GOVERNMENT OF NATIONAL CAPITAL TERRITORY DELHI
DIRECTORATE OF EDUCATION : SCHOOL BRANCH
OLD SECRETARIAT : DELHI-110054

No. DE.23 (619)/ Sch.Br./2017/ 2157 Dated: 29/09/17

CIRCULAR

Sub:- Anti Fire Crackers Campaign.

In continuation to circular No. DE.23(619)/Sch.Br./2017/2055 dated 19.09.17, DE.23(619)/Sch.Br./2017/2056 dated 19.09.17 and DE.23(619)/Sch.Br./2017/2116 dated 25.09.17 attention is once again invited to proceedings in Hon'ble Supreme Court of India in Writ Petition (Civil) No. 728/2015 regarding reaching out to children in all the Schools through the school staff, volunteers and NGOs to sensitize and educate school children on the health hazards and ill-effects of breathing polluted air, including air that is polluted due to fireworks.

In this regard, all Heads of Schools including those run by local bodies in the territory of Delhi are advised to encourage and motivate school children to reduce, if not eliminate, the bursting of firecrackers as a part of any festivities by initiating awareness programmes like **Anti Fire Crackers Campaign** on the theme '***Say No to Fire Crackers***' with the help of school staff, SMC members, parents and NGOs.

This issues with prior approval of the Competent Authority.

29.9.17

Dr. Saroj Sain
Addl.DE (Schools)

Encl: As above.

DE.23 (619)/Sch.Br./2017/ 2157 Dated: 29/09/17

All Heads of Govt., Govt. Aided, Un-Aided Recognized Schools under Directorate of Education and Schools run by local bodies through DEL-E.

Copy to:-

1. PS to Secretary (Education).
2. PS to Director (Education).
3. Commissioners (North, East and South MCD); Secretary, NDMC and CEO, DCB.
4. Dr. Sabata, Sr, Scientific Officer, with the request to help in generating awareness.
5. All RDEs, DDEs (District/Zone) for ensuring compliance.
6. Programmer (MIS) for uploading on MIS.
7. Guard File.

29/9/17

Tapeshwar Jugran
DDE (Schools)

GOVERNMENT OF NATIONAL CAPITAL TERRITORY DELHI
DIRECTORATE OF EDUCATION : SCHOOL BRANCH
OLD SECRETARIAT : DELHI-110054

No. DE.23 (619)/Sch.Br./2017/2055 Dated: 19.9.17

CIRCULAR

Sub:- Anti Fire Crackers Campaign.

With the aim to curb air and noise pollution emanating from bursting of crackers, Directorate of Education, every year, undertakes an **Anti Fire Crackers Campaign** on the theme ***'Say No to Fire Crackers'*** before the auspicious festival of Diwali. This is also in consonance with Hon'ble Supreme Court guidelines of year 2005 relating to firecrackers and addressing other problems of sound pollution and guidelines issued under Environment Protection Act 1986.

The burning of Fire Crackers during the festive season of Diwali leads to littering, smog and air pollution, noise pollution. The problem of pollution exists owing to burning of crop residues in the neighbouring states this also being the harvest season. The situation further gets worsened on the eve of Diwali festival with the bursting of fire cracker. The resultant pollution has a profound and long lasting negative impact on the whole environment which cumulatively leads to acute problems in health, especially for elderly people and children also. Furthermore, fire crackers also promotes child labour and wastage of money. Rate of fire accidents and injuries also increase alarmingly during this period.

Students being young need to be made acutely aware of the above consequences and also in their own turn need to discourage the burning of crackers in their family and community.

In the above context, all the Heads of Schools under Directorate of Education are advised to sensitize students and staff members, about the ill effects of burning firecrackers, between the festival of Dusshera and Diwali regularly as per the following schedule:

Date	**Schedule of activities and Classes/duration for which it is to be organised**			
	Primary Section	**Middle Section**	**Senior Secondary**	**Assembly**
	Activities are to be organised during 7th and 8th period only			
03.10.2017				Awareness talk on environment.
04.10.2017	Painting of Diyas			
06.10.2017		Greeting Card Making Competition		
07.10.2017			Slogan Writing Competition	
09.10.2017	Drawing Competition			
10.10.2017				Talk by teacher on Health Issues
12.10.2017		Rangoli Making Competition		
13.10.2017	Collage Making Competition		Essay Writing Competition	

16.10.2017		Kavita Path/Slogan Writing		
17.10.2017	Special Assembly (Exhibition, talk on novel ideas to celebrate diwali, debate, puppet show etc.) Special assembly shall be of longer duration. On this day duration of each period will be 5 minutes less than the normal.			

Essay Writing/Debate/Kavita Path/Slogan Writing competitions are to be organised on the topics in Hindi and English as under:

- Ways to celebrate Diwali.
- Eco-friendly and pollution free Diwali.
- Say no to firecrackers and yes to greenary/health.
- Plant a tree, not burst the crackers.
- Clean Diwali Green Diwali.
- Diwali for humanity and environment.
- Novel ways to celebrate Diwali.
- Any other related topic.

Students shall be selected on the basis of their performance in above activities and prizes for the same shall be distributed on the day of Annual Function of the school.

Students should be motivated to 'Say No to Fire Crackers' and devise safer alternatives to celebrate the festival and also to express their joy in ways which ensure compassion and happiness for others.

Eco-club of the school must take proactive role and responsibility in spreading the mass awareness through the students, parents and SMC members. SMC members should be actively involved to increase outreach in society to keep Delhi pollution free during this period.

In addition to this, Head of the School should personally address the students regularly to adopt safer measures to celebrate Diwali festival instead of using the crackers.

Also, please find enclosed a letter from Deptt. Of Environment, Govt. of NCT Delhi along with the information regarding known health impacts from bursting firecrackers caused due to their chemical composition (Annexure VII).

This issues with prior approval of the Competent Authority.

19/9/17
DDE (Schools)

Encl:As above.

DE.23 (619)/Sch.Br./2017/2055 Dated: 19.9.17

All Heads of Govt. and Govt. Aided Schools under Directorate of Education through DEL-E.

Copy to:-

1. PS to Secretary (Education).
2. PS to Director (Education).
3. All RDEs, DDEs (District/Zone) for ensuring compliance.
4. Programmer (MIS) for uploading on MIS.
5. Guard File.

19/9/17
DEO (Schools)

6/c

Department of Environment, Govt. of NCT of Delhi,
6th Level, C-Wing, Delhi Secretariat, IP Estate, New Delhi-110002
www.environment.delhigovt.nic.in
Telephone-23392028 Fax no: 23392029

No. F.9/EC/Env/2017-18/ 1364-1366 Dated. 25/08/17

To,

The Secretary
Directorate of Education, Govt. of NCT of Delhi
Old Secretariat, Delhi-110054

Sub: **Circulating of information on firecrackers for generating 'Public Awareness for firecrackers' as per the deliberations under the Writ Petition (Civil) No. 728/2015 regarding Chemical Composition of FIRECRACKERS in the Hon'ble Supreme Court – reg.**

Madam,

With respect to the above mentioned subject, Central Pollution Control Board (CPCB) has sent an information regarding health hazards of firecrackers (copy enclosed) for circulating the same to generate public awareness. It is, therefore, requested the same may be circulated to all schools and colleges (all Govt., Private, NDMC, MCDs, KVs and Delhi Cantonment Schools).

Addl DE (Sch) 15154/DE 28/8/17

Yours faithfully,

(S.M. Ali)
Special Secretary (Env.)

25/8/17

Copy to:-

1. The Director, Department of Education, Govt. of NCT of Delhi, Old Secretariat, Delhi-110054.
2. Member Secretary, Central Polluton Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032.

2002/Addl/DE/Sch 28/8/17

29/8/17

1929/DDE(Sch) 30/8/17

DDE (SCA)

MBP in Relevant file

Mr. Rohtash

67/c

ANNEXURE-VII

Known Health Impacts From Bursting Firecrackers Caused Due To Their Chemical Composition

1. **Ingredients used in FOUR commonly used sound producing fire crackers**

The Hon'ble Supreme Court of India has banned the bursting of fire-crackers or any noise generating fireworks of high decibels to control the noise pollution. The Petroleum and Explosive Safety Organisation (PESO) (formerly Dept. of Explosives – *DOE)* has identified FOUR commonly used sound producing fire crackers namely:

a. Atom Bomb
b. Chinese Crackers (no related to any country)
c. Maroons
d. Garland crackers

The focus has been on the following four ingredients - aluminium powder, sulphur, KNO_3 & $BaNO_3$.

Table 1: Usage of ingredients in FOUR common firecrackers

Ingredients	Major uses
Potassium nitrate **(Oxidizers)**	Oxidizer used as component of black powder. It is usually employed in safety fuses and lift charges
Barium nitrate **(Oxidizers)**	It can be used as oxidizer and green color agent in flames, smoke, and flash mixtures. It can produce white or silver effect with aluminium
Aluminium **(Fuel)**	It is the most widely used fuel. It produces brilliant flames and white sparks
Sulfur **(Fuel)**	Used in white and colored smoke composition, flash and sound blends. It is a component of black powder. It could also be used as oxidizer in some mixtures

2. **Chemical composition adds sparkle , colour & sound to firecrackers**

Light and Colour are important aspects of fireworks which depend on two basic physico-chemical properties:

a) Incandescence: Huge amount of heat is required to generate colour which needs instantly sets of chemical reactions within the ingredient mixture of the firecrackers. For example change of colours from red, orange, yellow, and white light as the mixture gets increasingly hot.

b) Luminescence: This feature also needs energy

Table 2: Colour producing compounds used in firecrackers

Metal & Its Compounds	Colour
Strontium Salts & Lithium Salts (Li2CO3, SrCO3)	Red
Calcium Salts (CaCl2, CaSO4.2H2O)	Orange
Incandescence of Iron or Charcoal	Gold
Sodium Compounds (NaNO3, Na3AlF6)	Yellow
White Hot Metal (BaO)	Electric White
Barium compounds with Chlorine (BaCl+)	Green

66/c

Copper Compounds and Chlorine, $Cu3As2O3Cu(C2H3O2)2$	Blue
Mixture of Strontium (red) and Copper (blue) compounds	Purple
Burning aluminium, titanium or magnesium powder	Silver

3. Chemistry of fireworks

Charcoal is the most commonly used fuel in the industry. The chemistry of fireworks is based on combustive features of the ingredients used and the lighting effects that are generated.

Based on literature survey the following are the key ingredients that go into making fireworks:

i. Fuel: Charcoal i.e. black powder is the most common fuel used in fireworks.
ii. Oxidizing Agents: The function of the oxidizing agent is to produce the oxygen needed in order to burn the mixture within the fireworks. It can be nitrates, chlorates or per-chlorates etc.
iii. Reducing Agents: It needs to burn oxygen provided by the oxidizing agents. Common reducing agents are Sulphur and Charcoal and these react with oxygen to form sulphur dioxide and carbon dioxide respectively
iv. Regulators: Metals (like aluminium, titanium, copper, strontium, barium etc.) can be added to regulate the speed of the reaction and colouring agents.
v. Binders: Binders are used to hold the mixture of the firework together in a paste like mixture. The most commonly used binder is known as dextrin, a type of starch. Paron can also be used in binding, however it is less common and only used in conjunction with red and green fireworks as it helps to enhance their colour. The binders do not actually begin to work until the firework has been lit and are potentially dangerous.
vi. Colouring Agents: Different chemicals are used to produce coloured fireworks.

Table 3 : Summary of chemicals used causing sparkling effects in firecrackers

Chemical Compounds	Purpose usage	Chemical Compounds	Purpose usage
Lead Dioxide / Nitrate / chloride	oxidizer	Aluminium	Brilliant whites
Lithium compounds	blazing reds	Potassium Nitrate	In black powder
Mercury (Mercurous chloride)	chlorine donor	Ammonium & Potassium	propellant / oxidizer
Barium Nitrate	glittering greens	Copper compounds	blues
Arsenic compounds	Used as colorants	Antimony sulfide	glitter effects

4. Non – stochiometric ingredients in firecrackers impact health

The lighting effects and noise levels depend on the chemistry of fireworks and the combustive features of the ingredients, the major concern being inappropriate stochiometric amounts of the ingredients in making common firecrackers. Firecrackers are made of chemicals/metallic agents some of which are toxic when they are burst. The major constituents of smog that forms from firecracker emissions contain SOx, NOx and significant dust load or particulate matter that may contain the any of the following

heavy metals ex. Pb, Hg, Sr, Li, Al etc. Table below provides an overview of immediate/long term effects of commonly used ingredients used in making firecrackers.

Table 4 : Environmental health Effects - Hazardous & toxic nature of ingredients used in firecrackers

Compound	Environmental health Effects
Aluminium	Contact dermatitis, bioaccumulation
Sulfur Dioxide	Acid rain from sulphuric acid affects water sources, vegetation & causes property damage.
Potassium Nitrate	Toxic dusts, carcinogenic sulfur-coal compounds
Perchlorate - Ammonium & Potassium	Can contaminate ground & surface waters, can cause thyroid problems in humans & animals
Barium Nitrate	Poisonous. Fumes can irritate respiratory tract. Possible radioactive fallout.
Copper compounds	Polychlorinated dioxins and di-benzofurans. Can bio-accumulate. Cancer risk.
Antimony sulfide	Toxic smoke, possible carcinogen
Lead Dioxide / Nitrate/Chloride	Bio-accumulation, developmental danger for kids & unborn babies, may remain airborne for days, poisonous to plants & animals
Lithium compounds	Toxic and irritating fumes when burned
Mercury (Mercurous chloride)	Toxic heavy metal. Can bio-accumulate.
Nitric oxide	Toxic by inhalation. Is a free radical
Nitrogen dioxide	Highly toxic by inhalation.
Ozone	Greenhouse gas that attacks & irritates lungs
Arsenic compounds	Toxic ash can cause lung cancer, skin irritation and wart formation.
Strontium compounds	Can replace calcium in body. Strontium chloride is slightly toxic.

References:

1. C. Martín-Alberca, C. García-Ruiz/ Trends in Analytical Chemistry 56 (2014) 27–36 ; Analytical techniques for the analysis of consumer fireworks, (Elsevier : https://www.researchgate.net/publication/260030498_Analytical_techniques_for_the_analysis_of_consumer_fireworks)
2. http://www.backcountryattitude.com/toxic_fireworks.html)

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GOVERNMENT OF NATIONAL CAPITAL TERRITORY DELHI

DIRECTORATE OF EDUCATION : SCHOOL BRANCH

OLD SECRETARIAT : DELHI-110054

No. DE.23 (619)/ Sch.Br./2017/2056 Dated: 19.9.17

CIRCULAR

Sub:- Anti Fire Crackers Campaign.

Attention is invited to proceedings in Hon'ble Supreme Court of India in Writ Petition (Civil) No. 728/2015 regarding publication of information with regard to environmental health effects-hazardous and toxic nature of ingredients used in fire crackers and circulating this information to school children. Therefore, all Heads of Un-Aided Recognized Schools are advised to initiate awareness programmes to run **Anti Fire Crackers Campaign** on the theme '***Say No to Fire Crackers***' to sensitize students and staff members, about the ill-effects of burning firecrackers, between the festival of Dusshera and Diwali.

Eco-club of the school must take proactive role and responsibility in spreading the mass awareness through the students and parents to increase outreach in society to keep Delhi pollution free during this period.

Essay Writing/Debate/Poem Recitation/Slogan Writing competitions may be organised on the following topics:

- Ways to celebrate Diwali.
- Eco-friendly and pollution free Diwali.
- Say no to firecrackers and yes to greenary/health.
- Plant a tree, not burst the crackers.
- Clean Diwali Green Diwali.
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- Novel ways to celebrate Diwali.
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Also, please find enclosed a letter from Deptt. Of Environment, Govt. of NCT Delhi along with the information regarding known health impacts from bursting firecrackers caused due to their chemical composition (Annexure VII).

This issues with prior approval of the Competent Authority.

19/9/17

DDE (Schools)

Encl: As above.

DE.23 (619)/Sch.Br./2017/2056 Dated: 19.9.17

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19/9/17

DEO (Schools)

Department of Environment, Govt. of NCT of Delhi,
6th Level, C-Wing, Delhi Secretariat, IP Estate, New Delhi-110002
www.environment.delhigovt.nic.in
Telephone-23392028 Fax no: 23392029

No. F.9/EC/Env/2017-18/4364-4366 Dated. 25/08/17

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Addl DE(Sch) 15154/DE 28/8/17

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25/8/17

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29/8/17 2002/Addl/DE/Sch 28/8/17

DDE(Sch) 1929/DDE(Sch) 30/8/17

MBFii Relevant file Rohtash

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66/c

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65/c

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2. http://www.backcountryattitude.com/toxic_fireworks.html)

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GOVERNMENT OF NATIONAL CAPITAL TERRITORY OF DELHI
DIRECTORATE OF EDUCATION: SCHOOL BRANCH
OLD SECRETARIAT: DELHI-110054

No. DE.23 (619)/Sch.Br./2017/ 2116 Dated: 25/09/2017

CIRCULAR

Sub:- Anti Fire Crackers Campaign.

This is in continuation to circular No. DE.23 (619)/Sch.Br./2017/2055 dated 19.09.2017 which is as per directions of Hon'ble Supreme Court of India in Writ Petition (Civil) No. 728/2015 regarding publication of information with regard to detrimental & hazardous effects on environment & health for all.

The aforesaid circular provides a day wise activity schedule for creating awareness. It is reiterated that on all working days, during assembly – talks and innovative activities must be undertaken involving students, staff, SMC – Members and experts/influential community members. The idea which needs to be emphasized is that each child and adult is an ***'Ambassador of Change'*** and must act as one to make the Anti Fire Crackers Campaign a success from which each one of us and our environment stands to gain.

Educational - pamphlets for celebrating pollution free Diwali will be issued shortly by SCERT. Two posters are enclosed, the content of which must be shared with all and also displayed across school at prominent places.

This issues with prior approval of the Competent Authority.

Encls: Two posters.

25/09/2017
DDE (SCHOOL)

All Heads of Govt. and Govt. Aided Schools under Directorate of Education through DEL-E

No. DE.23(619)/Sch.Br./2017/2116 Dated: 25-9-2017

Copy to:-
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3. All RDEs, DDEs (District/Zone) for ensuring compliance.
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5. Guard file.

25/9/17
DEO (SCHOOL)

प्रदूषण मुक्त दिवाली हर जगह खुशहाली

लीथियम कम्पाउंड	- जलने पर जहरीला और बेचैन करने वाला धुंआं निकलता है।
मर्करी (मक्युरस क्लोराइड)	- जहरीला हेवी मेटल। जैविक रूप में जमा हो सकता है।
नाइट्रिक ऑक्साइड	- सांस के साथ अंदर लेने पर जहरीला। फ्री रेडिकल है।
नाइट्रोजन डाइऑक्साइड	- सांस के साथ अंदर जाने पर बहुत जहरीला है।
ओजोन	- ग्रीनहाउस गैस जो फेफड़ों पर वार करता है और उन्हें बेचैन करता है।
आर्सेनिक कम्पाउंड	- जहरीले राख से फेफड़ों के कैंसर, त्वचा में जलन और मस्सा बनने का खतरा है।
स्ट्रोंशियम कम्पाउंड	- शरीर में कैल्सियम की जगह छीन सकता है। स्ट्रोंशियम क्लोराईड थोड़ा विषैला भी है।

पटाखों से होने वाले ध्वनि प्रदूषण से

- सुनने की शक्ति में क्षीणता
- उच्च रक्त चाप
- हृदय रोग
- निन्द्रा अवरोधन इत्यादि

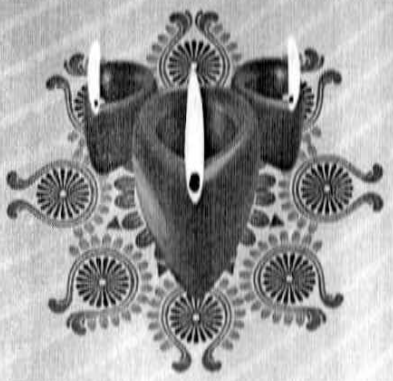
समझें और समझाऐं

पटाखों में तांबे, कैडमियम, सल्फर, एल्यूमीनियम, बेरियम जैसे खतरनाक तत्व होते है जो हवा में घुलकर उसको जहरीली बना देते है, पटाखों को जलाने से निकलने वाले धुएँ से हमारे शरीर में निम्नलिखित दुष्प्रभाव होते है।

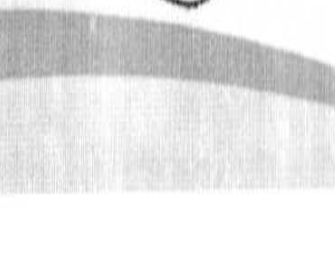
अल्युमिनियम	- संपर्क से त्वचा रोग, बायोक्युमुलेशन (जैविक रूप में जमा होना)
सल्फर डाइऑक्साइड	- सल्फ्युरिक एसीड से होने वाले एसीड रेन का जल संसाधनों, वनस्पतियों पर बुरा असर के साथ संपत्ति का भी नुकसान होता है।
पोटेशियम नाइट्रेट	- जहरीली धूल, सल्फर-कोल कम्पाउंड जिससे कैंसर हो सकता है
परक्लोरेट-अमोनियम एवं पोटाशियम	- जमीन के नीचे और ऊपर के पानी को प्रदूषित कर सकता है। मनुष्यों और जंतुओं में थायराइड की समस्या पैदा कर सकता है।
बेरियम नाइट्रेट	- जहरीला, इसका धुंआ सांस नली में बेचैनी पैदा कर सकता है। रेडियोएक्टिव दुर्घटना की भी संभावना है।
कॉपर कम्पाउंड	- पॉलीक्लोरिनेटेड डायऑक्सीन और डाई-बेंज़ोफुरान्स। जैविक रूप में जमा हो सकता है। कैंसर का खतरा पैदा कर सकता है।
एंटीमनी सल्फाइड	- जहरीला धुंआ, कैंसर कारक है।
लेड डायऑक्साइड/ नाइट्रेट/क्लोराईड	- जैविक रूप में जमा हो सकता है। नाइट्रेट/ क्लोराइड पेट में पल रहे बच्चों के विकास के लिए खतरनाक हो सकता है कई दिनों तक हवा में मौजूद रह सकता है, पौधे और जंतुओं के लिए जहरीला।

सुन्दर सुरक्षित हमारी धरती, इसकी हालत हमने क्या कर दी।

इस दिवाली पटाखे न जलायें, धरती को पुनः हरित बनायें।



खुशियों की रोशनी
अपनों का प्यार
झूम उठी धरती
और किया दुलार
जब बिना पटाखे मनाया
हमने दिवाली का त्यौहार



"पटाखे नहीं जलाऐंगे पर्यावरण को बचायेंगे"

GNCT OF DELHI
शिक्षा निदेशालय
राष्ट्रीय राजधानी क्षेत्र
दिल्ली सरकार

SCERT
स्वाध्यायान्मा प्रमदः
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State Council of Educational Research and Training