



Master Lesson Plan

For

Crop Production and Management

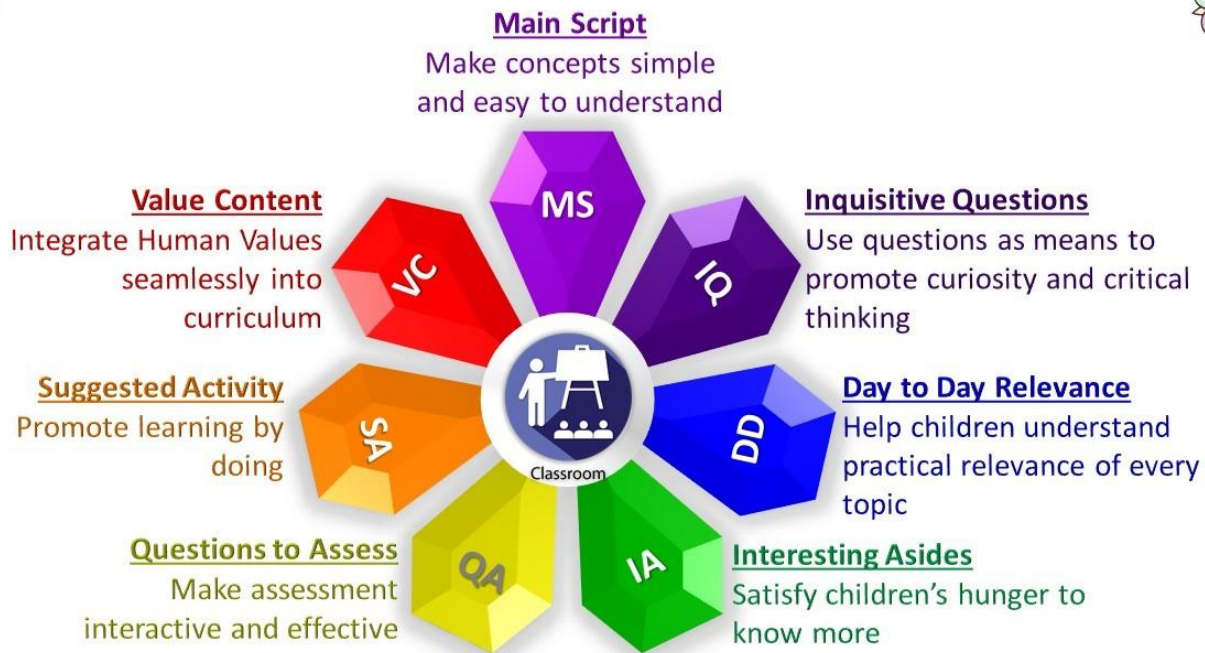
Board	Standard	Subject	Chapter	Language	Reference Link	Creation
CBSE	STD VIII	Science	Crop Production and Management	English	Crop Production and Management	2020-12

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Master Lesson Plan (MLP) - Covers the entire chapter with the help of these 7 asset types



For more information on how to use the lesson plan effectively, please scroll to the guidelines at the end of this document.

Crop Production and Management

1. MS_ Objectives_ Crop production and management

Notes to the teacher: This asset lays down the proposed plan for transacting this chapter. It states the asset objectives of the MLP. This asset is for teacher's reference and need not be taught to the students:

Students will be able to...

- inquire about the relation between plants and season
- discuss the basic practices of crop production
- differentiate between good and bad seeds
- examine the tools used in farming
- recognise the modern agricultural implements used in everyday life classify
- the cropping seasons of India
- appreciate agricultural practice in ancient India
- describe organic farming
- have an advantage of knowing the origin of manure and pesticides
- investigate the effect of manure and fertilizer on soil
- associate how earthworms help the farmers
- benefit from additional information on rabbit droppings
- explore the different ways and methods of storing food
- respect farmers and dignity of labour
- enumerate the elements of animal husbandry
- recommend the ways of taking care of cattle
- revise the different concepts of the chapter 'Crop production and management'

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Food & its production	Storage of grains, Sowing, soil nutrients, Preparation of soil, Manure, crops, Irrigation, Fertilizers, improvement, Crop production management practices of crop production implements, Adding manure

2. IQ_ Growing Crops!

[Notes to the teacher - Teacher may enable the students to think and come out with as many answers as possible before giving out the right answer/ answers]

1. Have you ever wondered why certain fruits and vegetables are available only during certain periods of the year?

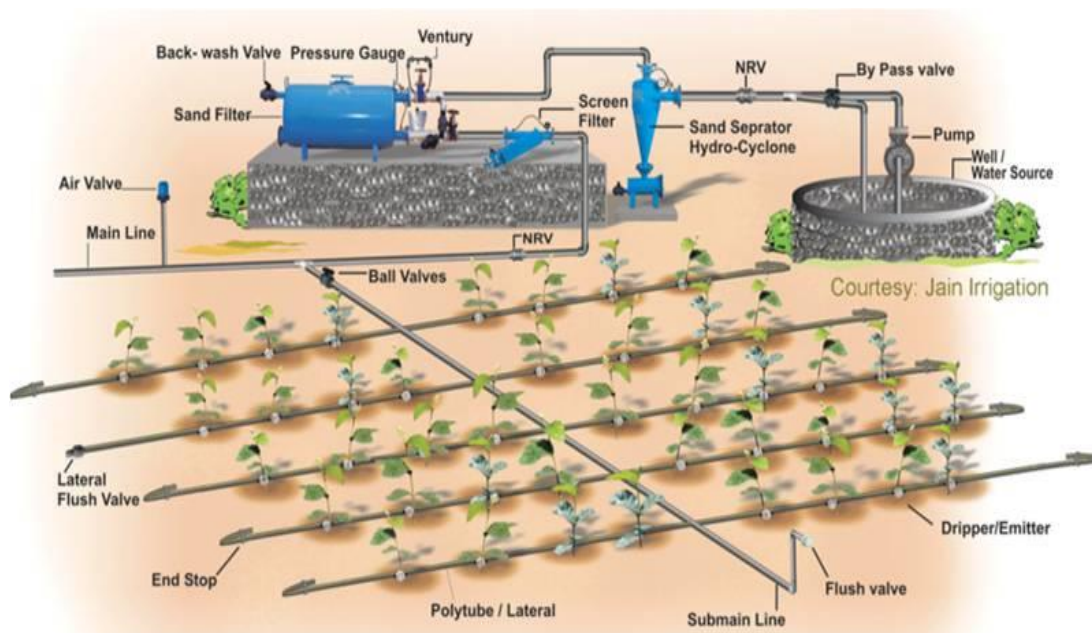
Suggested Answer: Different plants require varied climatic conditions to grow.

For e.g. mangoes grow best in loamy soil and in sunny climate. Carrots, radish and mustard need the cool winter climate and loamy soil to grow.



2. Heera's regions suffer from shortage of water. Which method of irrigation would you suggest and why?

Suggested Answer: Drip irrigation because it minimises the use of water and the water drips or falls exactly near the root zone through pipes.



3. Reena wants to know the drawbacks of an uneven distribution of seeds in a field while sowing. Can you help her?

Suggested Answer: If the seeds are distributed unevenly, then the seeds do not germinate properly because there will be competition among the seeds for nutrients, space and water.



4. Ram advised Pawan to plant crops in rotation. Can you identify the reason?

Suggested Answer: Crop rotation makes the soil fertile, the use of chemical fertilisers is reduced. The weeds, pests are also reduced.

**5. Tina, during a visit to her friend talked a lot about organic farming. What do you think is organic farming?**

Suggested Answer: Organic farming means growing crops without using chemicals, pesticides, fertilisers, growth hormones etc. Here the crops are grown using natural ways such as using biological materials so that the fertility of the soil is maintained and there is no wastage and pollution.

**6. Do you think it is possible to fully grow a crop in a nursery? Give reasons.**

Suggested Answer: No, it is not possible to fully grow a crop in a nursery because some crops require larger space and hence have to be cultivated in fields.



7. A farmer grows maize crop in a field year after year. He finds that the yield becomes low. Give one possible reason for it.

Suggested Answer: Due to loss of nutrients in the soil.



8. How can he rectify the loss?

Suggested Answer: By growing leguminous plants alternately in the same field.



9. A farmer did not use nitrogenous fertiliser before sowing cereal crop as the field had been enriched with this nutrient by the crop grown earlier. Name the crop the farmer might have grown earlier?

Suggested Answer: Any leguminous crop.



Image Source:

<https://pixabay.com/en/mango-tree-mango-mangifera-indica-321075/>

<https://pixabay.com/en/white-radish-radish-vegetables-food-5756/>

Carrots- <https://pixabay.com/en/carrots-root-vegetables-fresh-food-3728705/>

<https://commons.wikimedia.org/wiki/File:Dripirrigation.png?uselang=fr>

<https://pixabay.com/en/seeds-sow-garden-cross-gardening-1302793/>

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https://commons.wikimedia.org/wiki/File:Field_with_mixed_intercropping_of_oat_and_rye_3.jpg – Public Domain

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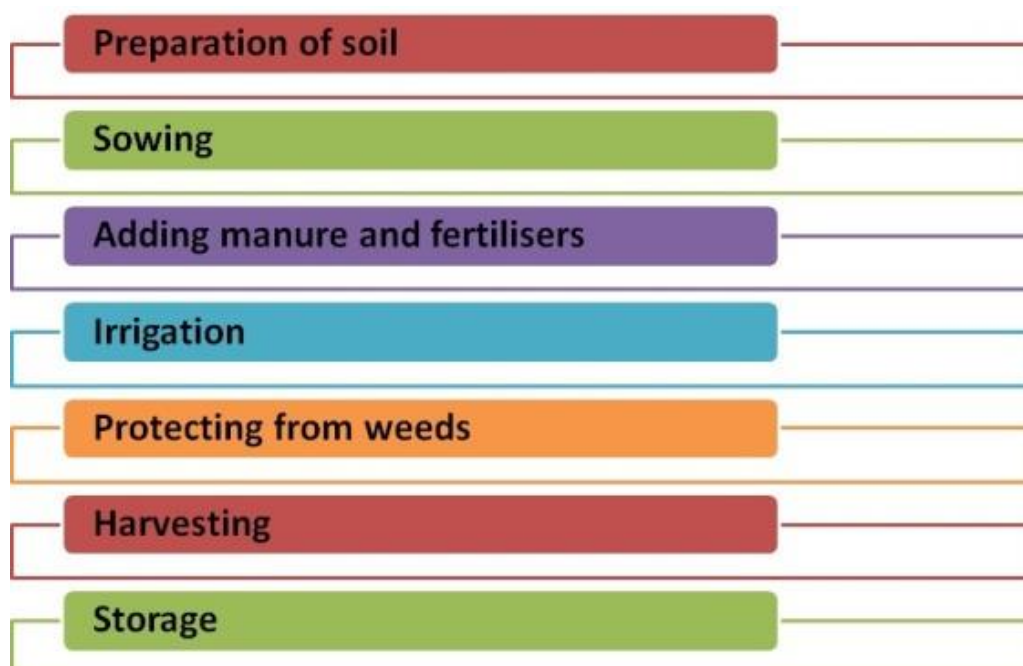
<https://pixabay.com/en/beans-leguminous-plants-pulse-297301/>

<https://pixabay.com/en/legumes-peas-pod-vegetable-healthy-3200097/>

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Inquisitive Questions	Food & its production	Cropping patterns

3. MS_Crop Production

Farmers have to go through several steps in order to produce the crops necessary. These are similar to the way plants are grown and nurtured by us in our garden. These steps involved in crop production are generally termed as agricultural practices.



Preparation of soil

- Preparing the soil is the first step to be followed before growing crops.
- The most important step in preparation of soil is tilling.
- Tilling means ploughing.
- Here the soil is turned and loosened.
- This helps in the growth of microbes in the soil that support the crops in growing.
- The loosened soil helps the roots to breathe easier and thus the roots can go much deeper.
- In this step few weeds are also destroyed.
- The residues that are left from the previous crops are mixed and decomposed.

The steps taken by farmer are



I. Ploughing: Ploughing is the opening of compact soil with the help of ploughs. By this process, turning of soil, uprooting of weeds are also done. By ploughing the farmer introduces air in the soil.

It is done in two ways.



A. Manual ploughing: By this method the farmers plough the field with the help of a wooden plough with an iron sharp point drawn by a pair of bulls.

B. Mechanised ploughing: By this method farmers plough the field with a tractor. It saves labour and time.

Leveling

Once the field is ploughed, the top soil is very loose. The loose soil can be washed off easily if there is a strong wind or rain. In order to avoid this, the soil is leveled with an implement called the leveller. A leveller is a heavy wooden or iron plank. By leveling water can be uniformly distributed during irrigation. This is the final step of soil preparation.

Sowing

Sowing refers to the process of planting or scattering seeds in the prepared soil. This method is also called broadcasting. Good seeds are first selected on the basis of their quality and health.

Before sowing the following conditions should be kept in mind:-

- The land must be watered.
- Only certified seeds should be sown.
- Seeds of other varieties should not be mixed.
- Seeds should be mature and well developed and they should have passed the requisite dormancy period.
- The germination ability should be high.
- Seeds should be free from pests and diseases.

Sowing could be done by two methods.

A. Broad casting. B. Seed Drill

A. Broad casting: It is an old method of sowing. Here, seeds are spread over the field in a uniform manner and the land is covered by ploughing. It has been observed that the spreading of seeds can never be uniform and there is a lot of wastage. Therefore, this method is used to sow the fodder crops or other cheaper crops only.

B. Sowing by a seed drill: Now-a-days seed drill is used for this purpose. It is the modern and the most efficient method of sowing seeds. The seeds are scattered evenly and at correct depths in the soil by attaching iron drills to a tractor. By this method the seeds can be sown in lines. It also facilitates in keeping a uniform depth and stops wastage.



Adding manures and fertilisers

Some fields may not have enough nutrients to support the growth of healthy crops. Also continuous growing of crops makes the soil poorer in certain nutrients. In order to replenish the deficient soil to a suitable one we add certain substances. The substances added to the soil in the form of nutrients are called manure and fertiliser.

Manure is an organic substance that is formed by the decomposition of plant or animal wastes. Farmers dump organic wastes in open pits where it is allowed to decompose. This decomposed substance is used as organic manure.



Fertilisers are chemical substances which are rich in a particular nutrient. They are man-made mineral salts. They are produced on a large scale in factories. Fertilisers can be either natural (organic) or synthetic. Natural fertilisers are those that are derived from plants or animals while synthetic fertilisers are those made in a laboratory. Natural fertilisers never harm the quality of soil and also the crops, overuse of synthetic fertilisers harm the soil in the long run.

E.g. urea, ammonium sulphate, potash

Irrigation

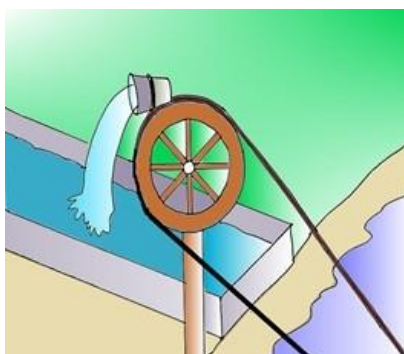
Water is essential for growth of plants. Essential nutrients travel to different parts of the plants using water as a medium. Seeds cannot germinate in the absence of water. Moreover, some crops require water in order to protect them from extreme conditions of summer and frost. Thus, water is supplied for a germinating and developing plant at different intervals.

The supply of water to crops at different intervals is called irrigation. The sources of irrigation are generally wells, tube wells, ponds, lakes, canals, dams etc.

The traditional irrigational methods followed in India are as follows:



(i) Moat - Pulley system



(ii) Chain pump



(iii) Rahat (Lever system)



(iv) Dhekli

*Moat (pulley -system): It involves pulling water up from a well or any other water source. It does not cost a lot of money to install but is time consuming.

*Chain pump: In this system, a container is fixed to a wheel, which helps to draw out water to the field

*Dhekli: Here, instead of using a pulley, water is drawn out using a piece of rock attached to a stick

*Rahat (Lever system): In this system, a cow or buffalo is used to move the wheels which in turn draw out water to the field.

Nowadays modern methods like furrow irrigation, sprinkler irrigation, basin irrigation and drip irrigation are used to water the field.

Canal Irrigation system



Water wheel

Water is usually taken from wells using pumps.
Modern systems are of two types:

Sprinkler System: This system is more useful where sufficient water is not available. It is also used when the land is uneven. There are pipes fitted perpendicular to the ground. At the top of the pipes there is a rotating nozzle. The lower end of these pipes is connected to the main pipeline at regular intervals.

Sprinkler irrigation system



Water is supplied to the main pipelines using pumps. Due to this pressure, water flows through the rotating nozzles and water is sprinkled to the surrounding area. It looks like it's raining.

(i) Drip system: In this system, the water falls directly at the roots drop by drop. Hence, it is called drip system. This is a suitable method of irrigation where water supply is poor. There is no wastage of water.



Protecting from weeds

Removal of weeds from the field is called 'weeding'. The weeds are undesirable plants which grow along with the crop plants and compete with them for water, nutrients, space and light and finally affect their growth

e.g Grass, Amaranthus, Chenopodium, Convolvulus, and Avena.

Methods of weeding are

i) Manual weeding ii) Chemical control.

i) Manual weeding: In this method weeds may be removed manually by uprooting them by hand or by using some tools like hand fork, khurpa and harrow.

ii) **Chemical control:** In this method weeds are removed by applying weedicides. Weedicides are the chemical substances which destroy the weeds but do not harm the crop. E.g. Dalapon, metachlor, 2-4-Dichlorophenoxy- acetic acid.



Weeding is done in several ways.

- It may be done initially when tilling is done and the uprooted weed is mixed with the soil and turns into humus.
- Another method is manually cutting or uprooting them at regular intervals.
- The third method is applying chemicals to the field which exclusively destroy weeds. These chemicals are called weedicides.

Weedicides do not destroy crops. Weedicides are applied before the weeds produce flowers or seeds. Care must be taken while applying weedicides as they can adversely affect the health of the farmers using it.

Harvesting



It is the next step after weeding. It usually takes about three to four months before a cereal crop matures. Then it is either pulled off or cut very close to the ground. The cutting of crops after they mature is called harvesting or "Removal of entire plant or economic parts such as grain, seed, leaf and root after they mature from the field is called as harvesting."

Harvesting is done either manually or by mechanical means.

In manual harvesting, sickle or long knives are used for harvesting plants. In mechanical harvesting mechanical harvesters are used.

Now-a-days combined harvesters are used which carry on various functions such as cutting the crop, separation of grains from straw(threshing), removal of chaff (winnowing) and transportation of grains to the storage tanks.

Harvesting was earlier done manually by sickle or by a machine called a harvester.

In the harvested crop, the grain seeds need to be separated from the chaff. This process is called threshing. Winnowing is also carried out for the separation of grain seeds.

COMBINE



- Combine is a machine which is used both as a harvester and thresher.

Storage



After threshing and winnowing the grains/seeds are stored in gunny bags and sent either to godowns or market for selling. They also have to be protected from insects, pests, mice. Usually farmers store grains in jute bags or metallic bins but if the grains have to be stored in a large scale, they store in granary or silos.

The mode of storage depends upon the quality of food material.

Food material is of two types i) Perishable foods ii) Non-perishable.

- Perishable foods get spoiled within a short span of time at room temperature. So they are stored in cold storage.
- Non-perishable foods do not get spoiled at room temperature and can be stored for a longer time.

So they are stored in dry storage.

Marketing:

Farmers mainly rely on their agricultural products for their livelihood. It should fetch a good price. So, warehousing and marketing facilities are essential to face the needs of the farmer.

Image source:

<https://pxhere.com/en/photo/1071452>

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https://commons.wikimedia.org/wiki/File:Sowing_machine_Nordsten.jpg Mahlum

<https://pixabay.com/photos/fresh-compost-hand-man-2386786/>

Original contribution – radhika.bala@gmail.com

[Background sky and field - https://pixnio.com/flora-plants/crops/clouds-blue-sky-agriculture-crops-wheat](https://pixnio.com/flora-plants/crops/clouds-blue-sky-agriculture-crops-wheat)

Original contribution – radhika.bala@gmail.com

Moat - <https://commons.wikimedia.org/wiki/File:Irrigation2.jpg>

Grass layered - <https://openclipart.org/detail/243741/grass-layered>

Grass - <https://openclipart.org/detail/84037/grass>

Other graphics – original contribution - radhika.bala@gmail.com

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<https://pixabay.com/en/garden-sprinkler-hose-water-grass-2591363/>

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<https://www.publicdomainpictures.net/en/view-image.php?image=304882&picture=two-farm-silos-in-autumn-landscape>

Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Main Script	Food & its production	Crop production management practices of crop production and fertilisers, Basic practices of crop production manure and fertilisers

4. SA_ Good and Bad Seeds

Aim: To differentiate between good and poor quality seeds.

Materials required: Beaker, water, some paddy or wheat seeds.

Setting for the Activity [Indoor] : Indoor (classroom activity)

Type of Activity: [Whole class]

Procedure:

1. Take a beaker half filled with water.



2. Put handful of wheat/paddy seeds.

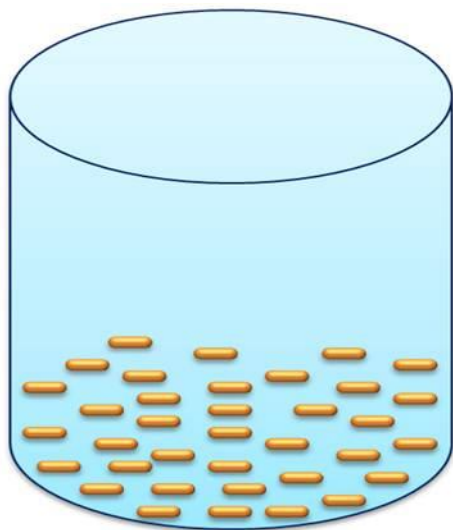


3. Wait for some time.



Observation: Damaged seeds float on the top of the water.

Conclusion: Good quality seeds sink and only those are used for cultivation. Rest is discarded.



Instructions to Teacher include:

- ✓ The activity is for the whole class.
- ✓ The teacher has to demonstrate the activity in the class.

Discussion Questions-

1. Why do damaged seeds float on the top of water?

Ans. Damaged seeds are hollow and do not have nutrients. Hence they float in water.

2. Healthy seeds sink- Give Reasons

Ans. Healthy seeds sink because they have nutrients which makes them heavy.

Image Source:

<https://pixabay.com/en/water-large-beaker-measured-307668/>

<https://pixabay.com/en/wheat-grain-agriculture-seed-crop-381848/>

<https://pxhere.com/en/photo/959472>

Original contribution – vandana.nagesh@gmail.com

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Suggested Activity	Food & its production	Sowing

5. MS_ Agricultural implements

The process of turning and loosening soil is called tilling or ploughing. Turning also brings out the organic rich soil that is present in the bottom layer towards the top and thus the crops can utilise it. Thus the nutrient held by the dead organic materials becomes accessible for crops. Tilling can be done using a plough which can be either wooden or metallic.



Ploughed land

When ploughing is completed, the field may have large blocks of soil called crumbs. This may leave the field uneven and not suitable for cultivating crops. So the bigger blocks of soil have to be broken down to smaller pieces to an even level. This process is called levelling. It is done using a leveller.

Agricultural implements used for the preparation of soil

Before sowing, it is necessary that the soil has to be broken down to the size of grain and suitably aerated. For that we use several agricultural implements. Few of them are described below:

Plough:



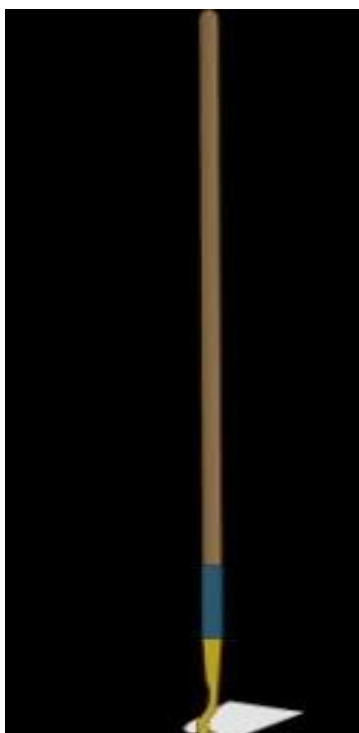
It is one of the earliest agricultural implements used. It is used for tilling of the field, removing weeds etc. It has mainly three parts: plough shaft, plough share and the beam.

- Plough shaft is the long handle;
- Ploughshare is the triangular iron strip
- Beam is placed on the bulls' neck.

The older wooden plough is replaced by iron ones now-a-days.



Hoe:



A hoe is a simple tool used for loosening the soil and removing weeds. The larger version is pulled by animals. Similarly we also use pick axe, trowel, cultivator, etc.

Image source:

Ploughed land: SSSVV Gallery

Plough: SSSVV Gallery

Tractor - <https://pixabay.com/en/plow-tractors-m%C3%BCnsterland-1534517/>

Hoe: <https://pixabay.com/en/hoe-tool-manual-garden-dig-farmer-30427/>

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Food & its production	Crop production management

6. DD_ Modern Agricultural tools

1. Walking Tractor:



- It is an agricultural machine which has a single axle (rod) and is operated by handles. It has medium motor power and strength.
- It is mostly used for horticultural and ornamental work.

2. Drag



Drag is an agricultural equipment which has a frame made of wood and metal teeth and the hook- like structure that attaches to a tractor.

3. Sprayer:



Sprayer is a farm equipment used to spray water, insecticide, pesticide, etc.

It is composed of a liquid tank, pressure pump, cap, mouth, tank and pressure valve, belts, hose, faucet and nozzle.

Image source:

<https://www.maxpixel.net/Field-Farmer-Rural-Equipment-Tractor-Farming-Farm-2404716>

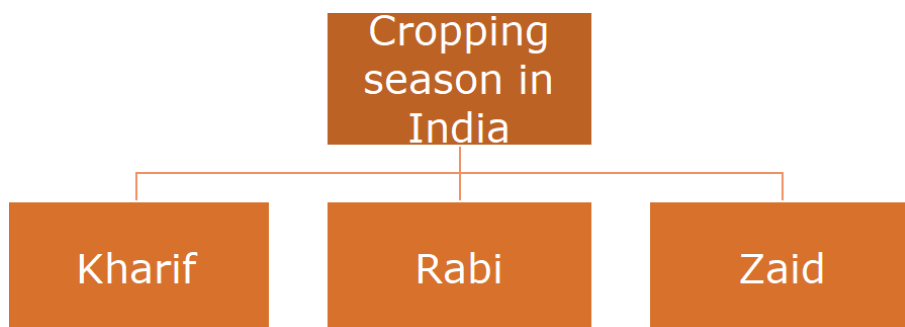
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Time to teach	Asset Type	Theme	Sub Theme
3 Minutes	Day-to-day Relevance	Food & its production	Agricultural implements

7. MS_ Cropping Seasons!

There are three chief seasons in India namely Kharif, Rabi and Zaid.



i) **Kharif Crops:** The crops which are sown in the rainy season (June to September) are called kharif crops.

These crops are harvested from September to October. They are mostly the monsoon crops. Such crops require lots of water. Example: Rice, sorghum, maize, ragi, soyabean etc.



Paddy Fields

ii) **Rabi Crops:** These crops are grown in the winter season (October to November) are called rabi crops. Their time period is generally from October to March. These crops are harvested from February to April. These crops require cold weather for their growth and also require less water.

Example: Wheat, oats, barley, mustard, peas



Wheat field

iii) **Zaid Crops**

These crops are sowed between March and June i.e. between kharif and rabi. They require warm and dry weather for their growth and more day light for flowering.

Example: Seasonal fruits and vegetables.



Image source:

<https://pixabay.com/en/rice-ear-of-rice-paddy-field-3699252/>

<https://www.publicdomainpictures.net/en/view-image.php?image=28540&picture=golden-wheat-field>

SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Food & its production	Kharif and Rabi crops

8. IA_ Agriculture in Ancient India

The history of agriculture and civilisation go hand in hand as food production made it possible for primitive man to settle down in selected areas leading to formation of society and initiation of civilisation.

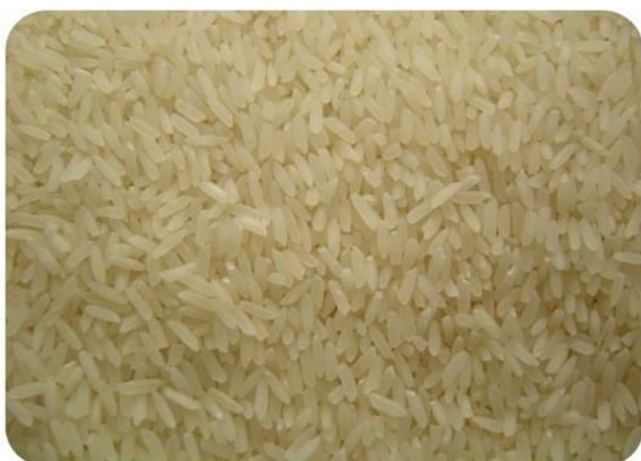
- The Greek diplomat Megasthenes (300 BC) in his book "Indika" provides an eyewitness account of Indian agriculture at that time.
- In that book he mentioned about India as follows:
- "India has many huge mountains with fruit-trees of every kind, and many great fertile plains. Most of the soil is under irrigation, and has two cropping seasons in a year. In addition to cereals, there grows millet, and different sorts of pulses and rice throughout India".

Recordings of our agricultural practices in ancient India:

Types of lands: In Rigveda there is a mention on productive and non-productive soils.

The Amarkosha (c. 400 BC) described 12 types of lands, based on the fertility of the soil, irrigation, and physical characteristics.

Types of crops: It is believed that rice was cultivated along the banks of the Indian river Ganges in the sixth millennium BC.



Other crops cultivated in India 3000 to 6000 years ago, include sesame, linseed, safflower, mustard, castor, mung bean, black gram, horse gram, pigeon pea, field pea, grass pea (khesari), fenugreek, cotton, jujube, grapes, dates, jackfruit, mango, mulberry, and black plum.



Sesame Seeds



Linseed



Safflower



Mustard Seeds



Castor Seeds



Mung Beans



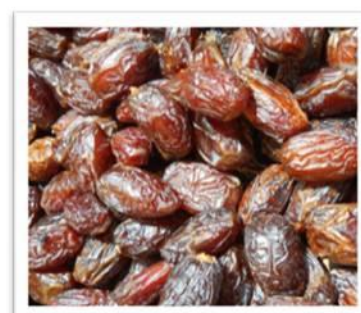
Cotton



Jujubes



Grapes



Dates



Jack Fruit



Mango

Planting time: Krishi-Parashara (c.400 BC) and Brhat Samhita predict rains for a particular season.

Land preparation: In Rig-Veda, farmers adopted repeated ploughings of land before sowing seeds.

Water management: Rigveda, Kashyapa Samhita, Kautilya's Arthashastra mentions irrigation of crops by river water through channels as well as irrigation from wells, rivers, tanks, canals etc

Manuring: In Krishi-Parashara, it is mentioned that crops grown without manure will not grow well, and Rishi Parashara has also described a method of preparing manure from cowdung.

Kautilya also tells the use of cow dung, animal bones, fishes, and milk as manure, long back.

Varahamihira’s Brhat Samhita, also recommends growing sesame to flowering stage and then using it as green manure.

Image Source:

Rice: <https://pxhere.com/en/photo/1259248>

Sesame Seeds: <https://www.publicdomainpictures.net/en/view-image.php?image=69665&picture=sesame-heap>

Linseed: <https://www.publicdomainpictures.net/en/view-image.php?image=260555&picture=linseed>

Sunflower seeds: <https://pxhere.com/en/photo/818540>

Mustard seeds: <https://pixnio.com/flora-plants/seeds/colza-seeds>

Castor Seeds: <https://pixabay.com/photos/castor-seed-seeds-tree-nature-2536904/>

Mung Beans: <https://pixabay.com/photos/mung-beans-vigna-radiata-moong-bean-166996/>

Cotton: <https://pixabay.com/photos/cotton-tajikistan-buttermilk-3760799/>

Jujubes: <https://www.maxpixel.net/Jujube-Red-Dates-Xinjiang-Jujube-Food-940598>

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Dates: <https://pixabay.com/illustrations/dates-fruit-sweet-dry-food-3579610/>

Jack Fruit: <https://pixabay.com/photos/jackfruit-fruit-fresh-tropical-3412939/>

Mango: <https://www.publicdomainpictures.net/en/view-image.php?image=27755&picture=mango>

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Interesting Asides	Food & its production	Basic practices of crop production

9. MS_ Organic Farming

- Organic farming focuses on cultivating the land and growing crops in an eco-friendly way. It helps keep the soil alive and in good health by use of organic methods and practices. This method uses organic fertilisers, pesticides and manure (crop, animal and farm wastes, aquatic wastes) and beneficial microbes (bio fertilisers) to release nutrients to crops for increased production. Organic farming ensures an eco- friendly pollution free environment.



Vermicompost: Vermicompost is a process in which certain worms such as earthworm are used to decompose the decaying matter into a nutrient rich fertiliser.

Green leaf manures: This is a process in which green leaves and twigs of some herbs, shrubs or trees are used as fertilisers in cultivation of crops.

Crop rotation: Crop rotation is a method in which different plants are grown one after the other in the same field to increase soil fertility.

Biological management: It is a type of pest control where the pests are controlled using other living organisms.

Animal husbandry: Animal husbandry is a type of animal science which involves the rearing and breeding of livestock.

Biofertilisers: Biofertilisers are substances which have microorganisms, which when applied to seeds or plants, enhance the nutrient content in the applied plant.

Manures: Manures are animal faeces or dungs that are used as organic fertilisers in agriculture.

Advantages of Organic farming-

- The aim of organic farming is to produce high quality, nutritious food that is good for our health care and well-being.
- Organic farming proves to be more profitable than the age-old traditional farming methods.
- It has been found that organic farming reduces the production cost by about 25 - 30%, as it does not involve the use of synthetic fertilisers and pesticides, which thus makes organic farming very cost-effective.
- This type of farming leads to a less toxic environment as far as the air, water and soil is concerned.
- Soil is the most important component in farming, and organic farming preserves the soil by reducing soil erosion up to a large extent.
- Organic farming also enables the farmers to use the soil for a longer period of time to grow crops, as soil fertility is maintained for a long time in such a case.

Image source:

<https://pixabay.com/photos/fresh-compost-hand-man-2386786/>

Green Leaf Manure: <https://pxhere.com/en/photo/625903>- CC0

Crop Rotation: <https://www.flickr.com/photos/41284017@N08/10503156453>

Animal Husbandry: <https://pixabay.com/photos/cows-field-herd-grazing-cow-farm-73371/> - CC0

Manures: <http://www.freestockphotos.biz/stockphoto/9162> - CC0

Biological management: <https://pxhere.com/en/photo/1214499> – CC0

Bio fertilisers: Original contribution – rushmish@gmail.com

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Food & its production	Improvement in crop yields

10. IA_ Origin of Manure and Pesticides

Early history

Even in ancient civilisations such as that of Sumer, Mesopotamia and Vedic India, man added plant nutrients to soil, and used natural repellents to control pests.



But how did it all start?

Many thousands of years ago, humans lived a nomadic existence moving from place to place with their livestock, which could include cattle, sheep, goats and pigs. They would grow crops for their own need, exploiting the land until it was no longer of much use. Using slash and burn technique they would move on to a new patch of land, without any sense of permanent ownership.



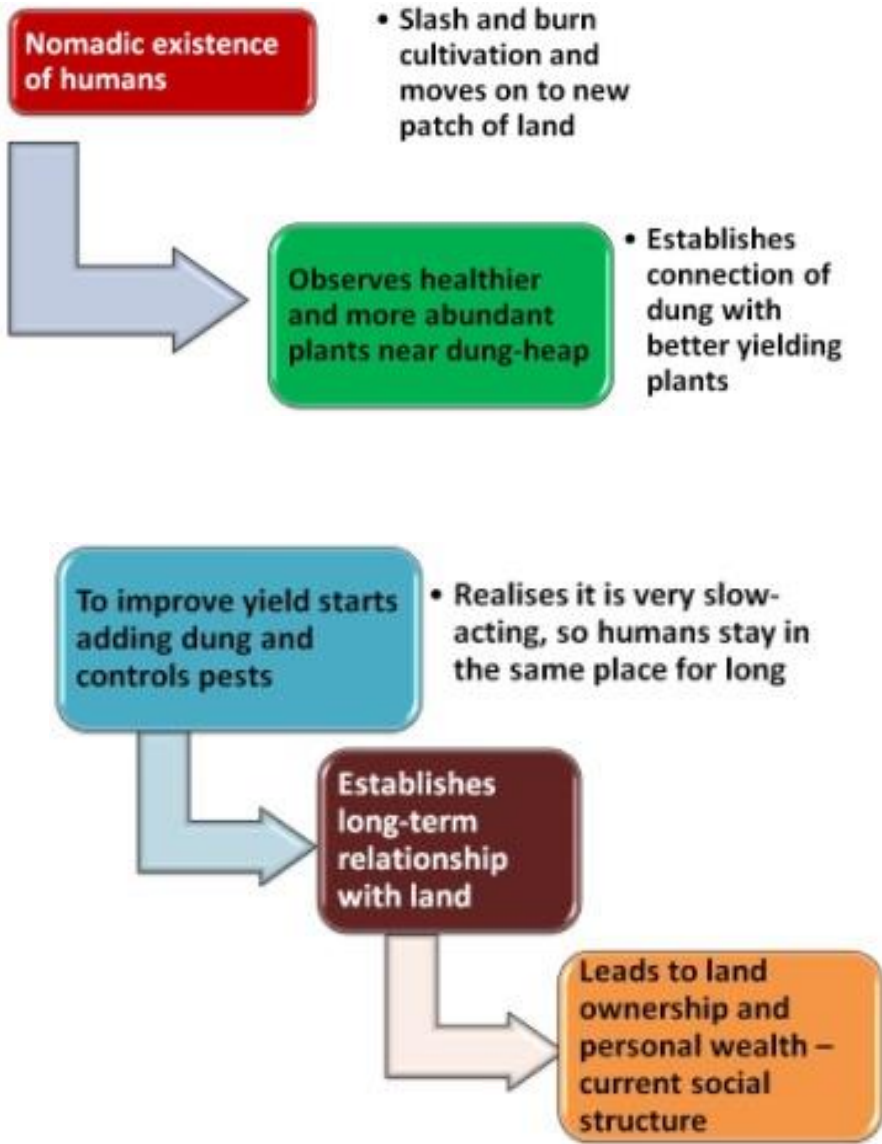
How did it all start?

Europe’s first farmers – Neolithic farmers used the dung from their herds of cattle, sheep, goats and pigs as a slow release fertiliser for crops 8000 years ago.

In the Vedic texts there are repeated references to agricultural technology and practices, including iron implements. Cow dung provided for fertiliser. Cow and bull are worshipped in India.

Pyrethrum, which is derived from the dried flowers of *Chrysanthemum cineraria folium* ‘Phrethrum daisies’, has been used as an insecticide for over 2000 years.

Beginning of use of manure



Victorian era manure crisis - 1894

Towards the end of the 19th Century there were tens of thousands of horses on the streets of London and New York transporting people and goods. Enormous amounts of manure piled up on the streets attracting insects, including typhoid-carrying flies. It was predicted that in 50 years, every London street would be buried in 9 feet of manure!!! The timely invention of affordable motor cars replaced horses, and a dreadful situation was avoided.

Image Source:

Cowdung cakes: SSSVV Gallery

Slash and burn: <https://www.flickr.com/photos/39416639%40N02/34878830792>

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Interesting Asides	Food & its production	Adding manure and fertilisers

11. SA_ Effect of manure and fertiliser on soil

Aim: To demonstrate the effect of manure and fertiliser on soil.

Materials required: 3 beakers, water, manure, fertilisers and some fenugreek/methi seeds.



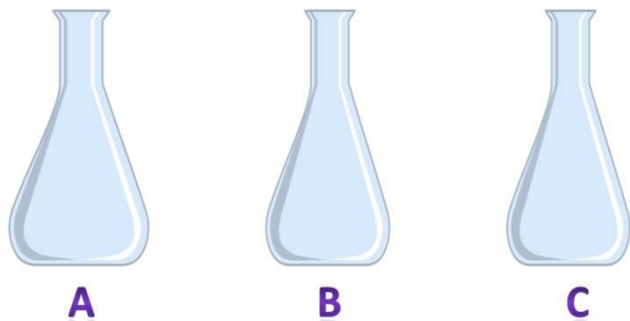
Setting for the Activity [Indoor]

Indoor (Classroom activity)

Type of activity: Whole class

Procedure:

1. Take 3 glasses- A, B, C.



2. To beaker A add a little amount of soil mixed with cow dung manure.



3. To beaker B add the same amount of soil with little urea.



4. To beaker C add only the same amount of soil without any manure or fertiliser.



5. Pour the same amount of water and plant seedling in each.

6. Observe the growth and report the result within one week.

Observation: The plants which grew in the fertilised or manure soil grow better when compared to the ordinary soil.

Conclusion: Students are able to see the difference after adding manure and fertiliser.



Precaution: Urea is highly toxic and children should use it under adult supervision only.

Discussion Questions-

1. What is Manure?

Answer: Manure is an organic substance made from decomposed crop residue or animal droppings. They are added to the soil to increase its fertility.

2. What is a fertiliser?

Answer: Fertilisers are used to increase the fertility of soil. They are synthetic and manufactured in factories.

3. What is Urea?

Answer: Urea is a chemical fertiliser. Its formula is CH_4N_2 . It is a Nitrogenous organic chemical compound.

Note to the teacher:

This is a project activity, so the time limit can be ignored.

Waiting time 1 week

Instructions to teacher include:

- ✓ The activity is demonstration.
- ✓ The teacher has to be careful while handling urea.

Image Source:

<https://pixabay.com/en/flask-beaker-chemistry-container-309923/>

SSSVV Gallery

SSSVV Gallery

https://hi.m.wikipedia.org/wiki/%E0%A4%9A%E0%A4%BF%E0%A4%A%E0%A5%8D%E0%A4%B0:Meti_by_ashish2_closeup.JPG

<https://pixnio.com/textures-and-patterns/artificial-fertilizer-agriculture-agriculture-granules-separation>

SSSVV Gallery

<https://pixabay.com/en/plant-young-plants-small-plant-786689/>

Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Suggested Activity	Food & its production	Manure, Fertilizers

12. DD_ Earthworm - A farmer's best friend

Earthworms are very important for good soil. They burrow in the soil. Burrowing helps in soil aeration. They convert the organic matter and enrich the soil. The enriched soil is rich in nutrients which is good for the growth of the plants.



<p>Improves soil nutrient availability</p>	<ul style="list-style-type: none"> Earthworms create humus that contains important nutrients useful for plant growth. Worms eat plant wastes such as manure, grass, leaves, and dead roots as well as the soil. The food they eat is rich in mineral and organic compounds so their cast becomes richer in nutrients than the soils around them. When the worms die, the body of the worm decomposes quickly which further contributes to the nitrogen content of the soil.
<p>Better drainage</p>	<ul style="list-style-type: none"> Earthworms improve drainage and prevent soil erosion and water logging, because burrowing helps to loosen and aerate the soil. Research has found that soil with earthworms drains as much as 10 times faster than soil without earthworms.
<p>Improved soil structure</p>	<ul style="list-style-type: none"> The casts of earthworms bind the soil particles together. They have a sticky substance that brings the mineral particles together. The mineral particles help to protect the organic matter from microbial attacks, thus preserving it for a longer time in the soil. Worm castings, improve the structure and fertility of every type of soil. The castings are water soluble so they have a quick positive impact on plant growth.

Image Source: SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Day-to-day Relevance	Food & its production	Nutrient management

13. IA_ Rabbit dropping

Rabbit Dropping Content

Nitrogen is a very good fertiliser. There are many types of animal wastes in nature. Among all the animal wastes, rabbit droppings contain the highest nitrogen content. It also has phosphorus in it which is good for the growth of flowers and flowering trees.



Before we add manure to our garden all the manure should be composted. Composting is treating solid wastes in which organic materials are broken down by microorganisms. If the manure has high salt content, then the plant could die. So in order to save the plant from starving, the manure has to be composted. But rabbit droppings need not be composted, they can be directly used in the garden.

Image source:

https://commons.wikimedia.org/wiki/File:Droppings_feral_rabbit.jpg

<https://pixabay.com/en/hare-rabbit-animal-cute-sweet-fur-2647220/>

Time to teach	Asset Type	Theme	Sub Theme
3 Minutes	Interesting Asides	Food & its production	Manure

14. IQ_ Storing food safely

[Notes to the teacher - Teacher may enable the students to think and come out with as many answers as possible before giving out the right answer/ answers]

1. Rizwan had a huge agricultural land on which he grew paddy. Every year he had the best harvest in his village with around 1000 tonnes of paddy. He stored his produce in a large barn which was constructed by his great grandfather. He always waited and kept his produce in store till he got the best price. However, he was disappointed every year and was worried to see that after few months of storage his produce would reduce by 100 tonnes.

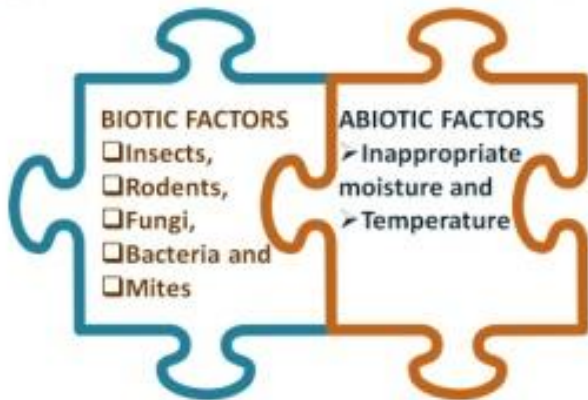
- (i) Why did the produce in the store get reduced?
- (ii) What remedial measure has to be taken to prevent it?
- (iii) What is the purpose of storing his produce?

Answer :

(i) The produce in his store got reduced because of improper storage conditions in his barn. The weight loss in his produce could be attributed to various factors.

The factors that cause storage losses are classified as biotic and abiotic factors.

FACTORS RESPONSIBLE FOR STORAGE LOSSES



(ii) Storage losses can be greatly reduced by adopting good and safe storage techniques.

1. Before storing, the food grains should be cleaned well and also sun dried to reduce the moisture levels.



2. The grains should be stored in clean bags and closed perfectly without holes.



3. The storage area should be clean, well ventilated and closed.



4. The holes for ventilation should be covered with metal strips to prevent insects and rodents from entering inside.

5. Traps can be used to prevent attack by insects and rodents.

6. The bags can be stacked on a raised platform to prevent contact with moisture in the floor.

(iii) Storing his produce will help him in case of any natural calamities like flood or drought. Storing the grains will also be useful when the yield is very poor the following year. He would also be able to sell the grains for more profit.

2. When you are out of home for a long tour, there might have been a power cut for a long time during which the frozen foods kept in the refrigerator would have thawed. But later it would have frozen again when the power was restored.



(i) Is it safe to consume that frozen food when you come back home?

(ii) Can you think of some way to find out how long the power cut would have lasted when you were away from home?

Answer:

(i) The frozen foods can be consumed safely if the power cut had been for a short time. If the power cut had been for a long time, it may not be safe to consume. Easily perishable foods like meat, milk etc., need to be discarded if they were thawed and kept above 40 °F for more than 2 hours.

It might be dangerous to consume such foods as they might spread salmonella and other bacteria resulting in food poisoning.

(ii) There is a very simple way to find out how long the power cut lasted. The only things needed are a cup, coin and water.

Fill a cup with water and freeze it and when it is frozen, keep a coin on top of it and leave it in the freezer.



1. There was no power cut, if the coin is still found on the top of the cup.

2. The power cut would have been for a short while, if the coin was found near the top or the middle of the cup. In this case, water would have melted partially and the coin also sinks partially. Thus the coin stays in the middle of the cup when it is refrozen.

3. The power cut would have been for a long time, if the coin was found at the bottom of the cup. The water melts completely due to which the coin sinks to the bottom of the cup.

Image source:

<https://pixabay.com/en/jigsaw-puzzle-jigsaw-puzzle-piece-303503/>

Original contribution

<https://pixabay.com/en/paddy-dry-nature-rice-agriculture-658711/>

<https://pixabay.com/en/gunny-bag-bag-export-gunny-sack-804624/>

<https://pixabay.com/photos/ikea-warehouse-industrial-tempe-2714998/>

<https://pixabay.com/photos/refrigerator-icebox-food-cold-1809344/>

<https://pixabay.com/en/euro-money-coin-water-sketch-496233/>

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Inquisitive Questions	Food & its production	Storage of grains

15. VC_ Be Grateful to Farmers

Learning Domain- Classroom

Cultivation of crops involves several activities undertaken by farmers over a period of time.



It is very clear that, in the entire process of crop production from seeding to producing organic manures to nurturing the crops till harvesting, the farmer plays a vital role.



Once in our life, we need a doctor, a lawyer, a policeman. But everyday, three times a day, we need a farmer. It's Love and Hard work of the farmer, which in the end contribute to real wealth and above all, Happiness to all.



To forget how to dig the earth and to tend the soil is to forget our Source. The following story emphasises this fact.

A boy once crossed the desert and finally arrived at an ashram in a village. He was told that the guru was delivering a discourse in the evening and the boy was given permission to attend it.



That evening, the Guru spoke only about the importance of farming and the farmers' work in the fields.



At the end of the talk, the boy said to one of the other inmates: 'I was really shocked. I expected to hear an enlightened speech on sin and virtue, but the Guru talked only about tomatoes and irrigation and things like that. Where I come from we all believe that God has created this Universe and that all we have to do is pray to Him.'



The inmate smiled and said: 'Here we believe that God has done His part and now it is up to us to continue the process.'



Children, nature has provided the necessary inputs for growing the crops. One of the reasons why we can appreciate farmers is that they are a great example of this. They still have to get up early everyday, rain, hail or shine, and do all the necessary work to look after their crops-they are a great example of working hand in hand with God to do our part of the bargain.



If you find food on your table 3 times a day, you should be grateful to the farmers. Do not underestimate the work that the farmers are doing.



Let us realise that every labour is dignified.



Image Source:

<https://pixabay.com/photos/wheat-fields-punjab-patiala-men-762213/>

<https://pixabay.com/photos/plough-animal-india-farm-field-1761505/>

<https://pixabay.com/photos/india-andhra-pradesh-east-godavari-4981354/>

<https://pixabay.com/en/animal-camel-desert-dunes-1299355/>

<https://www.youtube.com/watch?v=sSLYtKyKFRk> (Creative Commons Attributions – Reuse allowed)

<https://www.youtube.com/watch?v=di2JLGRum1I> (Attribution - [Sandy Entertainments](#))

<https://pixabay.com/photos/sugarcane-harvest-bullock-cart-223437/>

<https://commons.wikimedia.org/wiki/File:Thali.svg>

<https://freesvg.org/indian-woman>

Time to teach	Value Type	Value Sub Type	Value Attribute
10 Minutes	Right Conduct	Gratitude	Stories

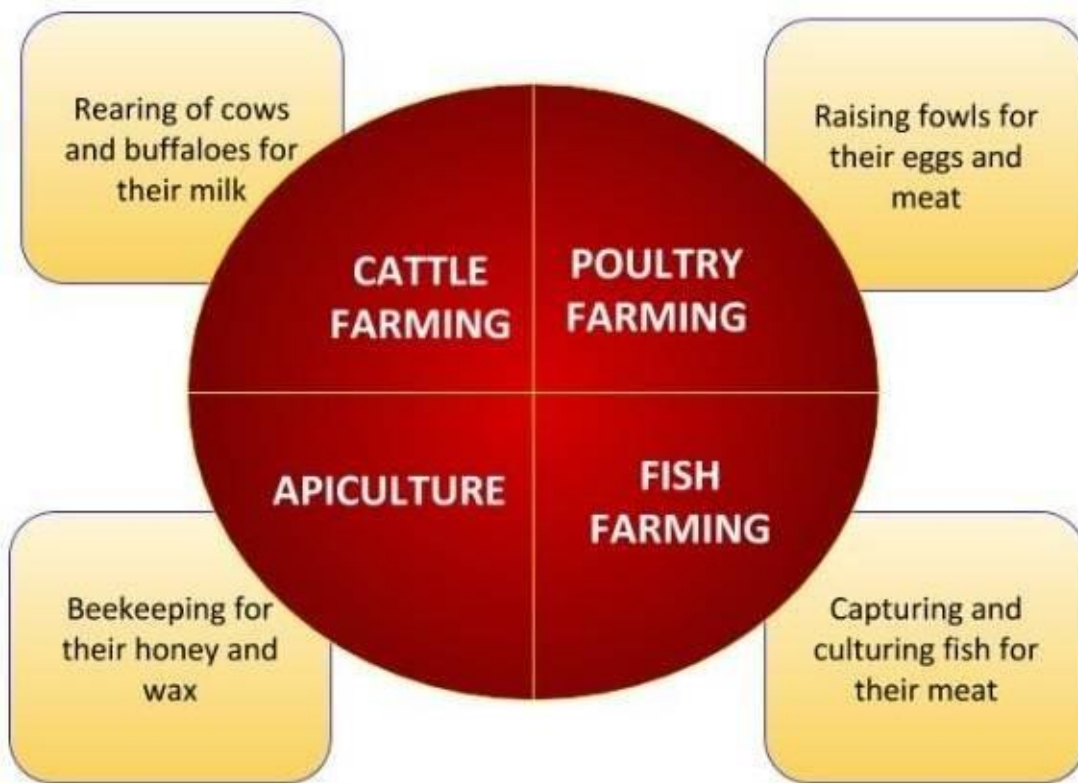
16. MS_ Animal husbandry and its elements

The branch of agriculture which deals with the feeding, shelter, health and breeding of domestic animals or farm animals such as cattle, pigs, horses and fowls is called animal husbandry. It also includes poultry farming and fisheries.

- Domestication is caring and controlling of a particular species of animals for various reasons of human interests like companionship, food, work, wool etc. The most defining characteristic of domestication is selective breeding.
- Human beings depend on animals for various needs and this includes food products like eggs, milk, meat and honey and other products like woollen garments and leather products.
- Earlier humans used to hunt wild animals for fulfilling their needs.
- But with the progress in civilisation, advancement of science and invention in new technologies, humans are trying to develop ways to increase the quality and quantity of food production from animals. Animal husbandry is the scientific management of animal livestock including their feeding, breeding and disease control.



Types of animal husbandry:



Elements of animal husbandry

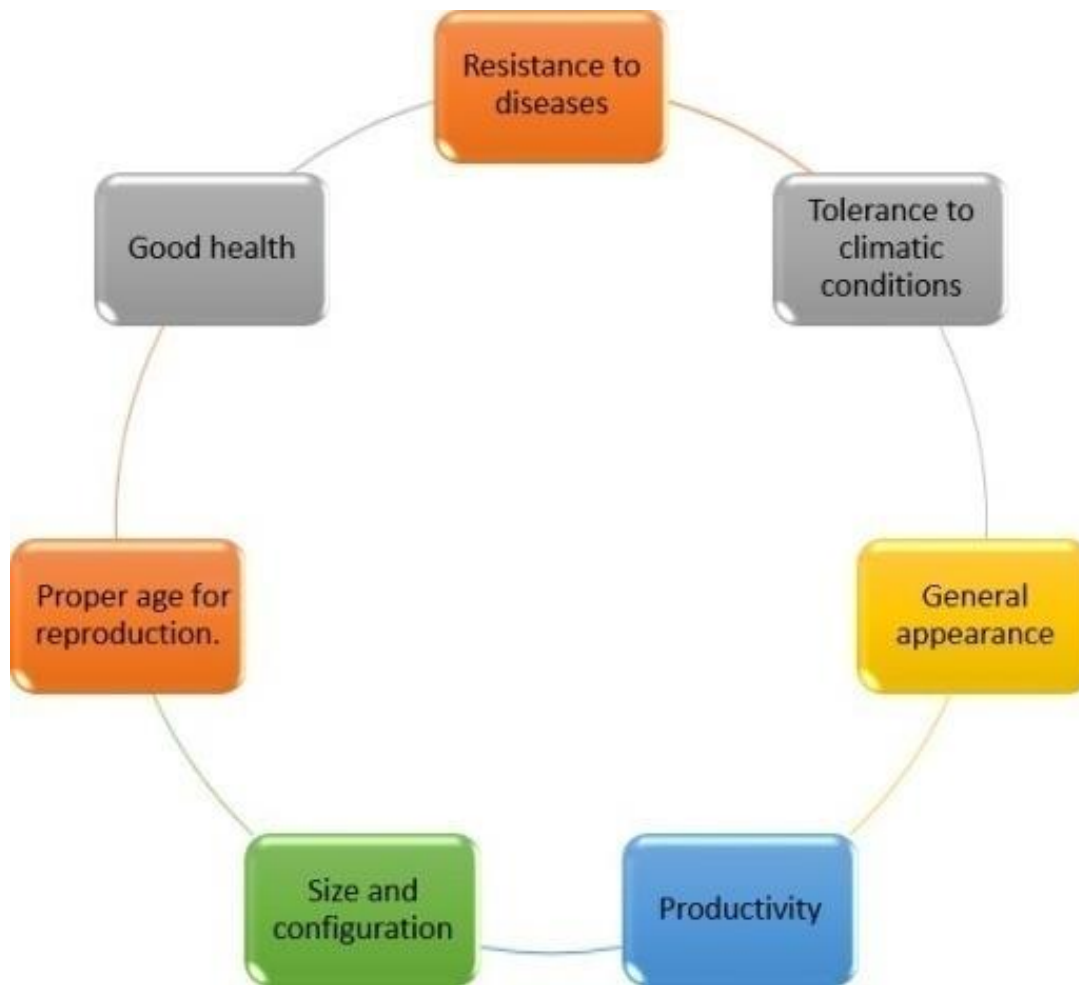


Proper Breeding of Animals:

Hybridisation is the natural or artificially induced crossbreeding of two different but closely related varieties of species of animals.

The new variety or species that results from the cross breeding is termed a hybrid.

The characteristic features of animals which should be taken into consideration for breeding are :



The application of genetic principles (cross breeding) improves economically important traits in domestic animals. Examples are improvement of milk production in dairy cattle, meatiness in pigs, feed requirements or growth rate in beef cattle, and egg production in chickens.

Proper feeding:

All animals must be given sufficient food, to put on weight.

An animal that is raised for meat must grow fat quickly. So feed supplements must be given. Animals must be fed and given feed supplements:

- at the same time every day, so that the animal can digest it.
- all the year round.

Provision for clean drinking water:

All animals must be given good quality water. Water helps in digestion, waste removal and the absorption of nutrients.

The daily water requirement of animals varies and is different for different species. The animal's size and growth depends on daily water intake. The amount of water an animal consumes depends on air temperature, relative humidity and the level of animal exertion or production level. The quality of the water, for example the temperature, salinity and impurities affecting taste and odour, of the water will also have an effect. The water content present in the animal's diet will influence its drinking habits.

Proper shelter:

Animals should be kept in a hygienic manner with proper housing.

- Animals and their sheds have to be cleaned regularly.
- Animals should be washed or bathed regularly to remove the dirt and bugs in their body.
- The shed should be well-ventilated and roofed so that animals are protected from rain, heat, and cold.
- A proper drainage system should be there to remove their waste.

Prevention and cure of animal diseases:

The most important element of animal husbandry is to have disease-free breeds. Animals are also subjected to many diseases. This may affect the health as well as productivity of animals; even cause their death.

Parasites, bacteria and viruses are the ones that cause diseases in animals. These microbes infect the animals externally as well as internally. Vaccination is the one solution for the protection against bacterial and viral infections.



Why do we need animal husbandry?

1. Growing population needs food for survival. Animal husbandry takes care of the growing needs of the population.
2. Animal husbandry includes many occupations such as poultry, cattle farming, fish farming and apiculture.

Image source:

<https://pixabay.com/photos/mammal-farm-animals-agriculture-3305320/>

<https://pixnio.com/science/veterinary-medicine/clinician-is-bleeding-a-horses-jugular-vein-to-test-it-for-the-arboviral-disease>

<https://pixnio.com/science/veterinary-medicine/man-assists-with-the-calving-process>

Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Main Script	Food & its production	Animal husbandry-Meaning

17. DD_ Caring for our cattle

Caring for our cattle



CATTLE FARMING means the raising of cattle or cows and buffaloes from their birth up to the point when they become fully developed to produce food and milk for our use.

There are over 800 breeds of cattle that are recognised all over the world. India has around 37 pure cattle breeds.

Here are a few to mention .

1. Gir Gujarat -

- Known for their milking ability - It has a higher yield of milk.

2. Sahiwal Punjab , Uttar Pradesh & Haryana

- Primarily used in dairy production - Easily identifiable from their prominent red colour.

3. Kankrej Bhuj , North Gujarat & Rajasthan.

- Largest cattle breeds in India.

4. Vechur Kerala -Low milk yield .

- They are among the smallest cattle breeds in India.

5. Kasaragod dwarf cattle

- Kerala -Known for their mineral rich milk.
- Red Sindhi Sindh -Widely kept for milk production

All the daily needs of the cattle are taken care of in a farm.

Shelter and food requirement:-

The cattle basically need adequate food, water, air, shelter & proper treatment.

- A shelter is constructed using materials such as cloth , corrugated iron or timber.
- Shelter facilities include well ventilated roof sheds which protect the cattle from rain, cold and sun.
- Cattle should be protected from diseases. Shelter should be cleaned and disinfected regularly.



- Feeding of cattle includes supply of uncontaminated and balanced diet.
- Diet includes roughages and concentrates.
- Roughage - High fibre content and low in total digestible nutrients like grass, straws, grazable pasture etc. They provide the cattle with the energy .
- Concentrates -Low in fibre and high in digestible nutrients like grains, wheat bran, soybean meal etc. They are high in protein content and add to body weight.

Veterinary Care:-

Cattle should be kept free from diseases in order to maintain a high yield. A vet visit to the shelter is a must once a month. They provide the cattle with all sort of vaccines at appropriate times. Thus, through scientific and systematic management of cattle farms, strong and healthy cattle are raised. Good quality and increased production of milk too is obtained.

Image source:

Cow: SSSVV Gallery

Grass: <https://pixabay.com/en/food-eat-grass-cow-animal-1516975/>Clinic: <https://www.publicdomainpictures.net/en/view-image.php?image=279491&picture=animals-clinic>

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Day-to-day Relevance	Food & its production	Cattle farming, Animal husbandry & Definition

18. QA_Crop Production and Management – A Recap**I. Give two example of each**

a) Kharif crop _____ b) Rabi crop _____

Suggested Answer: a. Tea, Maize b. Wheat, Oats**II. Write a paragraph in your own words on each of the following**

a) Preparation of soil _____

b) Sowing _____

c) Weeding _____

d) Threshing _____

Suggested Answer:

a) This is the first step in growing crops. The soil is turned and loosened so that the soil is well aerated and all the nutrients are mixed properly.

b) Sowing: Scattering of seeds is called sowing.

c) Weeding: Removal of unwanted plants is called weeding.

d) Threshing: Separating grains from the straw is called threshing.

III. Fill in the blanks:

1. Earthworms are known as _____ because of their burrowing habits.
2. Kharif crops are grown in _____ season.
3. _____ compete with the main crops for nutrients.
4. _____ is the tool used for manual method of removing weeds.
5. _____ are commercially available plant nutrients.

Suggested Answer:

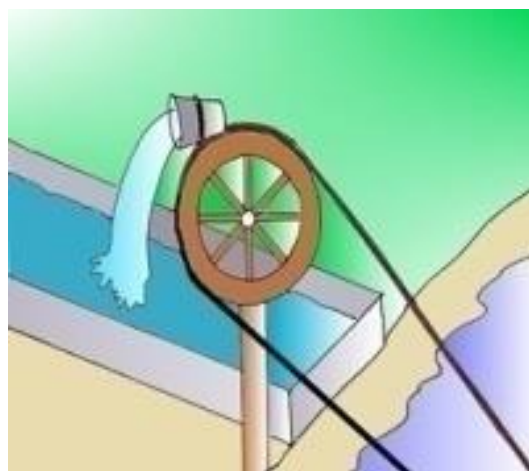
1. Farmers' friend
2. Rainy
3. Weeds
4. Khurpi
5. Fertilisers

IV. Match the following columns.

1. Fowl	a Rabi
2. Wheat	b. Irrigation
3. Harvesting	c. Weed
4. Amaranthus	d. Manure
5. Decomposition	e. Sickle
6. Moat	f. Poultry

Suggested Answer:

1. Fowl	a Poultry
2. Wheat	b. Rabi
3. Harvesting	c. Sickle
4. Amaranthus	d. Weed
5. Decomposition	e. Manure
6. Moat	f. Irrigation

V. Name the different methods of irrigation :

**Suggested Answer:**

- moat
- Chain pump
- Dekhli
- Rahat

VI. Answer the following questions:**1. What are the needs of the farming community to get the best out of agriculture?****Suggested Answer:**

- good quality crops.
- irrigation system.
- advanced technology.

2. What is meant by organic farming? What are its benefits?

Suggested Answer: Organic farming is a method of producing crops without utilising pesticides, fertilisers, genetically modified organisms, antibiotics and growth hormone. It aims to reduce pollution and create a healthy environment.

3. What are the commercial benefits of soil?**Suggested Answer:**

- Soil provides structural support for buildings, gardening, landscaping, etc.
- Forests being a good source of wood for various purposes, survive in favourable soil.
- Organic fertilisers are commercially used for better cultivation.
- Soil is the basic raw material for building materials like brick, slabs and utensils made of sand and clay.

4. What is meant by cattle farming?

Suggested Answer: Cattle farming means the raising of cattle or cows and buffaloes from their birth up to the point when they become fully developed to produce food and milk for our use.

VII . Say true or false

1. Xanthium and Parthenium are not weeds.
2. Weeds can be controlled by chemicals.
3. In drip irrigation systems the water is supplied using pipes to one or more central locations within the field.
4. Threshing is done with the help of a machine known as Combine.
5. Sowing is the first step in crop production.

Suggested Answer:

1. False. Xanthium and Parthenium are commonly known as weeds.
2. True
3. False In drip irrigation the water is supplied directly to the roots of the plants.
4. True
5. False Preparation of soil is the first step in crop production.

Image source:

Grass layered - <https://openclipart.org/detail/243741/grass-layered>

Grass - <https://openclipart.org/detail/84037/grass>

Other graphics – original contribution - radhika.bala@gmail.com

Original contribution - radhika.bala@gmail.com

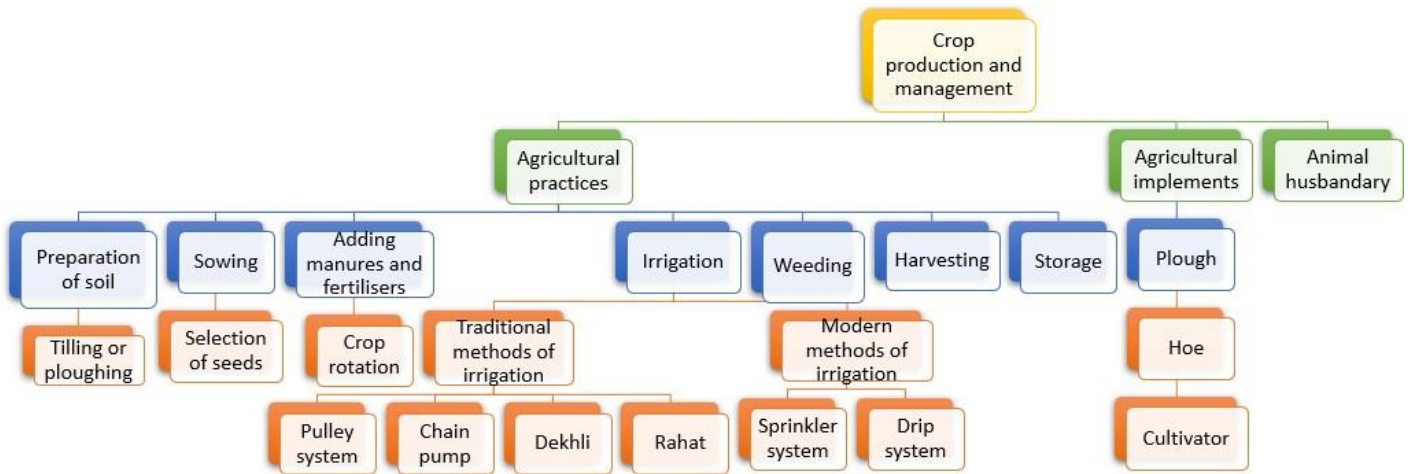
Original contribution – radhika.bala@gmail.com

Background sky and field: <https://pixnio.com/flora-plants/crops/clouds-blue-sky-agriculture-crops-wheat-landscape-summer>

<https://commons.wikimedia.org/wiki/File:Irrigation2.jpg>

Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Assessments	Food & its production	Storage of grains, Sowing, soil nutrients, Preparation of soil, Manure, crops, Irrigation, Fertilizers, improvement, Crop production management practices of crop production implements, Adding manure

19. MS_Summary_Crop production and Management



Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Food & its production	Storage of grains, Sowing, soil nutrients, Preparation of soil, Manure, crops, Irrigation, Fertilizers, improvement, Crop production management practices of crop production implements, Adding manure

Master Lesson Plan

Seven Asset Methodology for MLP	
What is the purpose of this Master lesson Plan?	This Master Lesson Plan (MLP) prepared by Sri Sathya Sai Vidya Vahini, covers the entire chapter for the given board. The chapter given in the textbook is broken down into smaller modules known as assets. One of seven teaching methods is applied to each asset. Several different assets together complete the entire chapter. Each asset is supported by a teaching aid such as animated presentation, audio, video, worksheet; that the teacher can use in the class, while teaching that module. The MLP is for the teacher's preparation and the teaching aids are for use in the classroom.
How to use it?	You can prepare for your class with this MLP by following 3 simple steps:1. Read your textbook; 2. Go through the information given in the assets (document & multimedia); 3. Prepare your teaching notes. Great! Now you are ready to transact the chapter.
Duration	Kindly note the duration given for each asset. Due care has been taken in planning the assets, to ensure the chapter is completed within the time specified by the Board. Note: Preparation time is not included in the asset duration. The teaching time depends on the duration of the teaching aids and is not impacted by the length of the MLP.
What is a 'Main Script' (MS) Asset?	The Main Script asset is there for explaining the main concepts of the chapter clearly. The information given in the textbook is simplified, organised and structured to give more clarity. Additionally, you may find a video or mnemonics or a graphic organiser to deepen the understanding of the concept.
How to teach using the MS asset?	Please use the blackboard, slides and interaction to develop the concept.
What is an 'Inquisitive Questions' (IQ) asset?	The Inquisitive Questions asset uses questions to promote higher order thinking like the n th why, what-if, new perspectives, cause-effect, and others, creating curiosity.
How to teach using the IQ asset?	You may use the questions to connect with the students, encourage exploration to engage them in the learning process. You may allow multiple responses and instead of rejecting any of the responses, ask why, before revealing the suggested answer or hints.
What is a 'Day to day Relevance' (DD) Asset?	The Day to Day Relevance asset helps students understand the practical relevance of every topic, making them eager participants in the classroom. If students connect the concepts to their environment, they would learn meaningfully without dislike or simply memorizing for exams.

How to teach using the DD asset?	You may use the asset by asking questions about their experience and use it to establish why they are learning the topic. If necessary you may substitute with a recent or local example.
What is an 'Interesting Aside' (IA) asset?	The Interesting Aside asset uses attention grabbing tidbits or anecdotes to bring joy and satisfy the child's hunger to know more. This is a quick/short asset intended to bring attention back to the main concept being taught.
How to teach using the IA asset?	You may use this asset to give a piece of interesting information relevant to the topic, without prolonged explanation/discussion. You may suggest appropriate books for further reading.
What is a 'Suggested Activity' (SA) Asset?	The Suggested Activity asset provides a detailed step by step procedure for the teacher to conduct a hands-on activity. This promotes Activity Based Learning.
How to teach using the SA asset?	You may use this asset to energise your students to learn by doing simple, fun-filled activities based on the topic. The asset includes - preparation, activity, and follow-up. You may engage the students in the preparation and follow-up stages to develop collaboration and responsibility. You could try it once, yourself, before the actual delivery to be more comfortable with it. Note: The duration mentioned in the asset is usually for the activity part only.
What is a 'Value Content' (VC) Asset?	The Value Content asset integrates Universal Human Values (such as empathy, inclusivity, respect for nature that translates into responsible behaviour) seamlessly into the curriculum, as the "End of education is character".
How to teach using the VC asset?	You may use this asset to engage with the students to bring out their innate values and connect with the intrinsic values in the topic/concept. The asset includes pointers on the specific pedagogical technique followed.
What is a 'Questions to Assess' (QA) asset?	The Questions to Assess asset uses an interactive approach to check learning of different types of learners, and provides feedback to the teacher for appropriate action. The questions cater to all the levels of Bloom's Taxonomy. Questions from 'Apply' level and above enable students to reflect on their learning.
How to teach using the QA asset?	You may go through the slides to understand its flow and know when to click for the answer (slides include suggested answers). While presenting in the class, you may display the question and encourage multiple responses, before revealing the answer. In some cases, this asset may include extra questions/worksheet that can be given as homework.