

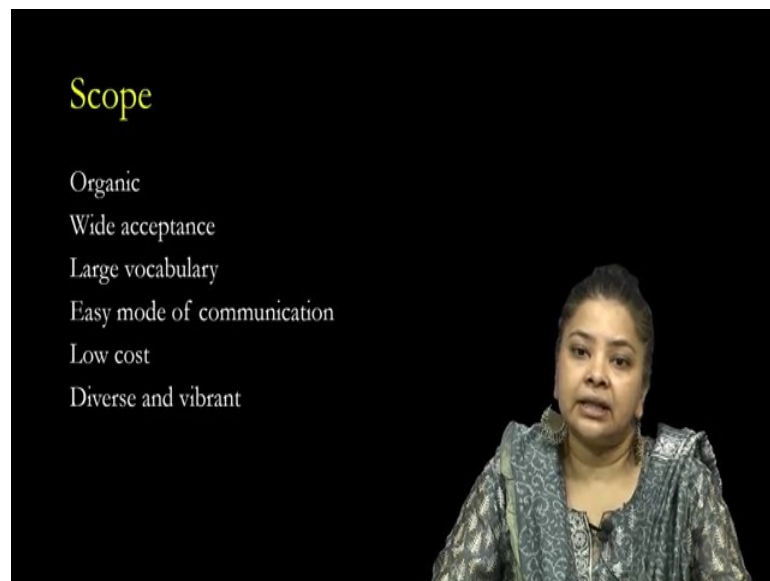
Autistics Exploration in Scientific Research And Technology
Dr. Bitasta Das
Department of UG Humanities
Indian Institute of Science, Bengaluru

Lecture – 20
Representation of Science and Technology with Indian Folk Art 1

Hello friends, after having discussed the necessity to convey a dialogue between the arts and the science and technology. Today let us see whether the folk arts of India has the potential to convey science and technology effectively.

In this class, we will discuss what are the scope of Indian folk art and whether they are able to convey and communicate science and technological discoveries effectively. So, Representation of Science and Technology with Indian Folk Art.

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So, what are the scope of Indian folk art? What do they entail? And what do they mean for the general public? They are organic as we have already discussed in the previous classes, they come out from the community themselves; they are from the community themselves, the community themselves build this kind of art. So, they are organic, they are inbuilt, they are from the community themselves. Because they are organic, because they are created by the community themselves, because they born from the community themselves they are widely accepted, and they have a wide recognition.

They have a large vocabulary. We have seen in the previous classes that Indian folk art has the ability to communicate and convey a large range of things from worldly philosophy to day-to-day matters from emotions to angry, love, hatred. They have a large vocabulary, they are able to express a lot many things and not many topics at once.

Easy mode of communication. We have seen that it is very easy mode of communications its direct, it is from one person to the other. So, there is nothing in between, so they are very easy and they are very lucid mode of communication and to convey things that the person wants to convey to the other.

Low cost. Most of the folk art are a very low cost. We have seen that they are built by the community themselves and they have very minimum mechanical aid, very minimal things from outside. They are done from whatever is available around them. So, they very low cost.

They are vibrant and they are diverse. We have seen that India is full of different kinds of folk art. They are very vibrant, they are very lively and they are very diverse. One folk art is different from the other, though thematically they might be similar like we are seen in Madhubani and in other in wall art, they might be thematically similar, but they have a different kinds of representation, they have different kinds of execution. So, that they are diverse across the country and their very very lively and vibrant, they are alive.

So, these are the few scope, that I have mentioned that that folk art are able, they have until this many things they contain this many things. So, these are the strength of folk arts.

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So, I must tell you once again that in this course we are not trying to simplistically represent science and technological discoveries and advances using folk art, but what we are trying to do is something more than that. We are trying to create a dialogue between the folk art of India with science and technology, that is to say that both this domain of knowledge are at par with each other and none is less from the other. So, it is not too simplistically represent science and technology through Indian folk art, but to demonstrate that there is possibility of the two domains to have a dialogue with one another.

And they can be at par with one another, they can be like equals and they can have things that they can share or they can have a dialogue, they can know borrow from one and share with the other. So, these are the things that we trying to do through this course.

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So, let us now discuss forms of folk art and their strength. What are the different forms of folk art we have and what are the strength of each of them? One is narrative we have already discussed. Narrative are the one which are said from the mouth, they are the words of the mouth and more often than not there not written down there just passed on from one generation to other generation by the word of the mouth. They can be riddle, they can be idioms, they can be songs, they can be phrases, there are jokes these all narrative folk art.

Performative. So, dance, drama, then sometimes theatre forms, these are all performative art. Nowadays, many of the martial art forms also performative art. Visual art. We have discussed this in extensively. Visual arts are the painting, the sculptures and anything that is tangible can also be a visual art.

So, what are the strength of this different folk art form?

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Narrative: easily comprehensible, many times they are explanatory, few narrative art such as riddles and idioms encapsulates deep philosophy in short precise manner. They are lucid and relatable.

Performative: They are vibrant and captivating. These art forms are enchanting and easily reproducible.

Visual: Often are appealing, the vocabulary contain large scope of representing wide topics and ideas.

So, the strength of narrative folk art is that they are easily comprehensible, the language is very simple, they are not meet complex, they are not made unnecessarily complicated. They are very simple, they are easily understood, they have simple worded, they have simple expression. So, that the person trying to convey a thing can easily convey to the other without much problem.

Many time they are very (Refer Time: 06:08) explanatory. We have seen that phrases and riddles and all, they are explanatory they tell you a lot of things, they, they convey a lot of things and they explain what it means. So, we can site and example of an idiom like [FL]. That means, the do the things which supposed to be done later do it now, finish it now so that you can respect time you can give importance to time. Only if you give importance to time you will rise in life. So, these are the things that are very simplistically told this so that the listener is able to understand easily. So, this is one of the strength of a narrative folk art.

Few narrative art such as riddles and idiom encapsulate deep philosophy in short precise manner. So, you must have have; you must be having examples from your own culture, like there would be some riddles in your own language in your own culture, and there would be idioms, phrases which has a lot of deep meaning, deep philosophy. But they are told to very simple manner, so that you understand a lot of things in a very precise and a very crisp manner. So, this is one of the strength of a narrative folk art.

Then lucid and relatable. these things are very related to know if you can relate to them, when somebody talks about time and somebody talks about goodness, when somebody talks about kindness, when somebody says that do not rob others or whatever you do to others will come back to you. These are very relatable and there very easy to understand. You understand them very easily and it can be applied to your day-to-day life. So, these are few of the strength I have mentioned about narrative folk art.

Then comes performative. They are very vibrant and captivating. You must be having examples from your own culture, that the performative arts, a very lively, very captivating. If you see a dance you feel like dancing yourself, if you hear a song, if you see a drama you get totally engrossed in it. So, they very captivating they very vibrant and they are able to hold the attention for a long time.

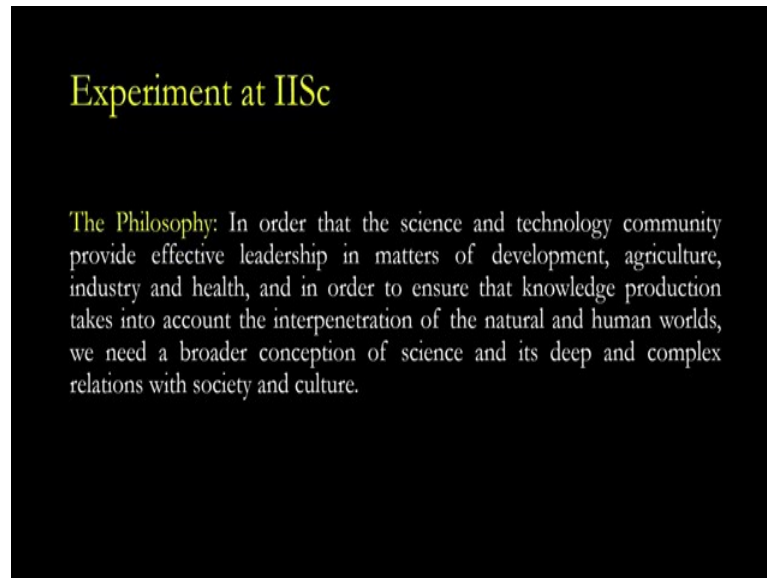
This art forms are enchanting and easily reproducible. You might be have seen if you are staying in town it might be little difficult, but if you have seen it in if you are living in the little rural area in might see that many of the dances, the performances, the entire village or the entire community participated, it is not the performer and a observer, everyone is a performer there. So, it very easily reproducible. You can pick up the dance move very easily because it is the community activity. So, they are very enchanting, you feel like joining yourself looking at them you feel like trying the dance move yourself. So, these are another, these are few other strength of performative folk art.

Then visual; often they are very appealing. We have seen many many folk art from our country they are very appealing. They are, take it able to catch your attention you get very attracted to them. They are vibrant colours sometimes, sometimes they are very figuratively they are very nicely placed, sometimes they are very that are very intriguing. So, they are very appealing to you. Whenever you look at the visual art you get attracted to them.

The vocabulary contain large scope of representing wide topics and idea. So, as we have seen in the previous classes, we had discussed many folk visual art, folk paintings from India and we have seen that many this art are able to represent or to convey many different meanings at one time. So, we have seen how like during a birth this paintings are done that is to say that, we have invoking blessings from the gods or sometimes you are talking about whatever is found nearby, whatever is found, the flora and fauna you

are talking about that or sometimes you are talking about deep philosophy, sometimes you are talking about god, sometimes it is symbolically showing what is important to the community life. So, they have a large vocabulary which is, this is why they are able to represent a lot many different and diverse topics to them. So, this is a strength of visual folk art.

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So, now I want to discuss a little bit about what is the, what are the kind of experiments we are doing and the Indian institute of science, with science technology at one hand and art Indian folk art and other. So, the experiment of at Indian institute of science is that the humanities course of the undergraduate program. The philosophy behind is it that with the value designing this courses with the we had a philosophy in mind. We thought it is not always advisable not always clever to designed the humanities courses as distance from the science and technology which the students are learning. But they have to have a synergy with one and other, they have to have a free flow with one and other. So, this was the kind of thinking that we had put while we were designing the courses.

So, the philosophy was that in order that is science and technology community provide effective leadership in matters of development, it is a some examples development, agriculture, industry health. And in order to ensure it knowledge production takes into account interpenetration of natural and human worlds, we need a broader conception of science and its deep and complex relation with society and culture.

We often think that science and technology has nothing to do with society and culture, scientists are not they are removed from the society, but we have to change this notion in some point. And so, this courses when we are developing the humanities courses of undergraduate program. We wanted to have a synergy, we wanted the humanities and the social science to have a dialogue with science and technology. So, this may some of the thoughts that were there, that we have to give importance to the interpretation of the natural and the human world and we have to say that the science and technology has a very deep and complex relationship with society and culture. This were things that we were keeping in mind well designing the course.

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So, I want to discuss bit about the mapping India through the folk art course. So, this is a course that is talked to the undergraduate students.

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So, as part of this course what we try to do is, we try to understand India not by the written word, not by text, but we try to understand India through the vibrant folk arts. So, every year we discuss the different art form, it might be visual art in one year, it might be performative folk art in another year, it might be a narrative art in the other year. So, we take a different form of a folk art and we see its continuation and diversity across the country.

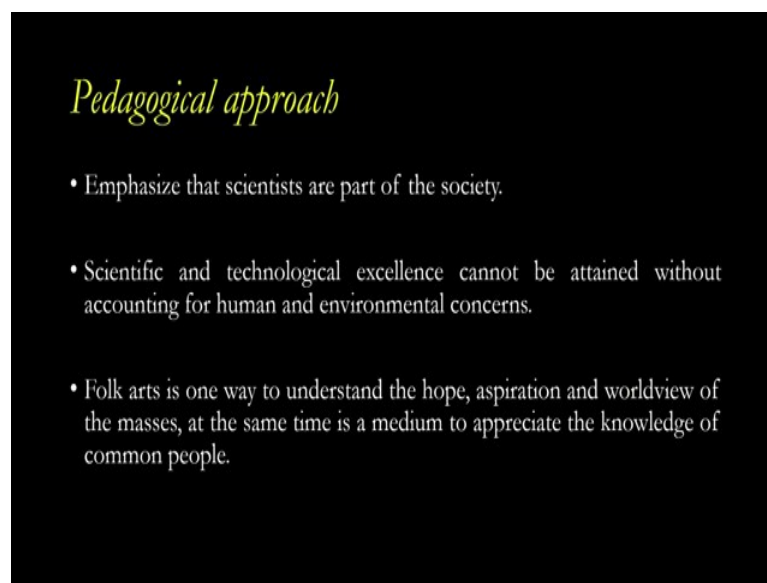
So, this is how we try to understand the country by looking at the folk art. So, as I had mentioned earlier that we see the folk art as not something that is trusted upon the community, but they are born from the community themselves. So, they are very, they talk a lot about the world view of the community, they talk about their hopes and aspirations, they talk about the values, they talk about the world view. So, looking at the folk art we try to understand the community from inside out not outside in. So, we try to understand the community from their own perspective. So, this is what we try to do in this course. That is to understand India through looking at the Indian folk arts. So, understand a nation little better by understanding the folk art. So, this is what we try to do in this course.

As a corollary of this course what we try to do every year is to build a synergy between the Indian folk arts and science and technology. So, every year the students themselves take up the responsibility of representing something related to science and technology,

and using folk art as a medium. So, this is again not to say that we are just using the folk art as a medium of expression as a medium of communication. But, we are trying to explore that does the Indian folk art have the ability, have the vocabulary, have the, scope of having a dialogue with science and technology, whether they have enough tools use to talk about science and technology effectively. So, the experiment has been fairly successful, we have been able to produce a lot of artifacts through this course.

I will give an example, few of the examples in the subsequent slides.

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So, what is the pedagogical approach? Again, we have, we are reading a very delicate terrain, while we are trying say that we want to have a interdisciplinary course, we want to have a we want to establish a dialogue between folk art and science and technology; what should approach have like should we what are the things that we should keep in mind while designing this kind of a course. a very often and not, it sometimes the art as just reduced to amusement, we were very careful about this, we were careful about that they are not reduced to just mere source of amusement or entertainment. But we should take them seriously as they as a heritage of a community.

Also, while doing this I tell the students and I am telling you also again and again that if you want to practice a folk art you are most welcome to do, but we must not assume that person just can become an expert in folk art. the fork artist take generations of the generations, they learn it through observation, it is a part of the cultural identity. And

and outsider can just have a taste of, it is just have a try it but we cannot claim that have become an expert in the art.

Having said that I should also give, you should also take note that folk art a very flexible, they are very inclusive, and they are very accommodating. So, one can try an understand an take part in the folk art, but we should keep in mind that we do not become expert, we are just people who appreciate them, we are admires of the art, and we can just try our hand sometimes, but we cannot become expert unless and until we have lived in the community and we have been part of the cultural life.

So, what is the pedagogical approach that we apply while designing and teaching such a course? We emphasize that science is a part of the society. So, I am we are teaching this course to students who are doing science. So, we have to emphasis that scientist are not removed from the society, but they are part of the society. They cannot be blind towards the societal , whatever is happening in the society or whatever is happening around them, but they have to live in the society, so they are part of the society and they should be aware of what is happening in an around them.

Scientific and technological excellence cannot be attained without accounting for human and environmental concerns. So, one cannot become a great scientist or we are technological expert unless and until he or she takes into account the societal necessities or the environmental concerns. More and more it is felt that unless and until you take care of the environmental concerns and environmental issues we will not go anywhere. We have seen that we have already done so much of damage to the environment, science and technology has been part of the damage to certain extent.

So, one should be; the cognizant of this one should be aware of this that whatever we are doing should not be harmful to a environment, should not be harmful to the human race. So, scientific and technological excellence cannot be attend without accounting for human and environmental concerns. So, these are the things that I tell my students when we are discussing such the issues.

So, these are the few approaches that I have applied while I was designing and while be execute the code while we are teaching the course.

The third is folk art is one way to understand the hope aspiration and worldview of the masses, and a same time it is a medium of to appreciate the knowledge of common people. So, as I have told you earlier that we see folk art as a knowledge, as a heritage of the community. It is a heritage, it is a cultural expression of the community. So, it we see this as the knowledge base of the common people. We see folk art as a window to understanding hope aspirations and world view of the common people.

So, these are three pedagogical approach that we have applied while designing such a course. It is one of the pioneer course, so the things are to be in a thought about. And I want to also emphasis that in this course also we want to have this kind of approach that we have science and technology should have a relationship with this society and culture.

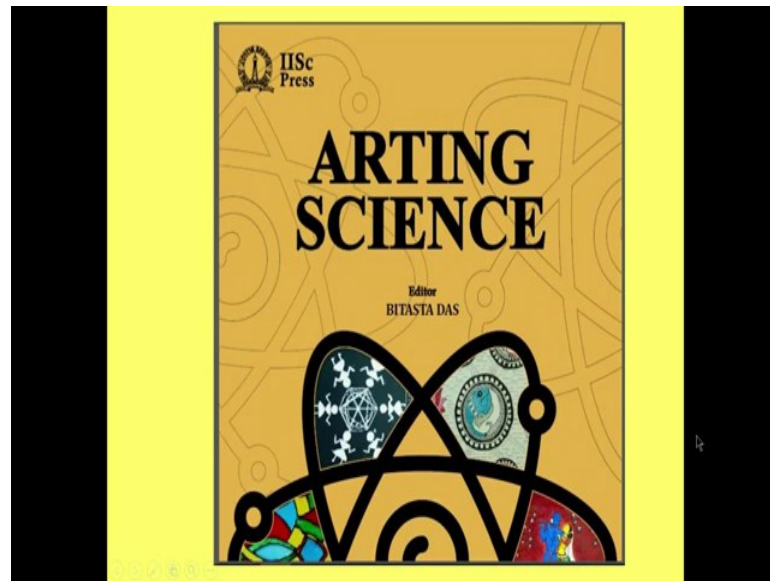
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So, as part of the course as I have mentioned to you that arting science is domain that the students are creating year after year. So, in the domain of painting, music, theatre, dance, so we take up one folk art form every year and this through this form we try to understand the country. And at the end of the course the students create a artifact which tries to establish a synergy between the science and technology at one hand and Indian folk art at another.

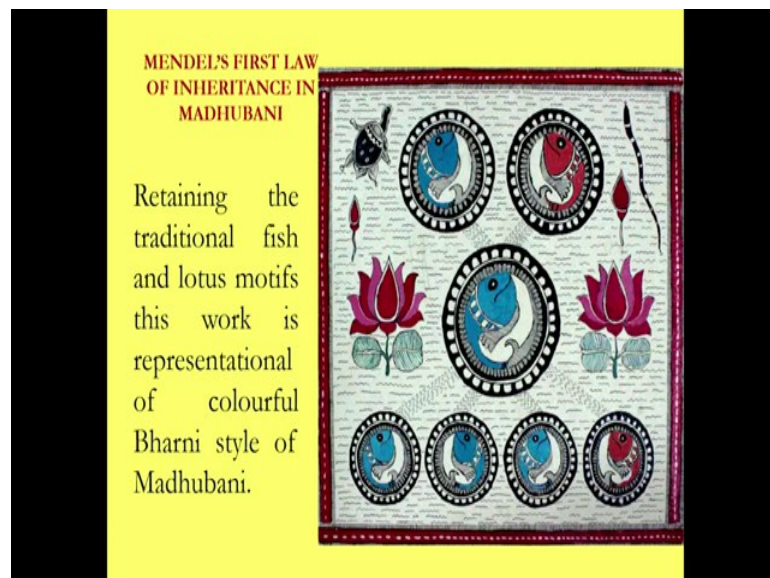
So, far we have done paintings, music, theatre, dance and sometime we have done (Refer Time: 21:52) things, like we have in one year we have done ecology. So, in subsequently I would like to show you some of the examples from them.

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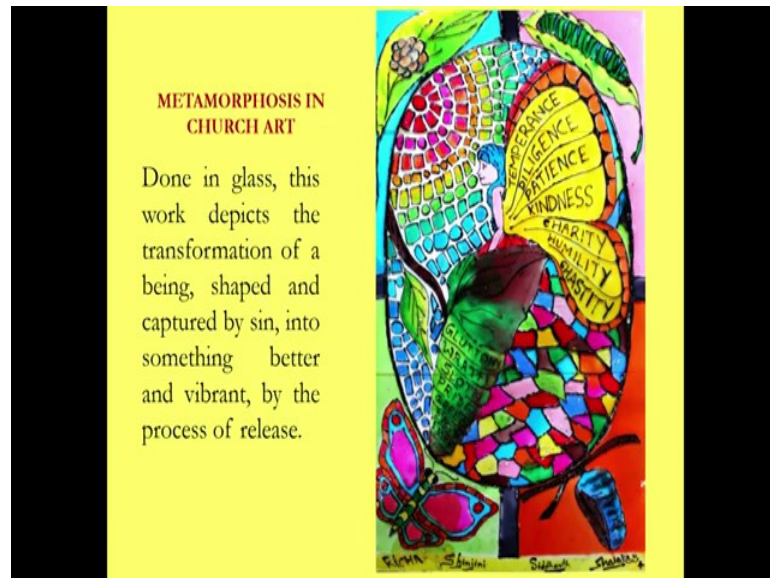
So, I have told you in the previous class also that this is a book that we have published in the year 2016, we call it Arting Science. So, this was the year when the students, the UG students of Indian Institute of Science, the 2012 batch they were asked to represent a scientific concept using any Indian folk art, any Indian visual folk art. And the paintings that the students are created was compiled in to this book and it was published in 2016 by ISC press.

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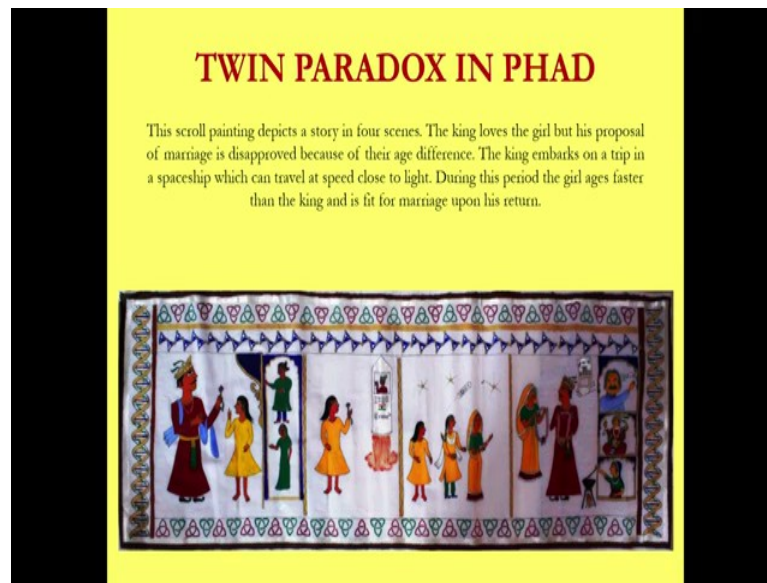
So, this is a Madhubani art. So, here the students are representing the Mendel's first law of inheritance in Madhubani. Retaining the traditional facial lotus motive this work is representational of colourful Bharni style of Madhubani. You have gone through the Madhubani class, so you might be able to relate it that the fish is a typical Madhubani style fish, and even the lotus is very common motive in Madhubani style.

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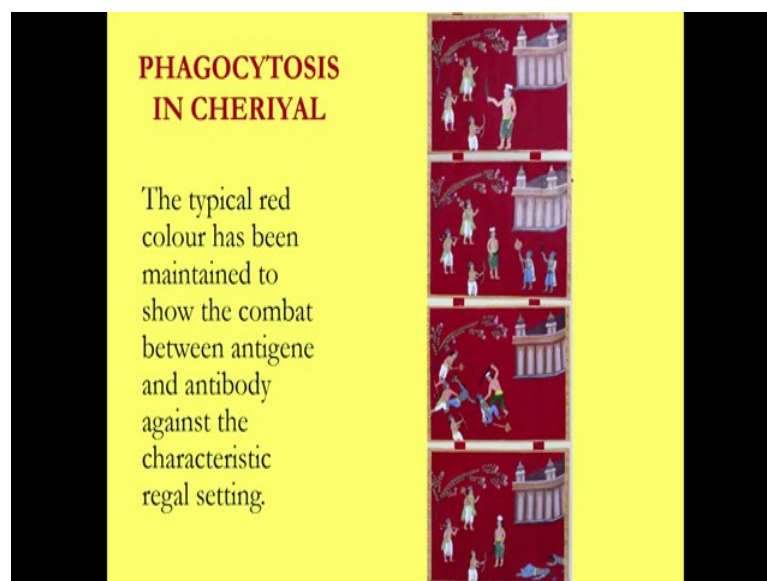
So, this is a Metamorphosis in church art style, done in glass. This work depicts the transformation of being, shaped and captured by sin, into something better and vibrant, by the process of release. So, you keeping the, ideas of the church teaching, this painting tells that one is able to change their inner self to something better every time.

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So, this is Twin Paradox in Phad, the scroll painting depicts a story in four scenes. The king loves the girl, but his proposal of marriage is disapproved because of their age difference. The king embarks on a trip in a spaceship and can travel, which can travel at speed close to light. During this period the girl ages faster than the king and is fit to for marriage upon his return. So, this is a very sweet representation; sweet story which is represented in Phad style and it is showing the time travel idea of science.

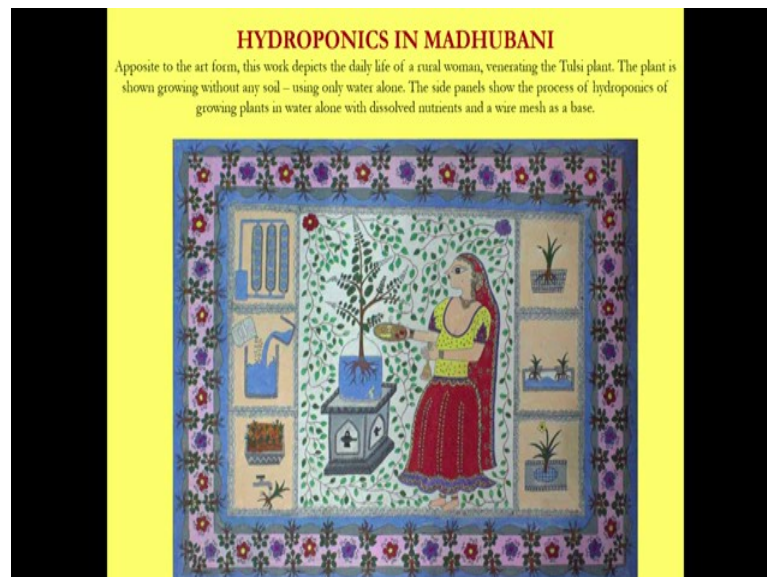
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This is Phagocytosis in Cheriya, you must have know learnt about phagocytosis in your school. The typical red coloured has been maintained to show the combat between antigen and antibody against the characteristics regal setting.

So, Cheriya style is painting style of Andhra Pradesh and Telangana, where the war scenes are depictive mostly between the king or the nobles of the kingdom with the enemies. So, and the background is often, not often it is always red. So, in this painting also the students have maintained the red background and they are showing the antigen, anti-body combat.

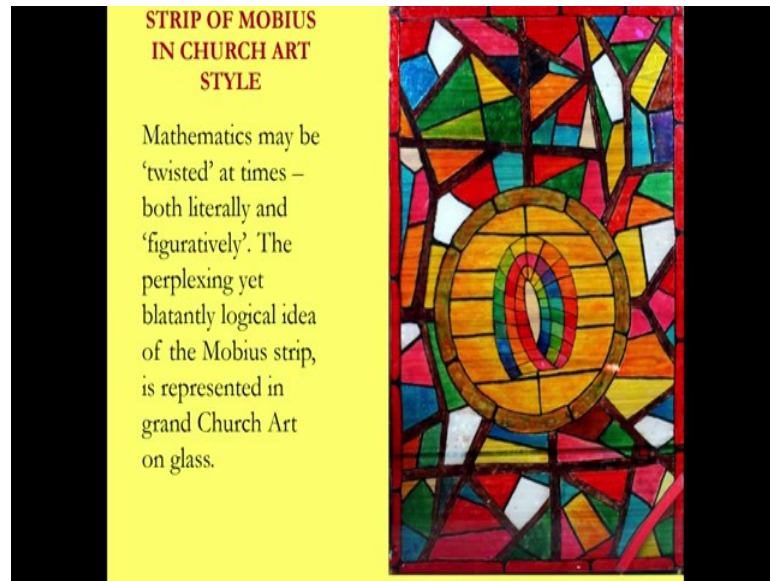
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This is again a Madhubani painting and they are showing Hydroponics. Opposite to the art form, this work depicts the daily life of; opposite of the art form this work depicts the daily life of a rural women venerating the Tulsi plant. So, Madhubani style as we have seen earlier that it depicts the, rural life, the rural values and the rural worldview.

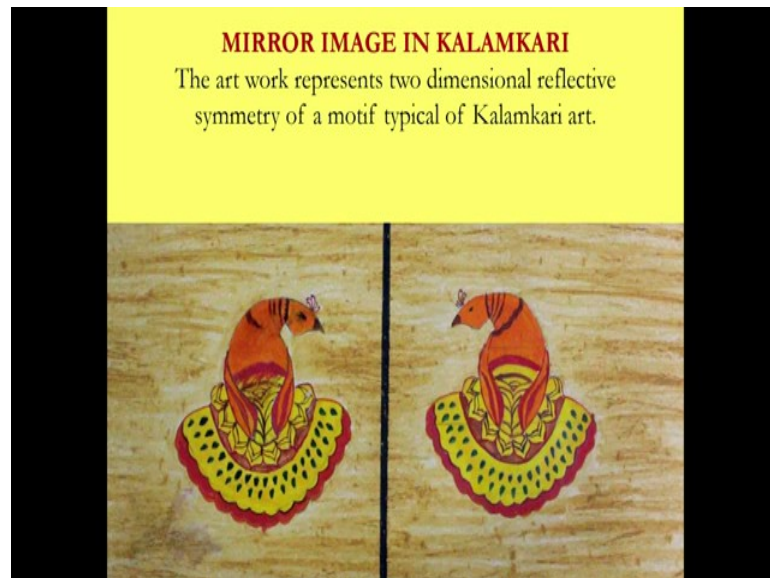
So, here also they are trying to show that how lady of a household is worshipping the Tulsi plant which is reward in Indian customs. The plant is shown going without any soil, using only water. In the side panel show the process of hydroponics of growing plants in water alone with dissolve nutrients and a wire mesh at the base. So, if you pay attention to the side panel their processes also shown how a plant can be grown without soil, but only with water and nutrients.

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This is again church art style. Mathematics maybe 'twisted' at times, both literally and 'figuratively'. The perplexing yet blatantly logical idea of the Mobius strip, is represented in grand Church Art on glass. So, this is representation of the Mobius strip in church art style.

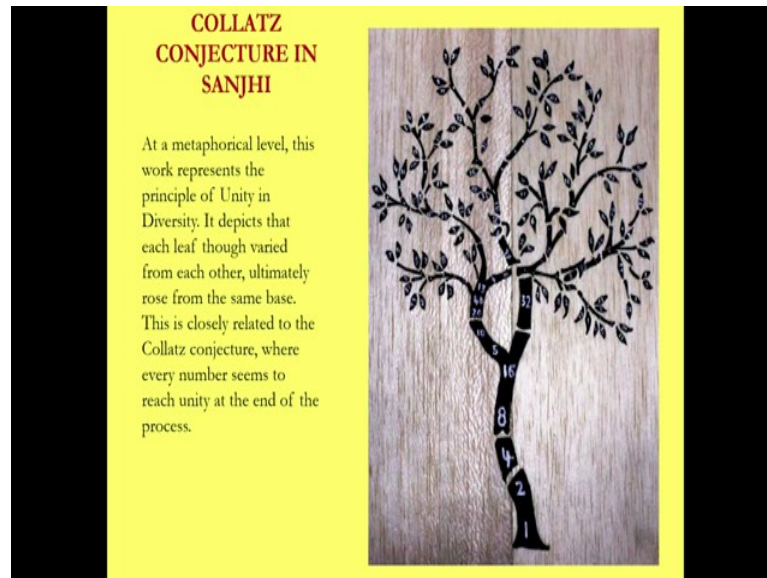
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This is Kalamkari of Andhra Pradesh and Telangana. The mirror image is shown here. The art work represents two dimensional figuratively; the art work represent two dimension reflective symmetry of a motive typical of Kalamkari art. So, this motive is

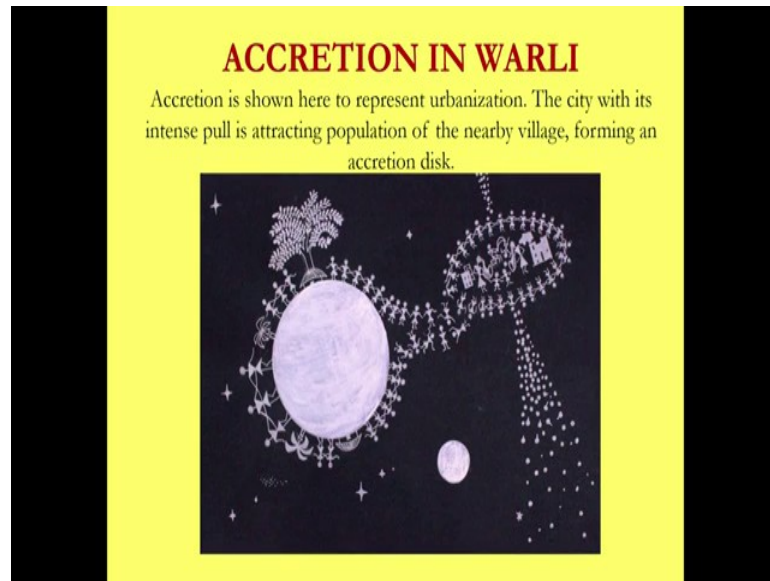
very typical of Kalamkari art. If you have come across Kalamkari you have you would have definitely come across such a motive. So, here they are showing the reflective image through Kalamkari art.

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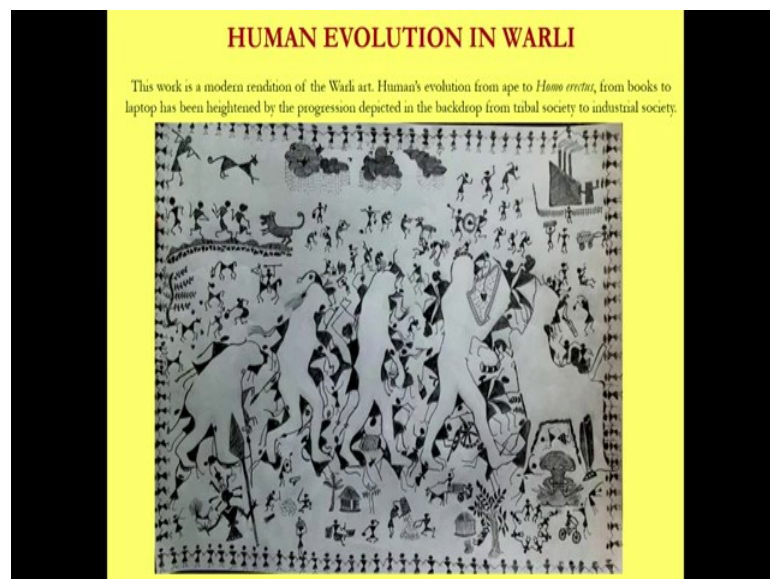
This is called as Conjecture in Sanjhi. At the metaphorical level this work represents the principle of Unity in Diversity. It depicts that each leaf through varied form each are though varied from each other, ultimately rose from the same base. This is closely related to Collatz conjecture, which where every number seems to reach unity at the end of the process. So, this is a complex mathematical theory which is presented in Sanjhi art style. Sanjhi art style is a paper cutting style popular in Uttar Pradesh area.

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This is Warli art and here we are showing accretion theory in physics. Accretion is shown here to represent urbanization. The city with its intense pull is attracting population of the nearby village, forming an accretion disk. So, here the accretion is shown that how organization pulls people from the rural areas and urban areas get more and more crowded. So, this is what it is shown in this Warli art.

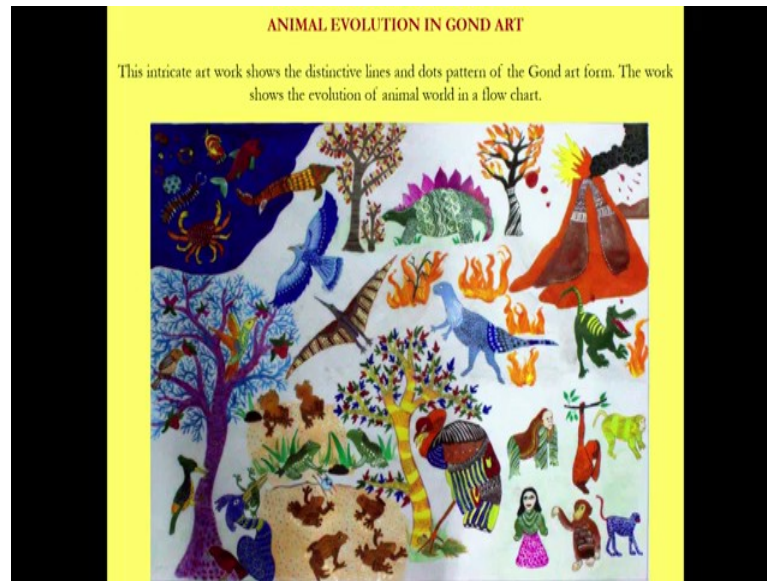
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This is again Warli art the showing human evolution. This work is a modern rendition of the Warli art. Human's evolution from ape to *Homo erectus*, from books to laptop has

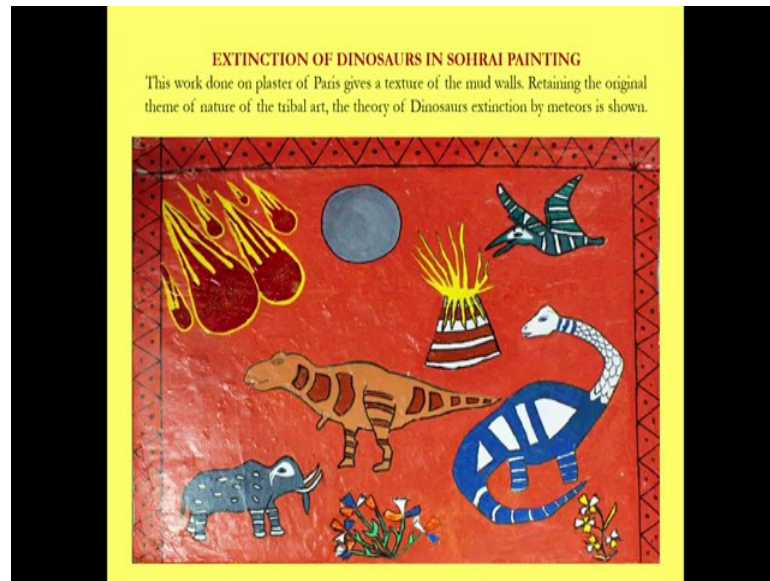
been highlighted, heightened by the progression depicted in a background from tribal society to industrial society. If you pay attention to the background you will see how the efforts showing the tribal society and how they have finally progressed to something what we call as modern and you can see nuclear explosion industrialization has happened.

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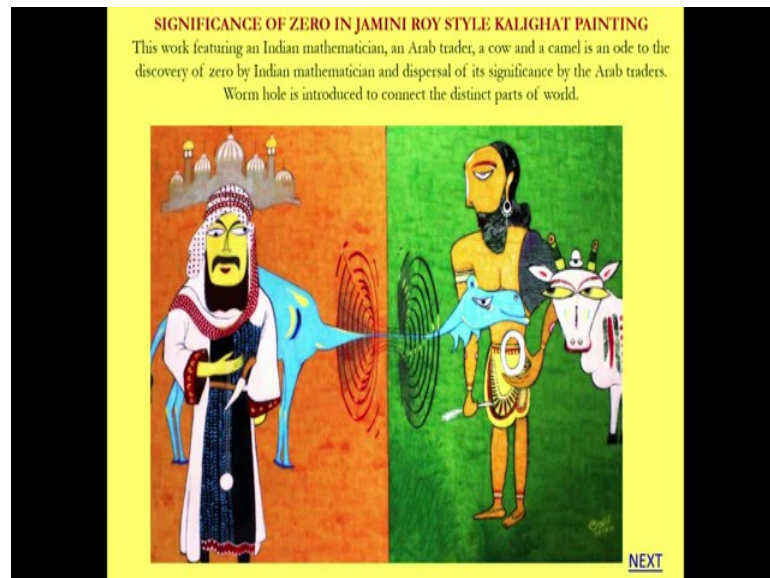
This animal evolution in Gond art. This intricate artwork shows in distinctive lines and dot pattern of the Gond art form. The art shows the evolution of animal world in a flow chart. So, this is shown in a flowchart how animals have evolved. It is done in Gond art style, very intricate designs, very intricate patterns are shown here. If you remember the Gond class that we have had, we have seen that the Gond art is represent with dots and lines, it is very typical representation of the Gond art style.

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Extension of dinosaurs in Sohrai painting. This work done on plaster of Paris gives a texture of the mud wall. Retaining the original theme of nature of the tribal art, the theory of Dinosaurs extinction by meteors is shown. So, this is giving you a feeling of the mud wall it is done in plaster of Paris and here the extinction of Dinosaurs is shown.

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Significance of zero in Jamini Roy style Kalighat painting. This work featuring an Indian mathematician, an Arab trader, a cow and a camel is an ode to the discovery of zero Indian mathematician and dispersal of its significance by the Arab traders. Worm hole is

introduced to connect the distinct parts of the world. So, it is said that the significance of zero was discovered in India and Arab traders have popularized it. So, here the wormhole, the concept of wormhole is introduced to show that how the two worlds are connected.

So, friends, today we have seen some of the examples from visual art. In the next class I would like to show you some of the examples from other folk art. We will show you examples from dance, we will show you examples from theatre, we will show examples from a music. So, this is to give you an idea that it is possible for Indian folk art to have a dialogue with science and technology. It is possible that Indian folk art can effectively present science and technology, and they can both have an exchange of ideas and exchange of concepts.

So, see you in the next class.