

SECTION-A BASIC DESCRIPTION OF THE CHAPTER

Name of the school	Govt. Model Sen. Sec. School Sheron (Sunam) Govt. Model Sen. Sec. School Lehalkalan (Lehragaga)
Name of the Teacher	Mrs. Sarbjeet K. Mrs. Gagandeep K.
Class	8 th
Subject	Science
Name of the chapter	Synthetic fibers and Plastics
No. of periods	8 periods

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SECTION-B OBJECTIVES/EXPECTED LEARNING OUTCOMES

B1. CONCEPTS:-

1. Synthetic fibres
2. Natural fibres
3. Types and sources of fibres
4. Characteristics of synthetic fibres
5. Types of plastics
6. Plastics are poor conductors of heat and electricity
7. Characteristics of plastics
8. Biodegradable and non biodegradable plastics
9. Plastics and the environment

B2. USEFULNESS IN DAILY LIFE

Students will learn about

- Polymerization
- The types of fibers
- Manufacturing of fibers
- Fibres used in clothes which we wear in daily life
- Sources of fibres
- Synthetic fibres used in daily life
- Biodegradable/Non biodegradable materials
- Recycling of plastics
- Pollution caused by the plastics

Without learning this concept students will not understand

- The difference between natural & synthetic fibres
- Types of fibres used for our clothes
- The tensile strengths of fibres
- Plastics and the environment

This knowledge is helpful in: Textile industry, Dye making, synthetic material production, building and construction, packaging, and transportation, polymer industry etc

B3 LIFE SKILLS:

- Establish relation with daily life
- Research Aptitude
- Team Work
- Creative Art
- Creative Writings
- Presentation skills

B4. Vocabulary

- Synthetic
- Natural
- Artificial
- Elastic
- Rayon
- Nylon
- Polyester
- PVC
- Acrylic
- Bakelite
- Melamine
- Petrochemicals
- Durable
- Polythene
- Thermoplastics
- Thermosetting plastics
- Strength
- Tensile strength
- Conductors
- Biodegradable
- Non biodegradable
- Recycle
- Reduce
- Reuse
- Recover

Section C: -BUILDING BRIDGE: - As students go through the topic in the class teacher will ask following questions.

- 1) What are Fibres ?
- 2) What are Natural Fibres?
- 3) Give some examples of Natural Fibres?
- 4) Where we use these Natural Fibres?
- 5) Make a list of articles made from fibres.

SECTION D. PERIOD WISE BREAK UP FOR THE CHAPTER:

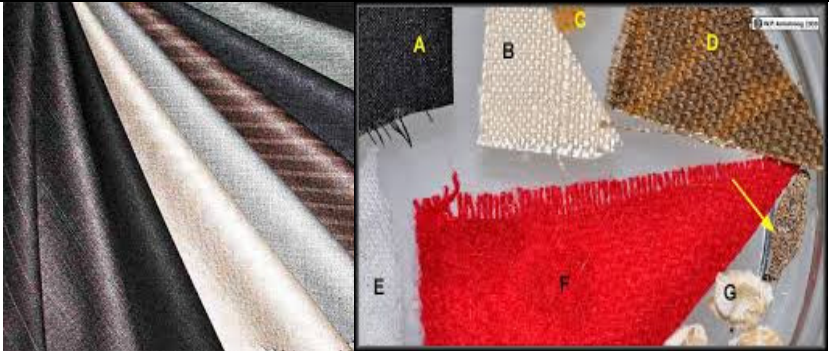
Periods	What to be covered
1.	Introduction, Previous Knowledge testing, Activity GA-I, career options, Q/A session, home task.
2.	Types of synthetic fibres, related activities, Q/A session, Home task.
3.	Characteristics of synthetic fibres, related activities, Home Task, visit to lab.
4.	Plastics, types of plastics, plastic as a material of choice, activity, home task
5.	Videos, discussion about recycling of material, home task, visit to smart class room.
6.	Slogan Writing, home task
7.	Student presentation
8.	Recapitulation

SECTION E. MICRO PLANNING/MINUTE TO MINUTE BREAK UP OF PERIODS.

Sub section E.1 Minute to Minute break up of period 1.

Concept	Time	Indicative/guiding script
Introduction	15 min.	Perform activity to show different stuff of clothes. Refer to <u>annexure GA1</u> Talk about natural and synthetic fibres. Ask students to give any example of synthetic fibres.
Explanation of concept	10 min	Teacher will explain the process of polymerization by showing a necklace of beads. Talk about natural and synthetic polymers. 
Career options	5 min.	Teacher will talk about various career options to students. For details refer to section B2.
Q/A session	5 min.	1. What are synthetic fibres? 2. Name the type of fibre of your uniform? 3. Give any one example of synthetic fibre?
Home task	5 min.	Check different clothes in your home and make a list of articles made from fibres. Try to separate them in to natural or synthetic fibre.

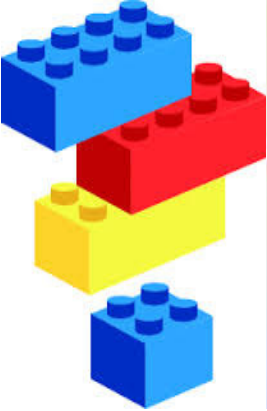
Annexure GA1 Performa for giving details about an activity

Annexure Name	GA1
Name of the activity	Show different kinds of clothes
Type of the activity(individual activity/ group activity / home activity etc.)	Demonstration by teacher
Objective	To introduce the chapter and check previous Knowledge of students.
Material required for the activity	Collection of different kinds of clothes
Any specific preparations required in the class room for performing the activity	Teacher will bring different cloth materials
Details of the activity and detailed instructions to carry it out	Collect samples of various types of clothes. Paste it on a chart paper. Feel them with touch & identify as cotton, silk, nylon etc.
Pictures describing the activity, if any	
Any precautions to be kept in mind	NA
Explanation of the outcomes of the activity	To differentiate between natural & synthetic fibres

Sub section E.2: Minute to Minute break up of period 2

Discussion about home assignment	10 min.	Teacher will ask the questions from students about fibres of their Clothes which are at their home. 1. What type of clothes do you wear in this season? 2. Give some example of clothes which has been made from natural and synthetic fibres? Teacher will discuss with students what they answered.
Types of Synthetic fibres	5 min.	Activity to showing different synthetic fibres (refer to an annexure <u>GA2</u>)
Discussion about types of fibres	20 min.	Teacher will explain the types of Synthetic fibres one by one. Rayon -is known as artificial silk. It is cheaper than silk It can be dyed in variety of colors. Uses:- It is used to make bedsheets, carpets etc. NYLON - prepared from coal, water and air. It was first fully synthetic fibre. It is strong and light weight. Uses: - Used to make socks, ropes, tents, toothbrush, car sheets, bags etc. TERYLENE -Popular example is polyester, Its fibres can be woven like yarn. Uses:- Used to make bottles Utensils, films, wires etc. ACRYLIC -It resembles to natural wool. Cheaper than natural wool More durable and affordable than natural wool. Uses:- to make shawls, sweaters, blankets etc
Q/A Session	5 min.	1. Name the different types of synthetic fibres? 2. What is the use of Nylon? 3. Name the fibres from which ropes and tents are made? 4. What is artificial silk? 5. What are petrochemicals?
Home task		Collect the pieces of different kinds of clothes which you find in your home.

Annexure GA2 Performa for giving details about an activity

Annexure Name	GA2
Name of the activity	Types of synthetic fibres
Type of the activity(individual activity/ group activity / home activity etc.)	Demonstration by teacher
Objective	To know about the fibres which they use in daily life
Material required for the activity	Chart based on synthetic fibres
Any specific preparations required in the class room for performing the activity	Teacher will prepare the chart
Details of the activity and detailed instructions to carry it out	*Collect samples of various types of clothes made from synthetic fibres. *Paste it on a chart paper & label them. *Explain the name & type of synthetic fibres.
Pictures describing the activity, if any	 RAYON  NYLON  TERYLENE  ACRYLIC
Any precautions to be kept in mind	NA
Explanation of the outcomes of the activity	Name & types of synthetic fibres

Sub section E.3: Minute to Minute break up of period 3:

Introduction and lab settings	5 min.	Teacher will set the apparatus and introduce the topic to students, Characteristics of synthetic fibres and will collect the pieces of clothes from students.
Activity	15 min.	Perform activity “ burning of different fibres” (<u>refer to annexure GA3</u>) Teacher will ask the students to smell the burning of fibres .
Activity	15 min.	Perform activity “ to study the tensile strength of fibres” (refer to <u>annexure GA4</u>) Teacher will ask to the students to arrange the different fibres according to their strength.
Home task	5 min.	Make a list of objects you use in your daily life and the material used in making these objects.

Annexure GA3 Performa for giving details about an activity

Annexure Name	GA3
Name of the activity	Burning of different cloth materials
Type of the activity(individual activity/ group activity / home activity etc.)	Demonstration by teacher
Objective	Students will understand the burning characteristics of fibres
Material required for the activity	Different clothes, burner
Any specific preparations required	Pieces of different clothes brought by the students
Details of the activity and detailed instructions to carry it out	* Teacher will collect the pieces of clothes from the students. * Burn one by one carefully. * Check the smell of each fibre
Pictures describing the activity, if any	
Any precautions to be kept in mind	Students will perform the activity in the supervision of the teacher
Explanation of the outcomes of the activity	Types of fibres & their burning incense

Annexure GA4 Performa for giving details about an activity:

Annexure Name	GA4
Name of the activity	To study the tensile strength of fibres
Type of the activity(individual activity/ group activity / home activity etc.)	Student & Teacher based
Objective	Understand the concept of strength of fibres
Material required for the activity	Threads of cotton, wool, silk, nylon of same length & thickness
Any specific preparations required	Different weights are needed
Details of the activity and detailed instructions to carry it out	* Take threads and hang one of them from a stand. * Attach a pan at the other end. * Add weights one by one to the pan until the thread breaks. * Note the total weight required to break the thread. * Repeat the process with other threads & compare their strength.
Pictures describing the activity, if any	NA
Any precautions to be kept in mind	Students will perform the activity in the supervision of the teacher
Explanation of the outcomes of the activity	Tensile strength of the fibres.

Sub section E.4: Minute to Minute break up of period 4:

Discussion about home Assignment and introduction of the topic	5 min.	Teacher will ask the students about the list of different house hold objects which we use in our house for different purposes and the material from which they are made. 1. What do you observe from this list? 2. Teacher will tell the students that most of the material is made up of plastics. Teacher will introduce the topic “Plastic, types and uses”.
Explanation	5 min.	Teacher will explain *About the plastic *It is also a polymer like synthetic fibres. *It is light weight, strong and durable, cheap, easy to handle, non corrosive, strong, easily available ,non reactive towards air and water, poor conductor of heat and electricity
Discussion about Types of plastics	20 min.	* Perform the activity based on thermoplastic and thermosetting plastics (refer to <u>annexure GA 5</u>) * In above activity, the shape of the bottle gets changed when we add very hot water in it. Such plastic which gets deformed easily on heating and can be bent easily are called thermoplastics. Examples- Polythene, PVC (Poly Vinyl Chloride) etc. Uses:- Making toys , combs, containers, bottles etc. The plastic which when molded once, can t be softened on heating called thermosetting plastic. They are poor conductors of heat and electricity. Melamine resists fire Examples :- melamine, Bakelite Uses :- Floor tiles, kitchen wares and electrical switches etc.
Plastic as a material of choice	5 min.	* Light weight * Lower price * Good strength * Easy handling * Non reactive * Poor conductor of heat.
Home task	5 min.	Prepare an assignment on “plastic as a material of choice”.

Annexure GA5 Performa for giving details about an activity

Annexure Name	GA5
Name of the activity	Thermosetting & Thermoplastic differences
Type of the activity (individual activity/ group activity / home activity etc.)	Teacher student based
Objective	Co-relation of concept with daily life
Material required for the activity	Plastic bottle, polythene, floor tile, plate made of plastic, water pipe, burner
Any specific preparations required	Collection of different plastic materials
Details of the activity and detailed instructions to carry it out	* Take a plastic bottle. * Take some water in a beaker and heat it. * Now put the water in the plastic bottle. * Observe the change in the shape of water bottle. * Repeat this activity with other plastic items one by one and observe the change.
Pictures describing the activity, if any	
Any precautions to be kept in mind	Students should perform the activity only in the supervision of the teacher
Explanation of the outcomes of the activity	Concept of thermosetting & thermoplastic

Sub section E.5: Minute to Minute break up of period 5:

Introduction	5 min.	Teacher will take the students in the smart class room and introduce The topic “ Biodegradable and non biodegradable substances ”.								
Videos	15 min.	Teacher will show the videos about biodegradable and non biodegradable substance (refer to https://www.youtube.com/watch?v=V5659YeQ1yI)								
Discussion about recycling of material and Home Assignments	20 min.	*A material which gets decomposed through natural processes is called biodegradable. A material which is not easily decomposed by natural processes is called non-biodegradable. Non biodegradable substances take several years to decompose. * Avoid overuse of plastic * Use biodegradable substances * Follow 4R principle *Reduce * Reuse *Recycle * Recover Make a chart about different types of waste, their time to degenerate etc as shown in the following format. <table><tr><th>Type of waste</th><th>Approx. time to degenerate</th><th>Nature of the material</th></tr><tr><td>e.g. paper</td><td>10 to 30 days</td><td>biodegradable</td></tr></table>			Type of waste	Approx. time to degenerate	Nature of the material	e.g. paper	10 to 30 days	biodegradable
Type of waste	Approx. time to degenerate	Nature of the material								
e.g. paper	10 to 30 days	biodegradable								

Sub section E.6: Minute to Minute break up of period 6:

Group activity Slogan writing	35 min.	Teacher will divide the class into 5-6 groups. (refer to annexure SWA) • Arrange a campaign about “say no to plastic”. • Each group will make different slogans on above theme. • Teacher will supervise them.
Home assignment	5 min.	Teacher will give different topics to each group for presentation. • Say no to plastics • Avoid plastic as far as possible • Limitations of plastics • Why plastic bags are banned by government • Effect of use of plastic in every day life.

Annexure SWA Performa for giving details about an activity:

Annexure name	SWA
Name of the activity	Slogan writing competition
Topic	Slogan writing on avoid the use of plastic, say no to plastics, etc.
Type of activity	Individual activity
Material required	Drawing sheets, colors etc.
Details of activity	Teacher will distribute the drawing sheets to students and announce the topics and will give instructions.
Picture describing the activity	
Outcomes	CREATIVE art skill
Objective assessment	Teacher will assess the creativity and their knowledge about concept.

Sub section E.7: Minute to minute break up of period 7:

Student presentation	25 min.	Teacher will give 3-4 min. to each group. * Teacher will randomly choose 2 students from each group to make their presentation. * Teacher will note down the performance and would point out positives of each presenter and guide with regard to the deficiency.
Home task	15 min.	Teacher will talk about good points of students and areas where improvement can be done. Prepare an activity book of the all activities that we have done in this chapter.

Sub section E.8: minute to minute break up of period 8:

Recapitulation	35 min.	Brief discussion about the whole chapter with students
Home task	5 min.	Read the next lesson metals and non-metals.

SECTION-F:

Page no. 32 to 43, Chapter 3, NCERT, Class 8th Science text book.

- Useful Online resources
- [http:// www.pslc.ins/macrog/index.htm](http://www.pslc.ins/macrog/index.htm)
- [http:// www.edugreen.teei.res.in/exploresolinaste/types/htm](http://www.edugreen.teei.res.in/exploresolinaste/types/htm)
- [http:// www.packagaintoday.com/](http://www.packagaintoday.com/)
- [http:// www.bbc.co.uk/schools.gcsebitesize/design/testiles/fibreteev](http://www.bbc.co.uk/schools.gcsebitesize/design/testiles/fibreteev)

Section G. List of possible activities.

Name of the concept/ skill/ outcome	Name of the possible activities	Reference of the annexure where the detail of the activity have been given in the already specified format or reference to the web address.
A. Introduction to the chapter.	1. Show different types of clothes.	Refer to <u>annexureGA1</u>
B. Sensitization about various career option	Encouraging about various career option.	http://www.highereducationinindia.com
C. home task	*Observe different Kinds of clothes. *Collection of pieces of clothes. *List of objects, materials from which they made. *Assignment on *Plastics as a materials of choice. *Chart on waste material. *Preparation of an activity book	<u>Refer to section E, period 1.</u> Refer to section E, period 2. Refer to section E, period 3. Refer to section E, period 4. Refer to section E, period 5. Refer to section E, period 7.
D. concept 1	Different types of synthetic fibres.	<u>Refer to annx. GA2</u>
E. concept 2	Burning of different cloth material.	<u>Refer to annx. GA3</u>

F. concept 3	To study the tensile strength of fibres.	<u>Refer to annx. GA4</u>
G. concept 4	Activity based on thermoplastics and thermosetting.	<u>Refer to GA5</u>
H. team skills/ research	Group discussion/presentation.	Refer to section E, period 5, home task.
I. Creativity	1. Slogan writing competition 2. Chart making	<u>Refer to SWA</u> <u>Refer to section E, period 5, home task.</u>
J. presentation skill	Lecture by students on different topics	<u>Refer to section E, period 7.</u>
K. vocabulary	Difficult words given to students	<u>Refer to section B.4</u>

Section H. MODEL ASSESSMENT TOOLS FOR THE STUDENTS

FOR FAs: - On the basis of different activities done in this chapter

FOR SAs

1. Explain why some fibres are called synthetic fibres?
2. Why should not we wear nylon clothes while working in the kitchen?
3. Explain why plastic containers are favored for storing foods.
4. Explain the difference between thermoplastic and thermosetting plastics?
5. Why are plastics considered better than other materials?
6. What are the limitations of using plastics?
7. What is polymerization?
8. Why recycling is the best way of disposal of the plastic wastage?
9. Manufacturing synthetic fibres is actually helping conservation of forests. Comment ?
10. What are the limitations of Rayon?
11. What are 4 R principles?
12. What is the need for synthetic material?
13. Mention two disadvantages of synthetic fibres?
14. Describe an activity to show that thermoplastic is a poor conductor of electricity?
15. Why it is advisable to use cotton clothes in summer?
16. Do synthetic fibres soak less or more water than the natural fibres?
17. Do synthetic fibres take less or more time to dry as compared to natural fibres?
18. Why does bakelite is used for making electrical switches?
19. What type of material is used in lunch boxes ?
20. Why does nylon fibres are used to make rock climbing ropes?
21. What kind of material is used to make umbrella used in rainy season?
22. Why does handles of frying pans are made of plastics?

23. Why does plastic is used in packaging of tablets and medicines?
24. Why should we use cotton bags or jute bags instead of plastics bags while shopping?
25. Explain why the followings are made up of thermosetting plastics
- A) Saucepan handles
 - B) Electric plugs
26. Why does rayon appear like silk?
27. Samir wants to buy shirts for summer. Should he buy cotton shirt or shirt made from synthetic material? Advise Samir giving your reasons.
28. Define thermoplastics and thermosetting plastics.
29. What is the full form of PVC?
30. What is polythene? What are its uses?
31. Match the term column A correctly with phrases given in column B.

A	B
1. Polyester	a. Prepared by using wood pulp
2. Teflon	b. Used for making parachutes
3. Rayon	c. Used to make non stick cook ware.
4. Nylon	d. Fabrics do not wrinkle easily.

32. Synthetic fibres are also called _____ or _____ fibres.
33. Like synthetic fibres, plastic is also a _____.

34. Give examples to show that plastics are noncorrosive in nature.
35. Why does polyester fibre quite suitable for making dress material?
36. How you distinguish natural fibre and synthetic fibre?
37. Explain 4R principle.

SECTION- I

1. Why does nylon fibre is used to make parachutes?
2. Explain why chemicals are not stored in plastic containers?
3. Why Teflon is used for non stick coating on cooking wares?
4. Why does the uniform of firemen have coating of melamine plastic?
5. Disposal of plastic is a major problem .why?
6. What are petro chemicals?
7. What raw materials are used to make petrochemicals?
8. What is the use of plastic in health care industry?
9. Why does heat in micro wave oven not damage the plastic vessels?
10. What are the three FIBRE-WISE attitudes to keep public places clean?
11. What are the consequences one has to face eating in plastic containers?
12. Manufacturing synthetic fibres is actually helping conservation of forest comments.
13. Why plastic containers are favoured for storing food?
14. Give difference between thermoplastics and thermosetting plastics.
15. What are monomers present in 1. Polythene 2. Terylene 3. Nylon 4. PVC 5. Bakelite
16. Give some names of biodegradable polymers.

17. Fibre obtained by chemical treatment of wood pulp is called
- Natural silk
 - Rayon
 - Nylon
 - Polyester
18. Nylon is obtained by _____
- Treating wood pulp
 - Solidifying water
 - Mixing coal, air and water
 - Mixing chemicals
19. _____ is stronger than steel wire.
- Cotton fibre
 - Silk thread
 - Plastic thread
 - Nylon fibre
20. In what ways the synthetic fibres pollute the environment. Explain with example.
21. What properties of plastics make it user friendly?
22. What are bad effects caused by the plastics
24. What is the role of cross linked long chains in thermosetting plastic?
25. Give polymerization of at least two thermoplastics.
26. What is Nylon-6,6?
27. Why Nylon is considered as Fibre?
28. Compare properties of synthetic and natural fibres
29. Define 1. Monomers 2. Polymers 3. Homopolymer 4. Copolymer
30. What are Esters ? Give their chemical formula.
31. Polymers are always macromolecules but macromolecules are not polymers.
Comment.
32. Name a polymer occurs naturally?
33. Although rayon is obtained from a natural source, wood pulp, yet it is a man-made fibre. Why?
34. Why does Nylon become very popular for making clothes for mankind?
35. Why does polyester fibre quite suitable for making dress material?
36. Name the chemicals used in formation of polyester.