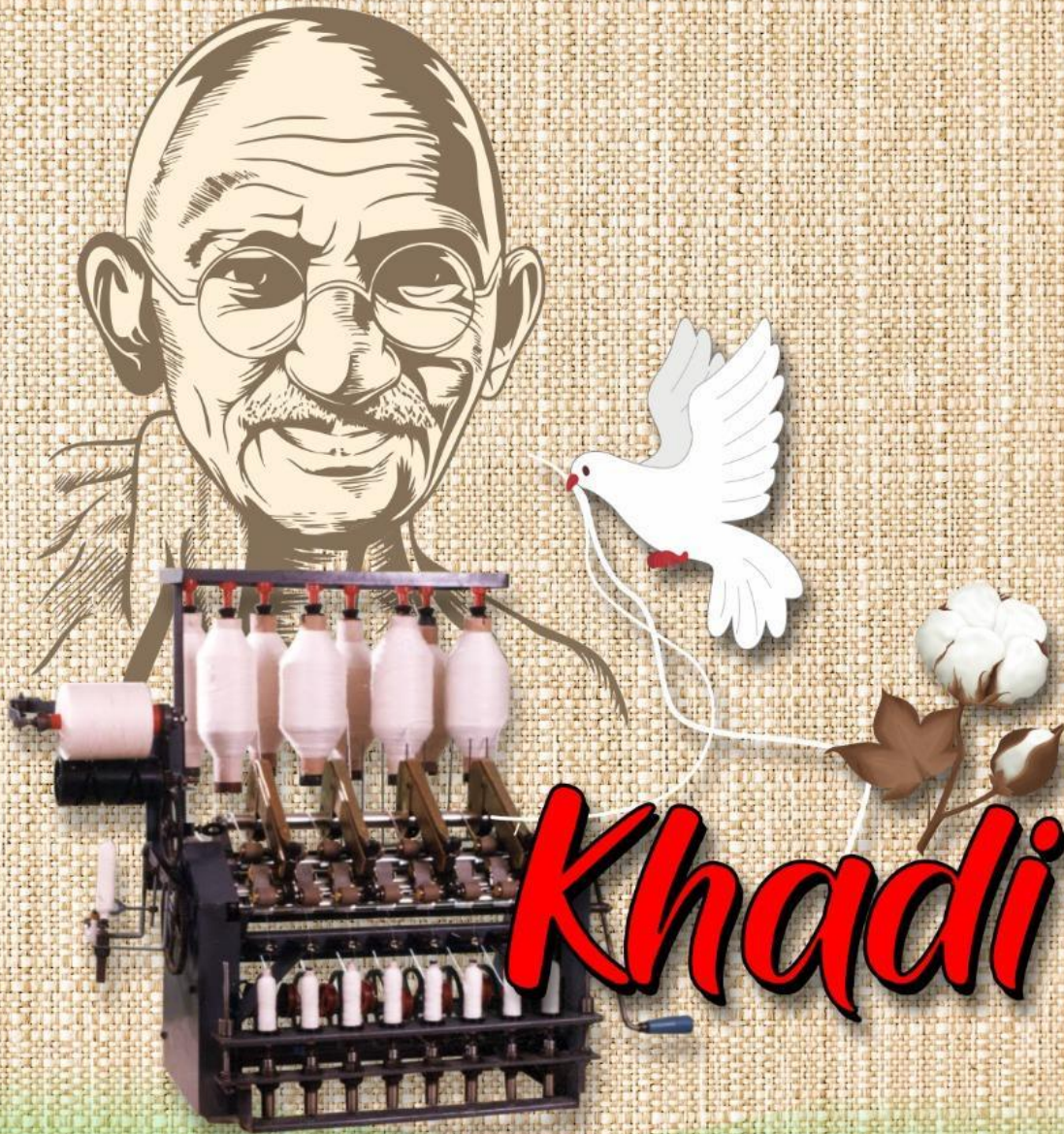




SKILL MANUAL

CLASS VII



Khadi



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ACKNOWLEDGEMENTS

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COLLAGE



FOREWORD

We cannot always build the future for our youth, but we can build our youth for the future.”— Franklin D. Roosevelt

With an aim to overcome the social status hierarchy associated with Skill(Vocational) Education, the NEP 2020 has recommended integration of Skill Education Programme in mainstream education in all the educational institutions and exposing students at early ages to quality Skill Education through the middle and secondary school and smooth integration into higher education/vocation. The world of academia has an important responsibility to meet the requirements of the practical world and prepare students with the knowledge and skills that they require to adapt to the new world order. In this direction, it is prudent to expose them to such concepts early on their educational journey. This handbook on ‘Khadi’ is a step in this direction. This Khadi manual aims to introduce students to the world of textiles, primarily Khadi and its importance through hands-on activities. Khadi is very closely associated with India’s freedom movement and it’s a matter of pride for every Indian. The underlying thought behind creating this manual is to help young learners explore traditional as well as modern textiles along with its scientific understanding. We would like to congratulate Dr. Jyoti Gupta(Director Principal, K.R Mangalam World School, G.K-II), Princess Diya Kumari Foundation for their constant support to accomplish the project successfully. We would also like to thank all members of team who worked towards completion of this manual. Due care has been taken to keep the book content simple and easy to understand. The progression of topics too is carefully designed as it transitions from the most fundamental concepts of Khadi in a guided manner. We sincerely hope that the handbook is well received by the students, and they can leverage the learnings provided therein. Any suggestions for the improvement of the book are welcome.

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UNIT-1

DEVELOPMENT OF KHADI AND ITS SCOPE



Learning Objectives

1. Learners will trace the history of Khadi development in India.
2. Learners will use the scope of Khadi for their personal skill development.

Learning Outcomes

- A. The learners will be able to relate and reflect the importance and research about the developments of Khadi in the Indian Economy.
- B. The learners will be able to identify the raw material and how to weave the thread obtained from pooni?
- C. The learners will be able to compare the scope of making Khadi and its employability as compared to other vocational subjects.

Development of Skills and Competencies -

1. Effective Communication and Citizenship.
2. Knowledge and thinking skills.

INTRODUCTION

The Indian heritage of khadi is only a cloth woven by hand using hand spun yarn only. Khadi is not just a piece of cloth for Indians, it represents eternal sentiments of every Indian.

The Khadi movement by Gandhiji aimed at boycotting foreign goods and promoting Indian goods, thereby improving India's economy. Mahatma Gandhi began promoting the spinning of Khadi for rural self-employment and self-reliance (instead of using cloth manufactured industrially in Britain) in 1920s, thus, making Khadi an integral part and icon of the Swadeshi movement. The freedom struggle revolved around the use of Khadi fabrics and the dumping of foreign-made clothes

Manufacture of khadi fabrics is considered to be heritage based production activity. Being based on human skill, it provides livelihood to a large section of population. Although heritage based technologies have longer life compared to science-based technologies, they face challenges on and off.

Development of khadi is a critical component of the strategy to achieve a balanced and integrated development. This segment is an important link not only to the informal economy, but it also fosters skills, promotes entrepreneurship at a micro level and is integral to our growth process.

Khadi is environment friendly. It provides jobs to millions of people. With upgradation of skills and quality of khadi products, it can be marketed globally. The use of Khadi as a cloth, incorporates a distinct character.

It is crisp like cotton material or supple like its silk counterpart. It accommodates print and embroidery in its own distinctive vogue, giving varied decisions to designers to choose between blends and elaborations that complement their sensibilities.

Facts to know about Khadi:

1. Khadi was earlier used in National Flags.
2. Khadi is extremely environmental friendly.
3. 70% of khadi weavers are women
4. No two Khadi fabrics will be identical, thus it's an exclusive fabric!
5. It is the fabric of the 'Swadeshi Movement'
6. Khadi is cool in summer and warm in winter.
7. It enables full development of locally available raw materials and human resources.

SCOPE OF KHADI



Fig 1.1 Weaving Khadi

Source: weave-weaving-loom-textile-handmade-craft-vintage-446463

Production of Khadi fabrics encourages self-employment and the constructive development of weaker sections of society. Spinning is easy to learn and requires low capital. It is one of the best ways to boost the economy of rural India and advance towards a green economy and self-reliance.

The majority of the workforce in the textile industry are women and hence, empowering indigenous khadi fabrics can provide a stable livelihood to women across-the-board.

The demand for Khadi is increasing rapidly. Indian Government is making continuous efforts to further grow the Khadi sector in all the states of India. A vast population is expected to gain self-employment opportunities in the coming years.

Khadi Reform and Development Programme (KRDP) KVIC (Khadi and Village Industries Commission) launched Khadi Reform and Development Programme (KRDP) in 2014, which aims to revive the Khadi sector with enhanced sustainability of khadi, increased incomes and employment for spinner and weavers, increased artisans' welfare and to achieve co-operation with village industry. The main focus of this scheme is on the re-positioning of Khadi and linking to market requirements, providing selective subsidy and enhanced remuneration. KRDP is implemented with assistance from Asian Development Bank (ADB) include setting up of a Marketing Organisation under Public Private Partnership (PPP) to promote Khadi sector.

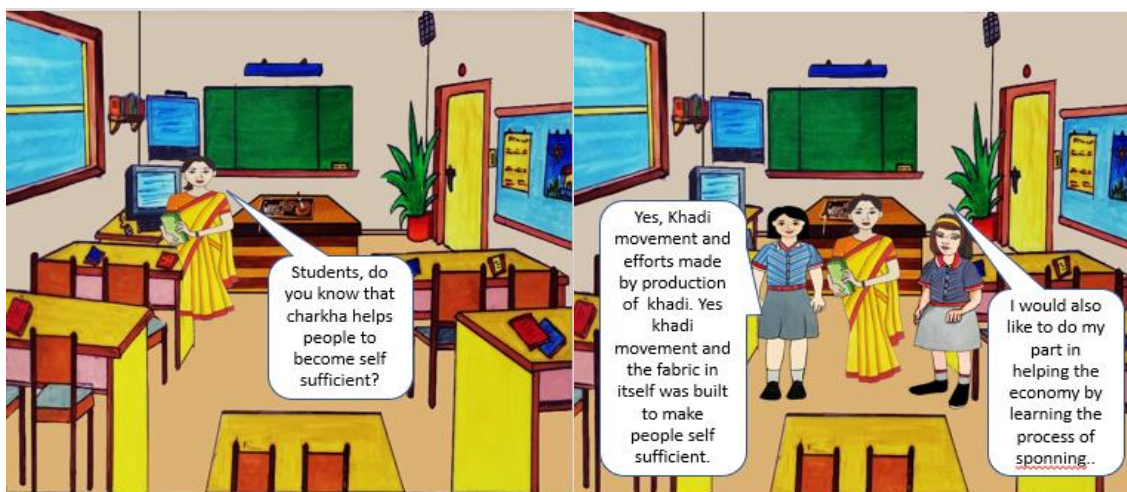
https://www.kvic.gov.in/images/KHADI_English_Compress.mp4

Learning Engagements

1. What is KVIC ? Briefly explain the locations in India.
2. Explain the scope of Khadi.

UNIT - II

The Story of Khadi making



Learning Objectives

1. Learners will study and conclude the stages of cotton crop production.
2. They will describe the processing of cotton fibres into yarns.
3. Learners will be acquainted with the processes involved in rearing of silkworms and making of silk fibres.

Learning Outcomes -

1. Learners will be able to identify and describe the processes involved in Khadi making from spinning the yarn to weaving.
2. They will be able to identify the properties of Khadi as a cloth.(Good for both summers and winters).

Development of Skills and Competencies -

1. Effective Communication and Citizenship.
2. Knowledge and thinking skills.

The Khadi making Process –

The process of khadi making involves collection of cotton bolls from the fields and removal of dirt and other contaminants

Ginning/Cleaning- This involves the separation of cotton fibres from the seeds. This can be done by hands with small driven equipment called 'Otni" or in factories having power driven roll-gins.

Carding/Silvers- It enhances the spinning process as it involves the final cleaning of cotton by removing the left over impurities.

Warping- Warp and weft are used for weaving yarn into fabric. The ends of the warps are arranged in a parallel order and length depends on the length of the cloth to be woven.

Weaving- The process of weaving basically involves continuous intersecting of weft with the warp, in some form of over and under crossing of yarn, to be converted into cloth.

Packing and Marketing:

Cotton khadi is folded and then a label with the price, necessary information regarding the length, width, texture, count of yarn used, retail price, name of the producing institution and year of production is put up. Finally, the khadi pieces are packed in bags for transportation.

Making of Khadi Silk

Sericulture or Silk Farming is the cultivation of silkworms for producing silk.

The production stages are as follows:

- The female silk moth lays 300-500 eggs.
- The eggs hatch to form larvae or caterpillars known as silkworms.
- These larvae feed on the mulberry leaves and grow and molt several times.
- The silkworm extrudes silk fibre and forms a net to hold itself



Fig 2.1 - Life Cycle of a Silk Moth

<https://www.flickr.com/photos/76798465@N00/430739001>

- The silkworm spins a filament around itself and encloses into a cocoon in two-three days.
- The cocoons are boiled, killing the silkworm pupa and then the silk is obtained from the undamaged cocoons.

Types of Moths



Fig 2.2 - Mulberry Silk Moth

Source: https://commons.wikimedia.org/wiki/File:Paracles_argentina.jpg



Fig 2.3 - Tussar Silk Moth

Source: <https://pixahive.com/photo/a-butterfly-7/>



Fig 2.4 - Eri Silk Moth

Source: <https://www.needpix.com/about>

Ahimsa Silk or Peace Silk

The Sanskrit term ‘Ahimsa’ means non-violence and is well associated with Gandhiji. We rarely think of clothes as threatening or violent, especially for something so gorgeous as silk.

We have learnt that silk is a natural animal-source fibre. The silkworms spin cocoons around themselves. These threads of cocoons are silk, which are at their highest quality before an adult moth breaks out. To ensure quality, in traditional extraction techniques - silkworm pupae are mass killed, after which cocoons are boiled.

Ahimsa Silk is extracted by a process claimed to being ‘Ahimsak’ or non-violent. This process does not involve mass boiling of silkworm cocoons. This is a gentler method, where silkworm pupae are moved out of their cocoons before silk yarn (Ahimsa Silk) spinning.



Fig 2.5 - Ahimsa Silk Making

The pupa may be allowed to hatch naturally or the cocoons are manually cut open, so the pupa emerges out.

Source: <https://www.needpix.com/about>

Post-learning Engagement:

Research and find out about the different types of silk and the major silk producing states in our country.

Learning Engagement:

Collect swatches of Khadi silk and make any article of your choice - bows, head bands, coin pouch, bag pockets, etc.

UNIT- III

KHADI SILK AND ENVIRONMENT



Learning Objectives-

Learners will

- a. Determine the advantages of Khadi silk over other types of silk.
- b. Discover and correlate sustainability of Khadi silk.

Learning Outcomes

Learners will be able to

- a. Differentiate between Commercial silk and Khadi silk.
- b. Identify the Khadi silk from its properties.
- c. Establish the sustainable nature of Khadi silk and its products.

Introduction:

Gandhiji called for a boycott of British textiles to embrace the ancient craft traditions of our own country, the foremost being Khadi. Technically, Khadi can be referred to any natural fabric that is hand-spun and handwoven, be it silk, jute or wool. Khadi is a precious craft, deeply intertwined with India's story. More importantly, it is highly sustainable.

Historically, Khadi played a role in helping India free itself from the rule of its colonisers. Today, it is a part of the solution for the major environmental crisis that the world is facing. With sustainable fashion now becoming part of mainstream conversations, Indian consumers have become open to embracing clothing made out of eco-friendly raw materials. Thus, various organisations, brands and designers are giving this humble fabric, a modern makeover to keep it relevant in 2020. In fact, in the last few years, the textile has made incredible strides both commercially and aesthetically.

The spinning of khadi uses no machines or energy and thus, has a low carbon footprint. A metre of khadi fabric consumes three litres of water, while one metre of mill-produced fabric requires 55 litres of the precious resource. Plus, khadi clusters also generate direly needed income for rural Indian communities.

Khadi is Organic and Environment Friendly!

Khadi is woven in pure cotton, silk, wool, or a mix of fibers. Manufacturing Khadi, is an eco-friendly process because it does not depend on electricity. Besides this, toxic waste products are also not generated in its manufacturing process.

What is khadi silk?

Khadi silk is 50% cotton and 50% silk. This fabric is characterised by its sheen and luxurious appearance. It is more expensive than cotton Khadi and must only be dry-cleaned as opposed to cotton Khadi which needs to be starched so that it maintains its firm and crisp texture.

Is khadi fabric good for skin?

Khadi fabric is skin-friendly. Therefore, it is suitable for sensitive skin. It keeps the body cool during summers as it allows air ventilation. It can absorb moisture and sweat, making it the perfect choice for summers. Khadi fabric keeps the body warm, making it winter-friendly.

Is khadi silk expensive?

Khadi is expensive because it demands time, labour and years of expertise of spinners, weavers and tailors. As more and more powered machines come into play, the process becomes faster and less cumbersome leading to mass production.

Khadi Fabric

- Khadi fabric is also known as khaddari.
- Khadi clothing is the handspun, natural & organic fabric is ideal for Indian weather conditions and keeps the wearer cool in summer.
- Khadi is a skin-friendly that breathes and uses no chemical in manufacturing.
- It is cool in summer and warm in winter.

What makes khadi special?

Indian Khadi clothes can be worn in any weather. It keeps one warm in the winters and cool during the summers. Khadi material is a body-friendly fabric that does not cause any allergies or irritations, unlike other synthetic fabrics. Khadi dyes and weaves are done by hand.

Much before the term sustainable fashion gained global popularity, Khadi epitomized it. Since the spinning and weaving of the khadi fabric is done by hand, its carbon footprint is zero. A natural fabric, Khadi is perfect for any time of the year. On a hot day, it will let us breathe; on a chilly evening, expect a khadi silk jacket or stole to keep you warm. Khadi fabric can last for years, if maintained properly.

Many fabrics are formed from Khadi.

Cotton khadi is used for making shirts, dresses and even sarees. Similarly, Khadi silk is favourite among the fashion-conscious—khadi silk stoles, sarees, jackets are some of the many ways in which you can flaunt the fabric. Well,

that's not all! Khadi wool is also used to make caps and shawls.

We also have polyester khadi—yes, it exists and has a following of its own. From shirts to kurta-pyjamas, polyester khadi is used in a range of garments. If denims are your thing, [khadi](#) has found its way into this largely-popular segment too. Khadi denim jeans blend fashion with sustainability.

Over a few decades, perception of khadi has changed –it became a politicians attire such as Nehru jackets and Gandhi topis. Despite these murky associations, Khadi continues to be a symbol to be respected and nurtured as it is durable and affordable and adds to elegance in simplicity.

From dresses and jackets to bridal lehengas and deconstructed local silhouettes, several leading designers (like Sabyasachi, Wendell Rodricks and Rajesh Pratap Singh) have taken on the fashion challenge to reinvent the humble fabric into high-fashion wear.

Khadi silk sarees are the pride of India. This humble fabric, however, is today a big rage in the Indian fashion circuits due to some of its exemplary qualities. Coarsely textured, Khadi silk is strong and durable and has a long shelf life. Khadi silk is made up of cotton and silk which when spun on a spinning wheel or chakra creates yarn that is next wound into reels. These reels of yarn are used to produce the Khadi silk fabric. There are pockets of air that are created during the process of weaving which helps the fabric to breathe, making it an ideal wear in summer.

Khadi silk sarees have a natural sheen to them, this clubbed with the silken shine of the silk threads in them, makes them shine even more. Khadi silk sarees are uniquely featured with the ability to stay cool and comfortable in summers and warm and cosy in winters. Their classy look makes them a wearable attire for daily casual wear, corporate wear and stylish wedding sarees.

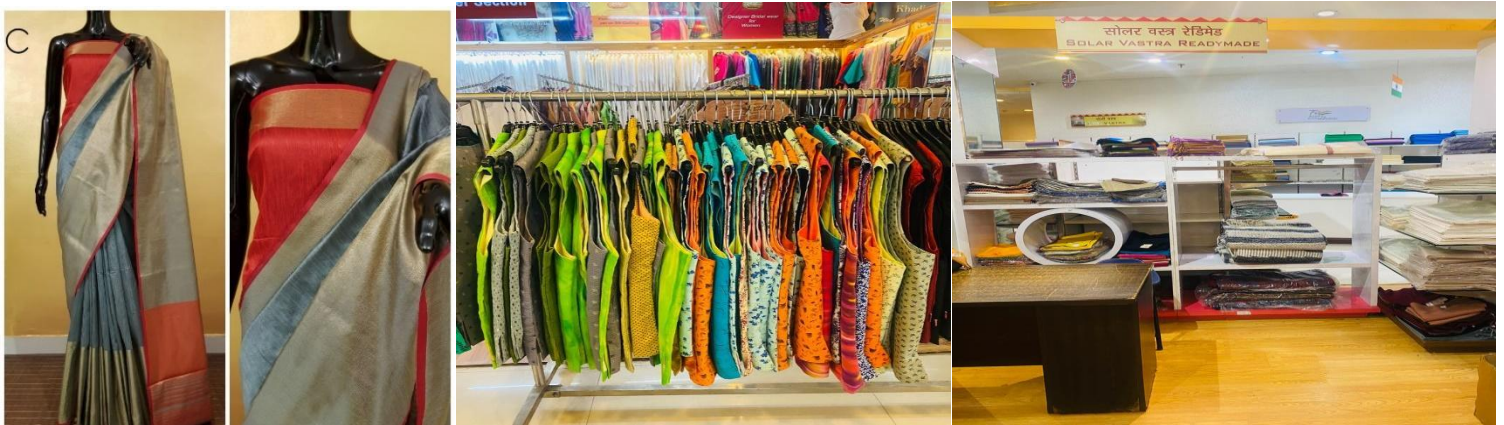


Fig 3.1 Khadi garments

Source: Khadi Gramodyog, Delhi

Learning Engagement:

1. Mention briefly the features of Khadi silk.
2. Why is khadi silk preferred over regular silks?
3. How does Khadi silk contribute to the country's economy?

UNIT- IV

Tools and Techniques used to make Khadi



Learning Objectives

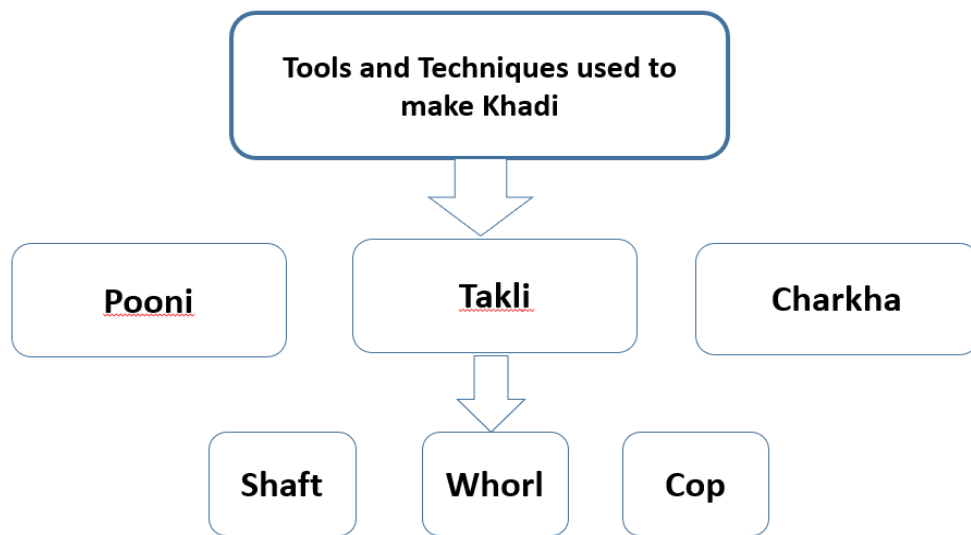
1. The learner will be able to operate the Amber Charkha and Solar Charkha
2. The learner will make the sut/thread with the help of Amber and Solar Charkha.

Learning Outcome:

- A. The learners will be able to recognise the raw material used and the end product i.e., Khadi and its various forms.
- B. The learners will be able to recognise the art of Spinning and weaving.
- C. They will be able to differentiate between traditional Charkha, Peti Charkha and Modern Charkhas like Solar Charkha

Development of Skills and Competencies -

1. Effective Communication and Citizenship.
2. Creative and thinking skills.



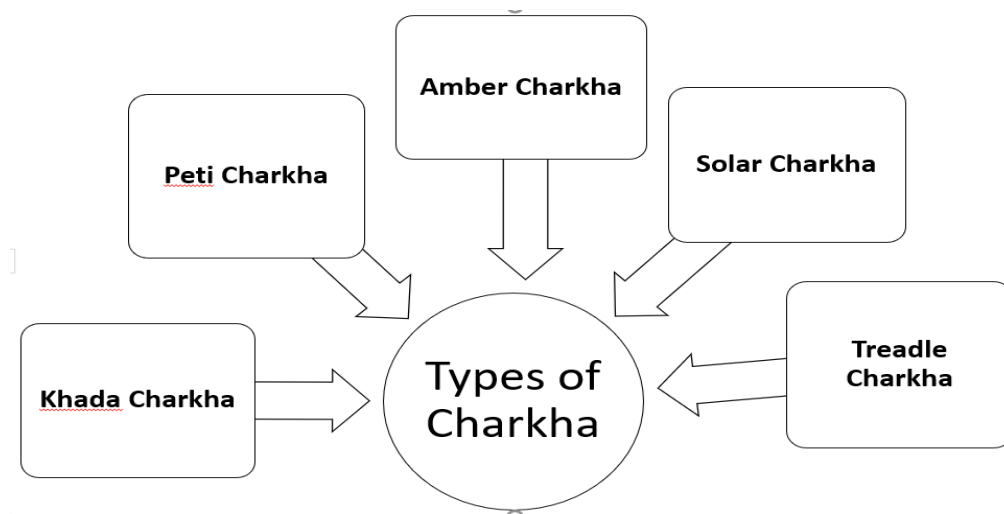
Khadi has been a part of the Indian household since ancient times. It has undergone various developments in terms of the raw material, tools and techniques used in making of Khadi cloth. Khadi has become a brand, which is liked by all and the products of Khadi have been used all over the world.

Pooni: As stated in module 1, Poonies are the elongated raw cotton made through Ginning and are used to make thread with help of Takli or Traditional Charkha.



Fig: 4.1 Cotton Poonies – Hand rolled
Source: Gandhi Museum, Delhi

CHARKHA AND ITS TYPES



Traditional Charkha:

The Cotton Khadi work was revived with the inspiration and encouragement from Mahatma Gandhi. Improvised traditional Charkhas also known as 'Rentia' or Ghantalia, and popularly named as Gandhi's Charkha were used to make khadi all over India. It was identified by the name of their place or province of origin, for example Punjabi, Rajasthani, Sawli, Madurai, Bardoli, TAMILIAN or Begaliu Charkha.

These charkhas were all standing types, having a wooden drive rotating on an iron axle and fixed between two vertical pegs. This wheel was directly connected to a cotton twine (Mala) to the spindle, which rotated, resting in the grooves of two smaller vertically fixed wooden pegs. Usually, a narrow strip of cotton cloth was wound around the spindle to serve as a crude pulley around which the twine passed.

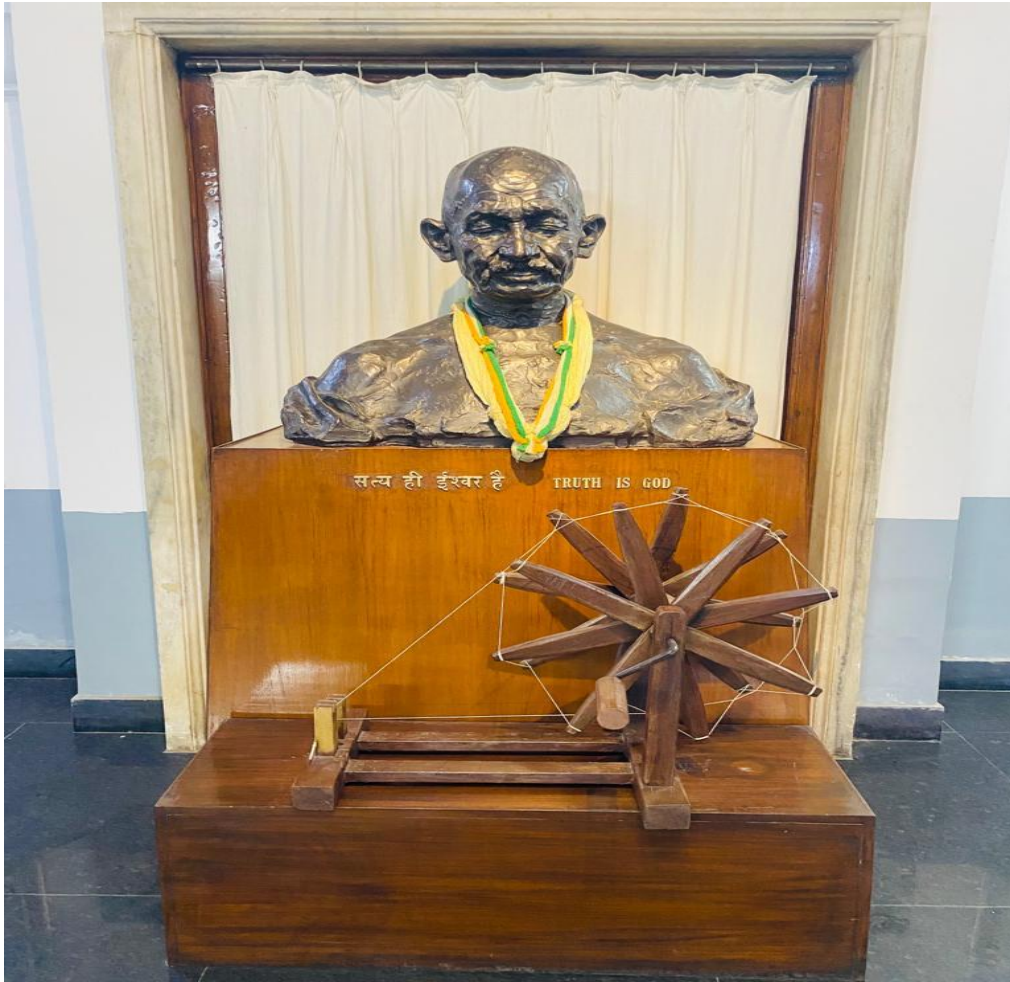


Fig: 4.2 Source: Khadi Gramodyog, Delhi

Peti Charkha or Yerwada Charkha:

You learned about Peti Charkha and its working in Module 1. It is a folding version of Charkha, which can be folded and contained in a small box. It became popular, as it is easy to carry during travel and convenient to store. Its design was improvised in Yerwada Jail, where Gandhiji was imprisoned and hence, it is known as Yerwada Charkha.



Fig: 4.3 Peti Charkha with its parts
Source: Gandhi Museum, Delhi

Modern Charkha and its type- There were serious limitations of low productivity and consequently low wages, the traditional charkha suffers from low quality also. The traditional yarn may have variations of Draft, count, and twists after every metre. With the changing times, there were many developments in the Charkha in search for higher productivity of spinning wheels.

Amber Charkha(Spindle Charkha): In late 1940s, one worker named Ekambaranathan from Tamil Nadu developed a miniature ring-spinning frame with four spindles. It was called ‘Amber Charkha’. Metal charkha was replaced by wooden charkha which was made out of rose wood with ball bearing, rollers for drafting, all the drives with cotton twines(malas) .Amber charkha witnessed continuous development from Handle charkha to Pedal charkha. Latest Amber charkhas are able to produce more than 30-40 hanks within eight hours.

Parts of Amber Charkha: The Amber set consists of one roving frame(Belni) and one spinning frame, each having four spindles. It is supported by the existing ‘Dhunia Modhia’ to make slivers. Roving can also be prepared on the spinning frame by making some changes in drafting and drives.

Dhunia Modhia: The Dhuoai Modhia or the Carding machine consists of a large wheel, which is linked by cotton band to a grooved pulley, which rotates a fluted feel roller. The fluted roller delivers the lint to the wooden cylinder fitted with tin-spikes. The fluted roller and the cylinder are closed except for an opening at the bottom to facilitate the falling of trash. There is a small wire connected to the cylinder in a small cage. The cylinder revolves at high speed, when the main wheel is operated. The fibres are thrown by centrifugal force into the cage.

The Belani or the drawing-cum-slivering machine: The loose opened out fibres collected in the wire cage to the Dhunia modhia are removed and tubular slivers are prepared on the Belni, which is a specially prepared wooden machine. In length, height and width, the Belni is identical with the Amber Charkha. It consists of steel drawing rollers weighted by springs. The lower rollers are fluted and the upper rollers are covered by rubber. The loose cotton fibres are drawn through these rollers a few times and then are formed into roving by a funnel and collected in a small tin cylinder having a ring fixed in its centre. The cylinder is revolved by a grooved pulley, which is banded with the main hand wheel. The revolution of the cylinder twists the roving. The drawing-cum- slivering machine or the Belni is tin cylinder and two pairs of iron rollers and rubber bushings.

https://youtu.be/H_go0RjaQr8

https://youtu.be/Xtv4_je78gk

https://youtu.be/fSs0_i3BFho

Solar Charkha: Gandhi ji’s Charkha 2.0

These solar charkhas are to be operated using solar power which is a renewable energy source. It will help in the development of the Green Economy, as it is environment friendly. It will also generate sustainable employment for the artisans. An average of 30 to 32 hanks of yarn can be made in a day with a hand-operated spinning wheel, where one hank means one thousand meters of thread, whereas solar Charkha produces 100 to 125 hanks in a day. These charkhas have the potential to be a force multiplier for the economy. They can boost productivity and augment artisans’ incomes.

सोलर चरखा मिशन

1 लाख से ज्यादा वैकेंसीस



Fig. 4.4 Solar Charkha

Source: story-S2RIYIRuVIhLnnGGip43fO (KVIC)

Benefits of Solar Charkha

- Easy spinning, person with disability or any age or women can do spinning with household work
- Uniform count, strong yarn as mills spun yarn
- Flawless and constant spinning that means more production and more income to artisans.
- No side effects on artisan or environment.

Yarn from a solar charkha is stronger compared to the manually operated charkha. In fact, yarns of desired strength could be achieved by proper choice of the drive. Yarns are more uniform compared to manually operated ones. This is because of the incorporation of a battery, which helps to give uniform power, even in the variable climatic conditions.

Yarns made by Solar Charkha are nearly free from knots. This is because of the absence of jolts and jerks in the Charkha which are there when a human being cranks it, throwing more or less a significant fraction of the body weight on it, thus, resulting in fewer breakage of yarn, less down-time and greater productivity.

<https://www.kviconline.gov.in/msc/videos/01.mp4>

https://youtu.be/_9cPFAGw8kg

<https://youtu.be/Q0Ji4MRtcCk>

Field Trip to KVIC or any working Unit spinning yarn through Amber and Solar Charkha: Prepare a file and write the working of Amber and Solar Charkha with pictures of self, working on Charkha.

LEARNING ENGAGEMENT

1. Using Peti Charkha, make hanks to be used for weaving.
2. Making Hanks through Amber Charkha.
3. Making Hanks through Solar Charkha

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Glossary:

KVIC:: Khadi and Village Industries Commission

Yarn: spun thread used for weaving

Takli: a tool to spin yarn from raw cotton.

Pooni: Rolled raw cotton used for making yarn.

Solar Energy: Energy derived from Sun

Carding : The process of preparing the fibres of cotton, wool, etc, for spinning.

Spinning: A twisting technique to form yarn from fibres.

Weaving: A method of textile production in which two distinct sets of yarns or threads are interlaced at right angles to form a fabric or cloth.

