UNIT 5



Pre-task

Read this newspaper report.

Sunday, April 10, 2016 | 12:06 p.m.

THIRUVANANTHAPURAM, India — The Hindu temple in southern India was packed with thousands for a religious festival early Sunday when the fireworks began — an unauthorized pyrotechnic display that went horribly wrong. Explosions and a massive fire swept rapidly through the Puttingal temple complex at about 3 a.m. in the village of Paravoor, killing 102 people and injuring 380 others. Scores of devotees ran in panic as the massive initial blast cut off power in the complex, while other explosions sent flames and debris raining down, a witness said. Many people were trapped inside. "It was complete chaos," said Krishna Das of Paravoor. "People were screaming in the dark. Ambulance sirens went off, and in the darkness no one knew how to find their way out of the complex." Das said the first deafening explosion occurred as the fireworks display was about to end and as he was walking away. It was followed by a series of blasts, he added.

Tick mark True (T) or False (F).

1.	The accident occurred on a Sunday evening.	T	F
	,		-

- 2. About 380 people were killed in the accident.
- 3. The accident occurred because of fireworks. T | F
- 4. There were many blasts when the temple caught fire. $T \mid F$
- 5. The devotees ran in panic as there was no electricity. $T \mid F$

Read

PLAYING WITH FIRE

One of our favourite festivals in India is Deepavali, or Diwali as it is known in the North. There is nothing to match the excitement when crackers go off in the night sky with a loud bang and a brilliant shower of colours. Many of us might wonder how these fireworks are made, and what goes into them. The physics and chemistry of fireworks is as interesting as the sound and the light they emit.

The science of fireworks is technically called, 'pyrotechnics' - from the Greek word, 'pyr' meaning fire and 'technics' meaning an art. Pyrotechnics includes not only fireworks but also a whole range of devices that use

similar materials and principles, from safety matches that we use every day to solid fuel rocket boosters of the space shuttle. The household match is considered a special pyrotechnic device, as all the pyrotechnic effects heat, smoke, light, gas and sound are present in it.

Some historians say that 'black powder, the basic material used in fireworks, was invented in India. Shukranti, written more than two thousand years ago, has references to weapons similar to guns and projectile weapons. However, the Chinese are generally considered the pioneers of pyrotechnics. They are said to have developed, 'black

powder' more than one thousand years ago. It took at least two hundred years for the knowledge to spread to the west, and it was only in 1242 that an English monk, Roger Bacon, revealed the formula for "black powder". He considered it such a dangerous substance that he wrote of it in a code language.

The basic formula of the black powder, or gun powder, has remained unchanged for centuries. It is a blend of potassium nitrate, charcoal and sulphur in the ratio of 75:15:10 by weight. It is almost the perfect combination as it is and no further improvements or alterations need to be made. Experts say that this might be the only chemical product still using the same age old proportions and manufacturing techniques.

However, with the development of modern chemistry, light and colour effects have become common in fire works. In the last century, the discovery of aluminium, magnesium and titanium, which burn at high temperatures emitting bright light dramatically improved the brilliance of fireworks. Similarly, colours too are a recent development. The principal colour emitters in pyrotechnics were identified after decades of research. These colours are formed in one of two ways – luminescence and incandescence.

Incandescent light is produced when a substance is heated so much that it begins to glow. Heat causes the substance to become hot and glow, initially emitting infra red, then red, orange, yellow, and white light as it becomes increasingly hotter. When the temperature of a fire work is controlled, the glow of its metallic substances can be manipulated to be desired colour at the proper time.

The principle behind any firework is that when heat is applied to fuel (the gun powder), it burns using oxygen. However, because the fuel is packed tightly to keep the heat in the burning takes place all of a sudden. it causes the characteristic loud noise. The actual manufacturing process of fire work is simple. The raw materials required are fuel, binders, oxidizers (to make it burn), and a few other materials. The ingredients are ground and mixed well, the mixture is pushed through a machine from which it comes out as long rolls or strips, and then rolled in cardboard or old newspapers with a fuse.

The greatest danger of pyrotechnics is that it deals with fire. The industry is notorious for its accidents, whether in the U.S.A., Japan or India. Though the mixture is stable if kept cool and dry, it can catch fire if heat is accidently applied, through too much friction sometimes, or from a spark or an impact. Scientists are looking for ways of making fireworks safer.

In India, fireworks used to be imported from China. During the Second World War, these imports were stopped, and the safety match producers of Sivakasi in Tamil Nadu began manufacturing fireworks for Deepavali. In 1992, the country used about 60 crores worth of firework and 60 to 70 percent of this came from Sivakasi.

In Sivakasi, fireworks are manufactured in a number of small units. Three months before the festival is the busiest time for these units. Fireworks are transported to every nook and corner of the country. The working conditions of these units are however far from satisfactory. There are very few testing facilities for quality or uniformity, and hardly any safety measures in force. This is why we hear of accidents in Sivakasi year after year. It is very difficult to get information on how to manufacture fireworks because it is not considered safe to give everybody the details. Only a very few reliable persons are taught this art.

In many countries, fireworks are not allowed to be used by individuals. Only community displays, specially organized with the help of experts, are allowed. A great

deal of care is taken for safety at these displays. However, since even children are allowed to play with fireworks in India, it is important to observe certain safety rules.

Fireworks should be stored, handled and lit with care. They should never be stored or unpacked near a flame, gas cylinder or heater. One should never wear long, loose clothes or nylon clothes when lighting crackers. And since the powder in crackers is poisonous, they should never be carried loose in your pocket or your hand. Also, fireworks should never ever be lit inside a house. Never bend over a firework when you are lighting it and never use fireworks to frighten people. If in spite of being careful, you do get a burn, go to a doctor instead of applying oil or ointment.

With care and consideration we can make our favourite festival a much safer one.

Glossary

crackers fireworks \$21531 bang a sharp metallic sound emit throw out light or heat pyrotechnics the art of making and using fireworks device a weapon that explodes include make a part of something **principle** basic theory, law **shuttle** vehicle that travels back and forth between places historic famous or important in history historical relating to/based on history historian person who writes on studies of history weapon something (as a club, gun, knife) that is used for fighting, attacking or defending **pioneer** person who helps to create, develop new ideas, methods etc. **substance** material of particular kind **blend** combination **ratio** the relationship in quality, amount or size between two or more things proportion amount that is a part of a whole incandescent light ગરમીથી ઉત્પન્ન થતો પ્રકાશ luminescence પ્રકાશ discovery the art of finding something for the first time invention create something new આવિષ્કાર decade period of ten years fuel a material (coal, oil, gas etc.) that is burnt to produce heat or power raw in a natural state / not treated or processed binder material that is used to hold things together ingredients things that are used to make product etc. **notorious** infamous especially for something bad **friction** the effect of rubbing one thing against another **impact** to hit(something) with great force **uniformity** the quality or state of being the same reliable likely to be true or correct nook and corner in all the directions

I feel...

- What attracts you most about the festival Diwali?
- What safety measures do you take while bursting fire crackers?
- Have you ever experienced any fear while bursting big fire crackers?
- What did you feel when you got injured while firing crackers? How did your parents help you in such circumstances?

Vocabulary

V.1 Circle the word which is an outsider and use it to make a meaningful sentence.

1. fireworks	black powder	substance	a. Adoesn't include years.
2. coal	LPG	weapon	b. A is not a fuel.
3. famous	well known	notorious	c. Adoesn't mean popular.
4. decade	century	light year	dcan't be in the group of fireworks.
5. discovery	invention	pioneer	edoesn't mean hit with force.
6. bang	emit	strike	f. Sam Pitroda was the of
			telecom revolution.

V.2	Replace the words in <i>italics</i> with a single meaning. Write them in the blanks. †	word from the g	glossary that has the same
	1. Have you collected all the items to prepare this	s delicious recipe?	
	2. I have been living in the same house for tenyed	ars.	
	3. Many people saw apples falling, but Newton	found out the grav	itation causing its falling.
	4. The Time Shuttle -I took off with a big sharp s	cound from the laur	ching station.
	5. This diamond is not polished or processed so	it is not much value	ed in the market
V.3	What is 'it' in each of these sentences? The wo		
	1. It spreads everywhere in the house and burns		
	2. It gives us information about past <i>events</i> and o		
	3. It is used to <i>kill</i> enemies in a war.		
	4. It is a <i>material</i> of something.		
	5. It is what we use to <i>run</i> our vehicles		
	6. It is what we use to heal our <i>burnt skin</i>		
V.4	Strike off the misfit word for each sentence.		
	1. It is believed that India discovered/invented	black powder.	
	2. Scientists use shuttles/planes to conduct rese	earch in space.	
	3. Do you know the art/formula of making carb	on dioxide?	
	4. The person who works for the betterment	of the society be	comes famous/notorious.
	5. We import/export rough diamonds from Bra	zil.	
V.5	Complete each sentence using a more common	n word than the w	ord in the bracket.
	Sample: He usually comes by train but sometim	nes he comes by tax	xi. (occasionally)
	1. His sharp memory to recite the Ramayana at t	he age of four	one and all. (amazed)
	2. When any firework is lit, it light a	nd gas. (lets out)	
	3. Once I came across a Buddhistwl	ho explained Budd	hism to me. (saint)
	4. The president of the Blind institution explanation (principal)	ained c	objectives of that institution.
	5. If you take of milk and butter milk	k, it will become les	ss sour. (combination)
V.6	Circle the correct answer. There can be mor	e than one correc	et answer.
	1. Which can be used as fuel?		
	(a) coal (b) petrol	(c) wood	(d) oxygen
	2. Which is an invention?		
	(a) a TV set (b) a cell phone	(c) the Mars	(d) the law of gravitation
	3. Which one is not a good quality?		
	(a) famous (b) polite	(c) notorious	(d) well-known
	4. What are an arrow, a gun, a sword etc. calle	d?	
	(a) tools (b) devices	(c) weapons	(d) instruments
	5. A pen, a pencil, a book What else can be a		
	(a) a compass box (b) a ruler	(c) shocks	(d) shoes
	6. Water is a blend of oxygen and what?	() 0	/ f) TT - 1
	(a) Nitrogen (b) Carbon Dioxide	(c) Ozone	(d) Hydrogen
	7. Which can be similar to 'device'?	() 1	(1)
	(a) tool (b) weapon	(c) spade	(d) axe

V.7 Some verbs have different meanings when they are used with different prepositions; they are called phrasal verbs. Read them carefully.

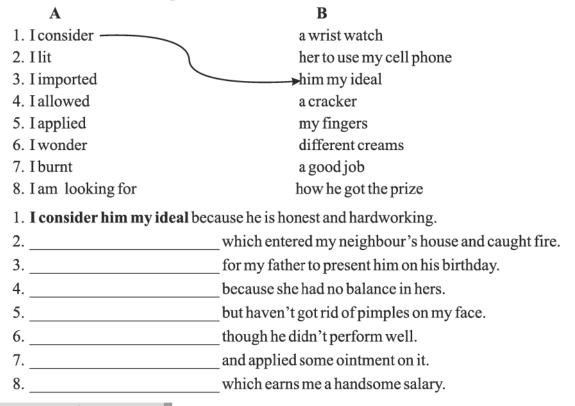
Word with preposition	Meaning	Sentence
get out	to cause to leave	I heard a big noise and got out.
come back	return	We came back from the fun fair at midnight.
wake up	stop sleeping	The little child wakes up several times during the night.
run off	leave home	The thiefran off with my laptop.
get in	enter	When the thief got in, Rupal was doing sums.
shout out	speak or call in a loud voice	Jignesh shouted out when he sighted a snake near the pot.
get up	arise	My mummy always gets up at 5 a.m. sharp.

Now complete the story with t	he words give	n in the first column of t	the table.
Last night I left my bedroom wi	ndow open and	d a burglar managed to	. When he
was near my bed, he made a noi	se and I	and	the burglar at once
ran to the window to	I think	he hurt himself as he fell	on the path outside but he
and	I don't t	hink he will	

V.8 Read and understand the root words and their meanings and add one or two more word/s in the example. (You may take help of a dictionary.)

Words	Root	Meaning	More Examples
describe, transcribe	scribe	writing	
transport	port	carry	
fluid	flu	flow	
audience	aud	hear	
primary	prim	first	
microphone	micro	small	
telephone	tele	far off	
autobiography	auto	self	

V.9 Match A with B to complete the sentences.



Comprehension

C.1 Tick mark the correct option.

1.	What do the firework	ks release?		
	(a) shower of colour	(b) excitement	(c) loud explosion	(d) sound and light
2.	What is gun powder	a mixture of?		
	(a) heat and smoke		(b) oxygen and nitro	gen
	(c) potassium nitrate,	, charcoal, sulphur	(d) charcoal, gas and	magnesium
3.	Fire works were imp	orted to our country fron	n	
	(a) China	(b) Japan	(c) United Kingdom	(d) the USA
4.	Roger Bacon was	and he bel	onged to	·
	(a) a priest- China	(b) a scientist-England	(c) a priest-England	(d) a historian- Japan
5.	How do we feel whe	n we see crackers explod	ling in the sky?	
	(a) fear of fire	(b) surprise	(c) thrill	(d) respect for science
6.	When the firework is	s heated, it burns using _		<u></u> .
	(a) carbon dioxide	(b) oxygen	(c) nitrogen	(d) helium
7.	The art of fire work i	s taught only to		
	(a) trained workers	(b) the reliable persons	(c) the scientist	(d) the monks
Ti	ck mark True(T) or l	False(F).		
1.	The Japanese were the	e first people to invent fire	works. T F	7
2.	An Australian monk re	evealed the secret of firew	vorks.	7
3.	The ancient text descr	ibing fireworks is Shukra	nti. T F	7
				_

C.2

4. Sivakasi is the major producer of fireworks in India.	TF
5. On getting a burn due to fireworks, you should first apply oil on it.	TF
6. Incandescent light is produced by heating an object till it glows.	TF
7. The formula of gunpowder is perfect and need not to be changed.	TF
8. The household match is a special pyrotechnic device.	TF
9. The greatest danger of pyrotechnics is sound.	TF
10. One must light a firework wearing long, loose nylon clothes.	TF

C.3 Find out sentences from the Read that have nearly the same meaning as these.

- 1. According to some historians, the Indians invented 'black powder'.
- 2. For thousands of years, there has been no change in the basic formula of gun powder.
- 3. Modern chemistry has made light and colour effects more common in fireworks.
- 4. Burning of aluminium, magnesium and titanium at a high temperature emits bright light.
- 5. If the mixture is kept cool and dry, it is stable, but it can catch fire if heat is accidentally applied.
- 6. In India, even children play with fireworks. We must observe certain safety rules.
- 7. During the Second World War the safety match producers started manufacturing fireworks for Diwali.

C.4 Answer these questions in one sentence.

	-
1.	What does the word 'pyr' mean? Ans:
2.	Why is the household match considered a special Pyrotechnic device?
	Ans:
3.	Why did Roger Bacon write the formula of Pyrotechnic in a code language?
	Ans:
4.	What is the basic formula of black powder ? Ans:
5.	What is the principle behind any fire work? Ans:
6.	Why do fire accidents occure in Sivakashi? Ans:
7.	Why are only a few reliable persons taught the art of manufacturing fire works?
	Ans:

C.5 Answer these questions in two to three sentences each.

- 1. What are the pyrotechnics effects in the household match device?
- 2. Describe the development of black powder in India.
- 3. Who introduced black powder in the West? What was his opinion about it?
- 4. How have light and colour effects improved?
- 5. How is incandescent light produced?
- 6. What are the dangers of pyrotechnics?
- 7. Describe fireworks production in Sivakashi.

C.6 Write short notes with the help of given points.

- 1. **Pyrotechnics:** science of fireworks root words and meaning, a whole range of devices, safety matches, solid fuel rocket boosters of the space shuttle pyrotechnic effects- heat, smoke, light, gas and sound.
- 2. **Safety Precautions:** Fireworks should be stored, handled and lit with care never be stored or unpacked near a flame, gas cylinder or heater one should never wear long, loose clothes or nylon clothes when lighting crackers never ever be lit inside a house never bend over a firework if get a burn go to a doctor instead of applying oil or ointment.

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3. **Gunpowder:** black powder or gun powder, the basic material used in fireworks, was invented in India - *Shukranti* (shukraniti), -more than two thousand years ago - in 1242 an English monk, Roger Bacon, revealed the formula for black powder - The basic formula of the black powder, or gun powder, has remained unchanged for centuries.

C.7 Reflect your views on these questions.

- * How do you dress while lighting fire crackers?
- * Did you ever have a bad experience during lighting fire crackers? Share it with the class.
- * Do you think your parents should remain present when you light fire crackers? Why?

Language Practice

Function: Describing Process (using Imperatives)

L.1 Read the dialogue carefully.

Sharan : Mummy, can we make popcorn at home?

Mummy: Yes dear! We can make it in a few minutes. Let me show you.

Sharan : Wow, that's great! Yeyyy...Let's do it fast.

Mummy : For making popcorn, we need edible oil, corn, butter, salt and a pot.

Sharan :Do we mix the corn with oil and heat it?

Mummy :No, first of all we will take this large pot and put three tablespoons of oil in it with a kernel of corn(દાણો). Now, let's heat the oil on a high flame.

Sharan : Why did you put only one kernel of corn?

Mummy: By putting it, we come to know when to pour the rest of the corn in it. See, this kernel of corn has popped up. Now, let's pour the rest and cover the pot with a lid and reduce the flame.

Sharan :But when will you add butter and salt then?

Mummy: We need to shake the pot gently until all kernels of corn pop up. I think it's done. Give me that large bowl. We will empty the popped up corn into it and mix melted butter and salt to taste. Your popcorn is ready!

L.2 Now, read the instructions from a recipe book to make popcorn at home. Work in pairs and notice the difference in the way of showing/telling how to make popcorn in L.1 and L.2. Underline the verbs in L.2 that tell you what to do. Some are already done for you.

Popcorn is something you often eat when you watch a movie at a theatre. It is very easy to make perfect popcorn at home by following simple steps.

- Take a large pot and put three tablespoon of oil in it.
- · Heat the oil on a high flame.
- Put a kernel of corn. When it pops up, pour a quarter cup of corn and cover the pot with a lid.
- Reduce the flame and shake the pot gently until the corn has popped up.
- Empty the popcorn into a large bowl.
- Mix melted butter and salt to taste.
- L.3 (a) Complete the instructions for making *Aaloo Poha* with appropriate verbs from the box. You may use a verb more than once.

heat, roast, pick, rinse, use, keep, sprinkle, pour, add, saute, remove, allow, stir, cover, steam, switch off, garnish

[up a pan and add 2 table spoor become crunchy and keep aside.	n pea	nnuts the peanuts till they
[the	
[flame. softens the poha the flat further 4 to 5 minutes the lid coriander/cilantro leaves and grated fresh coc	me a and onut	the poha with chopped
[In the same pan or kadai, 1 tea sposplutter, 1 tea spoon (tsp) cumin the color and crackle. Then about ½ onions till they become soft.	seed	s the cumin seeds to change
[Now add the 7 to 8 curry leaves, 1 tsp chopped the roasted peanuts andw		en chilies for half a minute.
[Add the poha gently but very well sautéed potatoes. Again mix gently with the re		
[1.5 cups poha the strainer to rinse the poha the poha water. Make sure that you do not rinse it too nor rinsing, the poha absorbs enough water and is but remain intact, whole and separate. If the drops of water on the poha in the strainer. Serve aaloo-poha hot with chopped lemon pie	in the nuch the poha	or else it breaks and gets mushy. While comes soft. The poha must become soft
(b) T	he above instructions are not in the proj	per	_
V	Arra wher	naking Aaloo-Poha. Write the correct numbers and the jumbled words/phrases to make more than in the correcting a refrigerator.	eani	ngful instructions. Use capital letters
	No.	Instruction	No.	Instruction
		shelves properly wipe the drawers or and them dry let.		all food from take out the refrigerator.
		detergent mixed with clean the interior water.		switch on the refrigerator and plug the power supply.
		the refrigerator switch off and power supply unplug the.		them place back and attach properly.
		dish washing warm water soak them in mixed with soap/detergent.		drawer shelves detach.

L.4

stir-dilute washing now	der soak four-five clothe	s – half an hour dry – a	r: light/bright or o
	the clothes that you selec	, -	J
-			
3.		. Add wash	ing powder.
5			
6. Start washing each ite	em. Knead and twist the c	clothes so they get a the	orough wash.
/·			
8. Vou have got a new pho	one and you are eager to	start it Rut wait Vou	will have to fill i
	nte action words to start i		will have to fill i
V	fully ph		r accessories from
	from the top front side d		
	the SIM and		
back cover.	the charger.	_ the power supply.	
Charged' on the screen.	'Switch On' b	utton to start the phone	,
new phone is ready to use	e.		
Avni has some problem	s as listed. Write a set of	instructions for Avni	to solve her prob
using appropriate work	ds from the table. You car	n use a word more tha	n once. 🎁
8 11 1			
Shut down	Switch off	Search	Rub
	T	Search put	Rub join
Shut down	Switch off		
Shut down open	Switch off wash	put	join
Shut down open grate	Switch off wash click	put read	join dry
Shut down open grate pick up wipe	Switch off wash click run	put read insert	join dry press open
Shut down open grate pick up wipe	Switch off wash click run put it	put read insert select	join dry press open advice for solution, rub the stain, r
Shut down open grate pick up wipe Prol	Switch off wash click run put it blems n her white dress.	put read insert select Your instruction/a Wash it immediately	join dry press open advice for solution, rub the stain, r
Shut down open grate pick up wipe Prol 1. She dropped chatni of	Switch off wash click run put it blems n her white dress. ng a pen drive.	put read insert select Your instruction/a Wash it immediately	join dry press open advice for solution, rub the stain, r
Shut down open grate pick up wipe Prol 1. She dropped chatni of 2. She wants a print usin 3. Her hands are wet and	Switch off wash click run put it blems In her white dress. In a pen drive. If the phone rings. In but doesn't know how to	put read insert select Your instruction/a Wash it immediately	join dry press open advice for solution, rub the stain, r
Shut down open grate pick up wipe Prol 1. She dropped chatni of 2. She wants a print usin 3. Her hands are wet and 4. She finished working turn off the computer	Switch off wash click run put it blems In her white dress. In a pen drive. If the phone rings. In but doesn't know how to	put read insert select Your instruction/a Wash it immediately with clean water and p	join dry press open advice for solution, rub the stain, r

L.8 Prepare a list of processes that your group will pose as a challenge to the other group. One student from the group will come forward and do the action and the other group will describe it step by step. Take turns. For each successful description, the team will get 10 points.

(further details)

Sample: A student from Team 'A' will act to wash hands using soap. Team B will try to describe the process as: "Wet hands. Take soap and apply it on both palms. Put the soap back and take some water in hands. Rub the hands. Rinse them with clean water. Wipe them with a napkin."

Writing

W.1 Read the information and prepare a paragraph about Sivakashi.

A town – district Virudhunagar – Tamil Nadu –established in 15th Century during the reign of Pandya king Harikesari Parakkirama Pandian – had been a part of Madurai empire – Bhadrakali Amman Temple very famous –known for fire cracker, match sticks and printing industries – over 25000 people employed in them – has 520 registered printing industries, 53 match factories, 32 chemical factories, 7 soda factories along with a number of fire cracker manufacturers - combined estimated turnover is about 20 billion rupees - sometimes fire accidents due to negligence of safety standards

- W.2 Describe any two of these processes. You can meet/ask the concerned people or search on internet. Find out the required English words from a dictionary or take help of your teacher. [One in class, one as homework]
 - 1. Preparation of pots and other pottery items
 - 2. Preparation of any recipe (from TV show or ask your mother)
 - 3. Process of any production in your village/town/city
- W.3 You are Mr. Suresh Raval, the secretary of Royal Apartment. Draft a notice for the members of your housing society about the compulsory installation of Fire Safety Equipment in every house. (Sample is given below.)

Shree Mahatma Gandhi Vidyamandir, Anand ← (Name of the institute) NOTICE

Science Exhibition (heading/subject/event)

(date in full) 20th June, 2017
This is to inform all the students of Class IX to XII that the Science Centre of our school is organizing a Science exhibition from 7 to 9 July between 9 and 16. exhibition from 7 to 9 July between 9 am and 6 pm at the Exhibition Gallery near Babuben Parikh Hall. All the students of class IX to XII can participate in the exhibition by creating their own working-models on any topic of science subject and display them. The projects must be submitted latest by 4th July. Only the selected projects will be displayed in the Exhibition. Students can take help and guidance of their parents, friends and their science teachers in making projects. The projects can be individual or team projects.

As this exhibition is going to be visited by schools from our district, students are requested to take part whole heartedly. The last date of project submission is 4th July. For any further help or for project submission, please meet Mr. G. R. Gauswami either during the first period or during the long recess.

(Signature) Mr. P. T. Modh, ← (name) Teacher - in - Charge, Science Centre ← (designation)

W.4 Write a letter to your uncle living outside Gujarat about how you celebrated Diwali this

You may use these points: great celebration and enthusiasm in Gujarat –festival of lights lasting for five days -lamps -new clothes -fireworks -sweets and other food items -meeting and greeting relatives and friends –getting blessings from elders –missed uncle and his family a lot