (d) Horse power

4. A. Stretched spring has potential energy.

B. Stone at a height has Kinetic Energy.

Choose the correct option

- (a) 'A' is right, 'B' is right
- (b) 'A' is right, 'B' is wrong
- (c) 'A' is wrong, 'B' is right
- (d) 'A' is wrong, 'B' is wrong

II TRUE FALSE

- 1: When we stretch a rubber band the elastic potential energy of rubber band decreases.
- 2: If a person is PUSHING A box, he stores kinetic energy in it.
- 3: In an oscillating pendulum, potential energy is maximum at mean position.
- 4: Unit of electrical energy is Kw-h.

III FILL IN THE BLANKS:

1. . Value of 1 *kW-h* is _____ Joules.
2. Power is the rate of doing _____.
3. Battery changes chemical energy into _____ energy.
4. When a bag is lifted up then work done by gravity is _____.

IV MATCH THE FOLLOWING:-

COLUMN I	COLUMN II
1. <i>kW-h</i>	1. 746J
2. Joule	2. Power
3. Watt	3. Joule
4. Horse power	4. watt
5. Newton-meter	5. Commercial unit
6. Joule/ second	6. Energy

V. JUMBLED WORDS:-

1. HECMCAIL
2. WEPOR
3. COCIALMMER
4. PULCATTA
5. ERSOH OWEPR

ANSWER KEY

I MCQ:-

- 1 (a)
- 2 (c)
- 3 (a)
- 4 (b)

II TRUE AND FALSE:-

- 1 FALSE
- 2 TRUE
- 3 FALSE
- 4 TRUE

III FILL IN THE BLANKS:-

- 1 3.6×10^6
- 2 work
- 3 Electrical
- 4 Negative

IV MATCH THE FOLLOWING:-

COLUMN 1

COLUMN 2

- | | |
|---------|---|
| 1 ----- | 5 |
| 2 ----- | 6 |
| 3 ----- | 2 |
| 4 ----- | 1 |
| 5 ----- | 3 |
| 6 ----- | 4 |

V JUMBLED WORDS:-

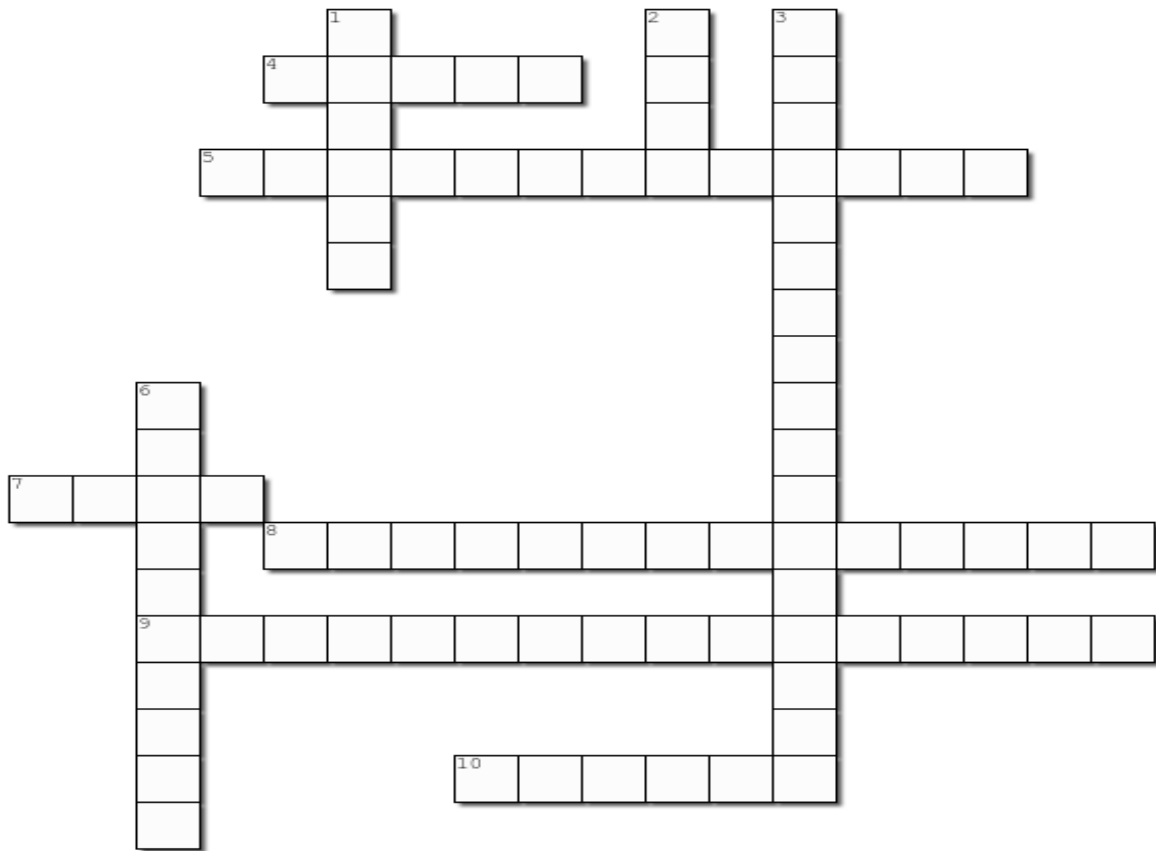
- 1 Chemical
- 2 Power
- 3 Commercial
- 4 Catapult
- 5 Horse Power

CROSSWORD PUZZLE

Name: _____

WORK and ENERGY

Complete the crossword puzzle below



Created using the Crossword Maker on TheTeachersCorner.net

Across

4. rate of doing work
5. commercial unit of energy
7. product of force and displacement
8. energy possessed by a moving object
9. energy possessed by position and configuration
10. capability to do work

Down

1. unit of work
2. unit of power
3. kinetic + potential energy
6. 746 watt

ANSWER KEY

VI CROSS WORD:-

ACROSS

4. POWER
5. KILOWATT-HOUR
7. WORK
8. KINETIC-ENERGY
9. POTENTIAL-ENERGY
10. ENERGY

DOWN

1. JOULES
2. WATT
3. MECHANICAL-ENERGY
6. HORSE-POWER

-:GLOSSARY:

1.WORK:- WORK done is the magnitude of force(F) multiplied by displacement (s) of the object in the direction of applied force. It can be zero or negative or positive.

2. S.I. UNIT:- SI Unit is standard unit of measurement defined by the International System of Units which have official status in nearly every country in the world.

3. ENERGY :- Energy is defined as the capability to do work. Objects which does the work loses energy and the object on which the work is done gains energy.

4. KINETIC ENERGY:- Energy possessed by an object by virtue of its motion. It is equal to the work done on it to make it acquire that velocity.

5. POTENTIAL ENERGY:- Energy possessed by an object by virtue of its position or configuration.

6. GRAVITATIONAL POTENTIAL ENERGY:- This is the Energy possessed by the body due to its height from the ground. It is equal to the work done in raising an object from the point above the ground.

7. MECHANICAL ENERGY:- Sum of the kinetic and potential energies of an object is called the Mechanical Energy.

8. LAW OF CONSERVATION OF ENERGY:- According to this Law, Energy can only be transformed from one form to another; it can neither be created nor destroyed. Total energy before and after the transformation always remains constant.

9. POWER:- Power is the rate of doing work or rate of transfer of energy.

10. COMMERCIAL UNIT OF ENERGY:- It is used in electrical energy. This unit is **Kilowatt-hour (kWh)**. Energy used in 1 hour at the rate of 1 kW is called 1 kWh. $1 \text{ kWh} = 3.6 \times 10^6 \text{ Joules}$.

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10. Google chrome Browser

11. Windows-10 O.S.

PRINCIPAL'S MESSAGE

Work & Energy

It is with great joy that I pen these few lines for the science Graphic Novel 'Work and Energy'. The topic of work and energy is so abstract that it is very difficult for any teacher to explain the concept of energy and extremely tough for students to understand the concept of energy. The science teachers have used a beautiful storyline to make the students understand the concept of energy in such an easy way that through the simple events of daily life students grasp what is energy.

I also wish to congratulate the IX standard Science teachers who in collaboration with art and IT teachers brought out this piece of artwork which will prove to be useful for all class IX students across the country.

I also wish to thank and congratulate the Science subject teachers of class IX who in collaboration with the Art and Drawing teachers and I. T. teachers brought out this valuable piece of art work which can be used by anyone, especially the students from class IX all over the country.

I am also thankful to Mr. Sandeep Sethi who guided and motivated our teachers to prepare this wonderful work in spite of his busy schedule. It is his persistent efforts that came to fruition in the form of this creative art, the graphic novel 'Work and Energy' an abstract topic made relevant and cognizable for students in an easy way.

Congratulations!!!! To the entire team and thank you for making the best use of this lockdown period for the welfare of students through this creative work.

Fr. Thomas Maniparambil

Principal

SUMMARY

This story is about students of class 9th who were keen in learning the concepts of work and energy from their teacher. The teacher in her quest to teach in the most interesting way employed play-way method of teaching. All the concepts were taught on the playground. Students by their inquisitive temperament learnt to apply the concepts in their day-to-day life, while at home and in their evening games. Teacher was delighted to see how smoothly the students glided to grasp the concepts of this chapter of work and energy.



ST. ANSELM'S PINK CITY SCHOOL

MALVIYA NAGAR, JAIPUR

Affiliated to C.B.S.E.