

Communication Design Project 2

Instructional design for 10th Graders on
3D drawing with a focus on

One Point Perspective.

Project by :

Stuti swamiwal
216450014

Project Guide :

Prof. Sudesh Balan

IDC School of Design
अभिकल्प विद्यालय



IIT Bombay

Approval Sheet

This Communication design project entitled "Instructional design for 3D drawing 10th graders with a focus on one point perspective" by Stuti Swamiwal, Roll No. 216450014, is approved in partial fulfillment of the requirements for a Master of Design Degree in Communication Design.

Project Guide:

 Prof. Indesh Bala.

Chairperson:

Internal Examiner:

External Examiner:

Date: 17th June 2022
IDC School of Design,
Indian Institute of Technology, Bombay.

Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included. I have adequately cited and referenced the sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/ source in my submission.

I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been appropriately cited or from whom proper permission has not been needed.

Stuti Swamiwal
216450014
Communication Design

18th November 2022

Acknowledgement

I am deeply grateful to my guide Prof. Sudesh Balan for providing invaluable guidance and constructive criticism throughout the duration of this project.

I wish to express my gratitude to the students and art teachers of various schools, which helped me in the research and gave valuable insights.

I would also like to express my warm appreciation to the faculty members of the College, friends and family for their kind cooperation and support during my project.

I am thankful for each and every person who has directly or indirectly helped me in making the project successful.

Content

Aim	5
What is Perspective Drawing	7
Current Scenario	8
Why this topic	10
Research	11
Common Insight	15
Topic	16
Design Decesion	17
Deliverables	18
Iterations	19
Instructional Manual	20
Further Steps	27
Future Scope	28
References	30

Aim

This project aimed to ignite children's curiosity and boost their confidence in art, especially in an area like 3D object rendering.

Perspective drawing is a tricky subject for newcomers, particularly those between ages 13 and above since, they just begin to learn complex problems that require spatial visualisation at that stage of their educational journey.

This project addressed this by making the perspective drawing instruction and learning more engaging, interesting, interactive, and easy to be taught in a school set up.

Art scene in india and schools



Schooling system Abroad



Art subject importance



Why are vocational subjects important

How can we make Students interested in art

New
education
policy



experientia
learning

Micro learning

Microlearning

Microlearning involves structuring learning materials into short and targeted segments that won't take more than 20 minutes to complete. A buzzword in the world of instructional design, it's deemed as one of the most effective ways to capture the attention of the millennial workforce, who are known for their short attention spans. Microlearning allows learners to absorb a small amount of information instead of reading a large number of modules or watching hour-long video lectures. And since this instructional design example won't overload them with too much content in just one sitting, it significantly results in higher learning retention and recall.

HISTORY of perspective drawing



Why perspective drawing is needed



- Personal interest and experience with KIDs



Why this project



Need
for the
project



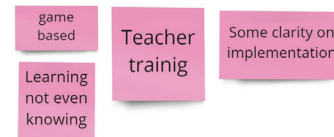
Goal of the project



BOOKS
And
youtube
videos

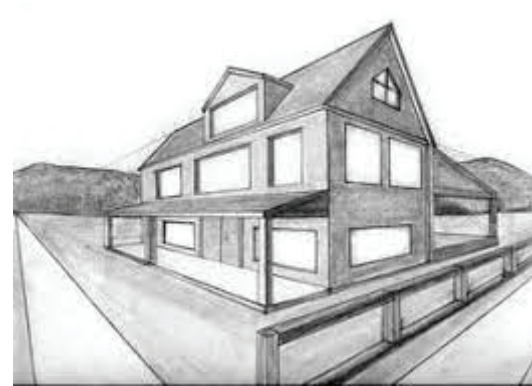
Research
paper

Teacher
trainig



What is Perspective drawing ?

Perspective drawing is a technique that gives the illusion of spatial depth, or perspective, to drawings and paintings. Perspective drawing, like foreshortening, gives the illusion of depth and makes work pop off of the page by using angled lines to suggest vertical lines and horizontal lines.



source : internet

Current Scenario

Present Day Curriculum

Perspective drawing is already covered in class 10th Art for both the CBSE and Maharashtra boards.

After attending a perspective sketching class in a school myself, I realised that the way this topic is handled in schools, would never be able to fulfil the aim that this topic is meant to perform because of the rote learning approach for teaching of a skill/visualisation based subject like this.

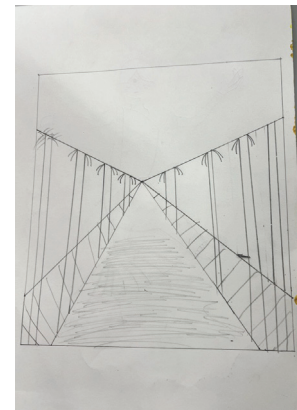
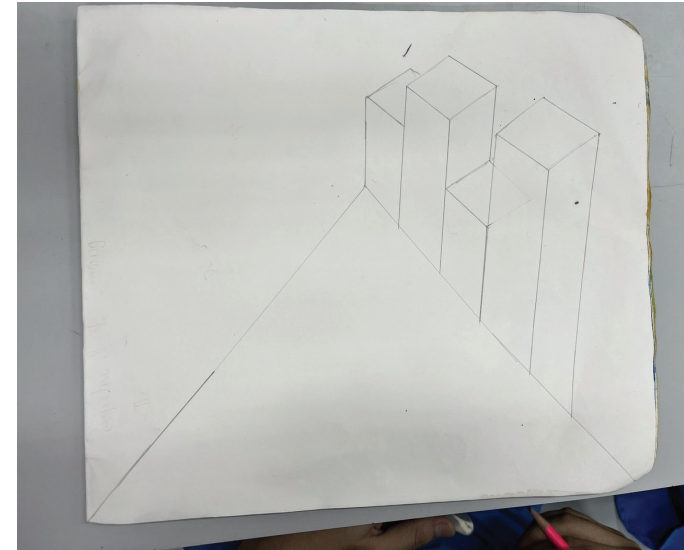
Art in schools?

In a lot of curriculumns, art is an optional subject and only interested students take it up. Due to art being just a side subject it is very rarely seen that art is taught in the detail it is ment to be and supposed to be.



Whereas at some schools, students who take art as a subject receive upgradation in their grades for other subject, this group of youngsters aren't really interested in art, thus they do not bother much to learn a subject like perspective drawing.

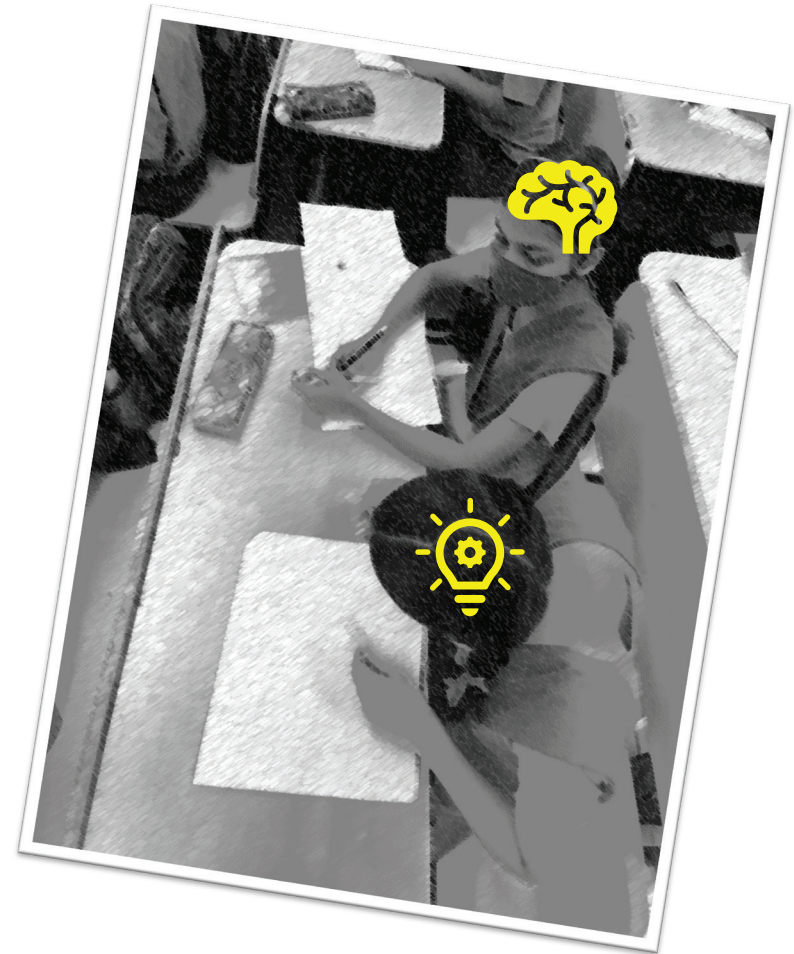
Students at this stage when they are influential and developing numerous interests, it is critical to expose them to environments where they may instil vital skills that will aid them in constructing a solid structure for future challenges but due to above listed reasons it takes a back seat.



Why this topic ?

Perspective drawing is a topic that caters to our spatial visualisation and imagination skills. Not only does such skills help one in art, craft, design, and other creative fields, but it also helps in other subjects such as mathematics, science, and so on. Scientists and learning technology experts have been studying how mental imagery plays a role in learning other complex subjects.

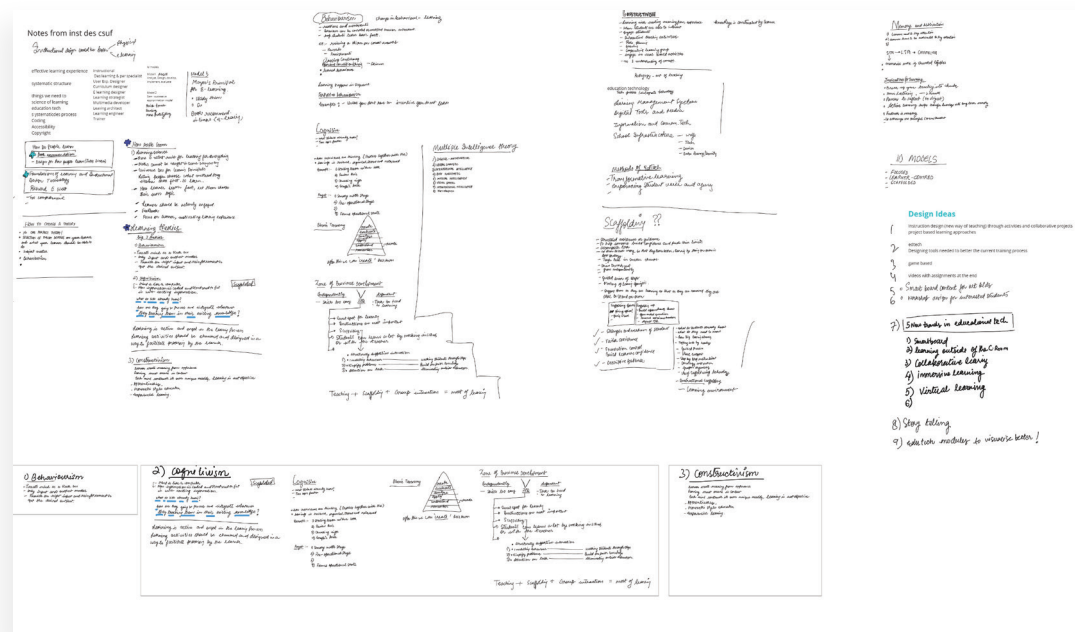
The intention of pursuing this topic is not to force children to believe that only 3D is a correct way to approach a creative drawing rendering, but rather to provide with a mental exercise that may serve as a springboard for them to upskill their spatial learning abilities.



Research

I began by gathering some general information about the important topics in order to lay the groundwork for understanding effective learning methods. Some topics are listed below :

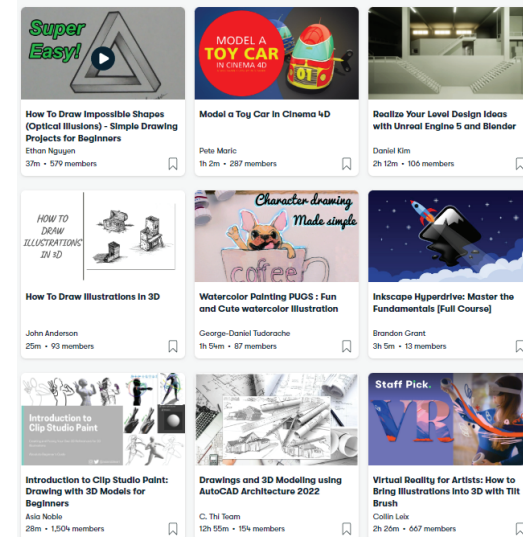
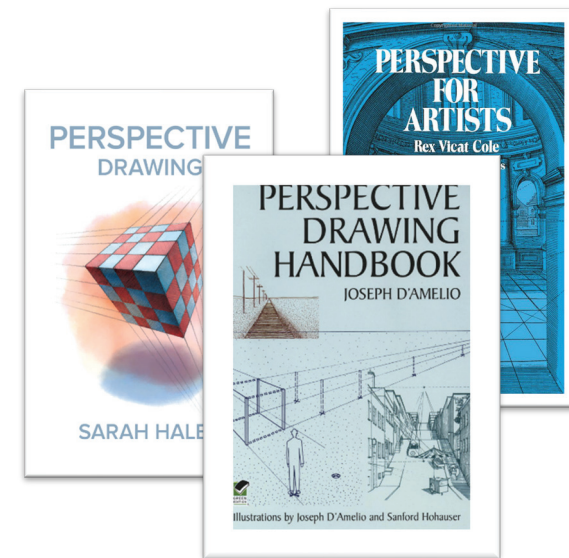
How do people learn ?
learning theories
How to choose a theory?
Edutech benefits and disadvantages?
Mooc
Implication of learning
Immersive/Virtual learning Learning
Trends in edutech
Smart board content
Activity based learning
Game Based Learning
Instructional Design model
Collaborative learning
Micro learning



References for perspective Drawing

Before directly jumping into designing content, a detail study of 3D drawing through perspective drawing was necessary.

Referring from these book helped me create a very strong base for myself as well as gave me understanding of the pedagogy in this subject.

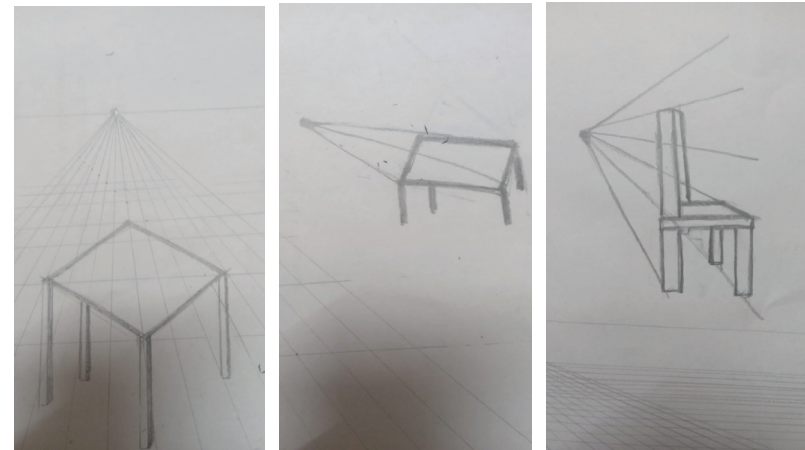
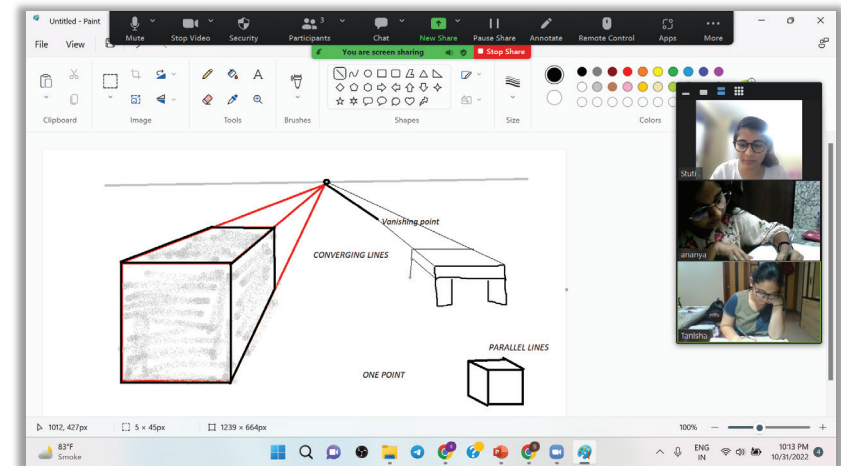


Research

Since class 10th graders already have some basic knowledge of geometry and construction, it was important to understand how much they already knew and what their mental level is to grasp when introducing a concept like 3D drawing to them.

Interacting with students

The interaction was not intended to teach them one point perspective; rather, I asked them questions like, "Can you draw a cube?" Can you create an object with only one side facing you? Can you create a landscape or a cityscape?



Student's Work

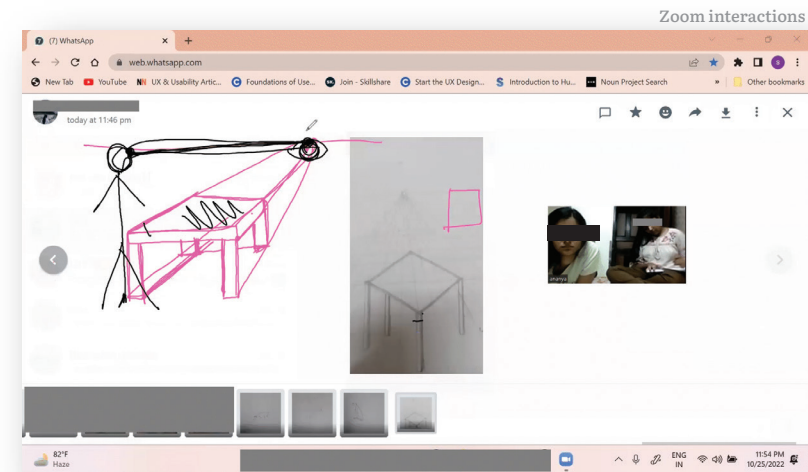
Research

Video Content

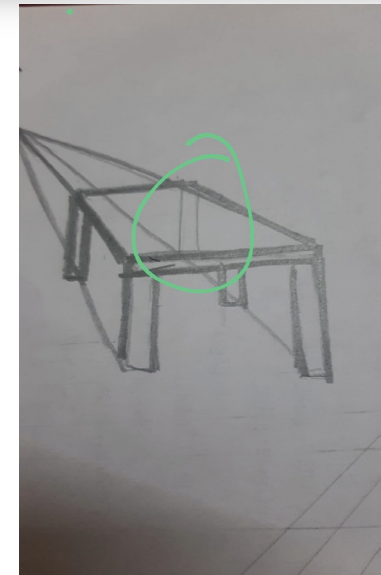
For some batch of kids I shared existing youtube videos on perspective drawing and ask them to draw some things that they learnt from it.

Though after watching videos , many kids copied exactly what was demonstrated in them but were not able to understand why they did what they saw in the content. hence we gradually moved on to clearing thier doubts, in the process of which I understood how daunting it could be to teach.

This interaction was good experience for me to understand a new learners challenge in learning.



Student's Work



Common Insights

Preconceptions

Students refrained from learning 3D drawing because they felt that drawing so much in realism and technical is not their cup of tea, a specially gifted pupil are only capable of that.

Confusions

Students had difficulty understanding difference between vanishing point and viewers eyelevel and the viewer of the artwork.

Overwhelmed !

All the knowlege in onesingle meeting be it in school scenario or in youtube video is too much to grab at a time.

Copying and decoration is all they like!

As long as they just copying the steps in the video they are able to make perfect drawing, only whe ask to do on own they had difficulty following converging lines.

Gathering up topics/ Concepts

To understand perspective main concepts in perspective
One need to have an understanding of 4 topics
which are

Law of diminution, convergance, front view of object
and construction using vanishing point.

Conversion of each of these concepts into per day plan.
i.e. one concept every day.

Each day has one significant activity and a few
accompanying practices to understand things better.

DAY	CONCEPT	MEDIUMS/MATERIALS	TASKs and Exercises
1	Diminution	Activity board	Field visit Activity
2	Converging lines/ why perspective is used	Photographs	Activity Placards Question based teaching
3	Front view of an object	Clay	Sculpting Activity And tracing
4	Construction of object from front view	Paper	Worksheets scaffolding

Prerequisite
Concept understanding

Construction

Design Decisions

Small concepts at a time

Dividing concepts into a 4 day activity, where information is given out in small quantity with maximum focus on refining 1 concept at a day.

Observe and learn

Rather than introducing all of the terminologies and definitions all at once, ask them to observe and reach conclusions (like horizon, Vanishing point, diminution)

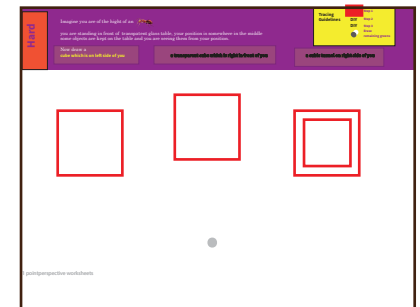
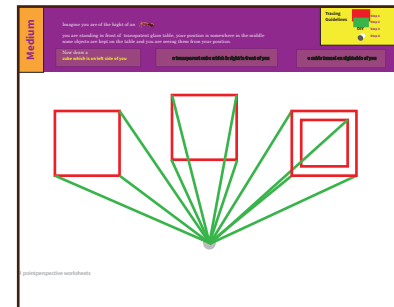
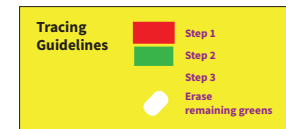
Steps guidelines

To help students understand the correct methods of building objects from a single point of view, they are taught steps by making the construction chronology repeatedly through explainer videos and tracing guidelines.

Otherwise, mindless copying began because they did not understand the construction steps.

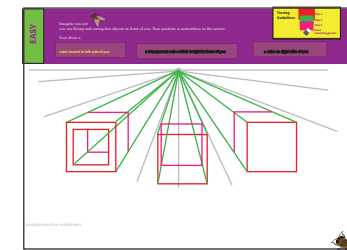
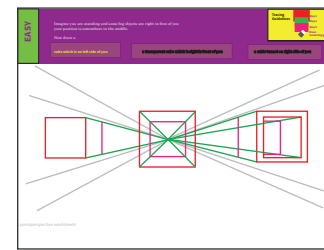
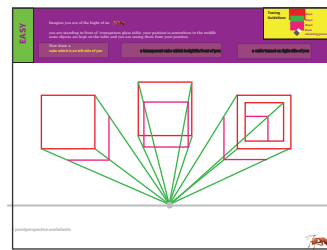
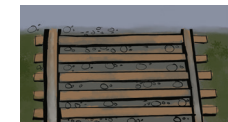
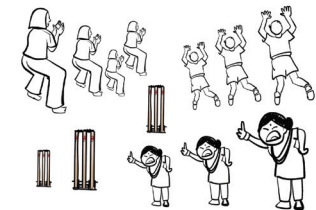
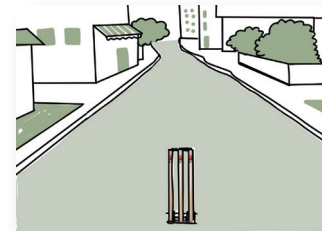
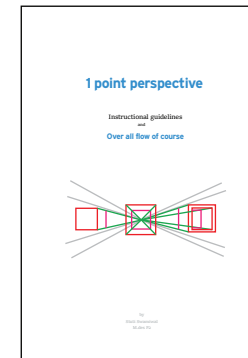
Scaffolding

In initial few attempts children are unable to understand and follow converging lines, therefore the exercises start with students tracing 100 percent drawing and gradually we remove some tracing guidelines so they start making it on their own.



Deliverables

- Instructional guidelines for teachers/Flow of the every day activity
- Activity kits to be given to students at the time of task (if any)
- PPT/Video to explain kids how to do the worksheets
- Gifs for day 2 to be shown by teachers to students
- Worksheet and tracing paper for students



Iterations

The instructional plan took shape after numerous revisions. Initially, they lacked a few crucial components, which I recognized by pilot-testing it with colleagues around me and showcasing it to individuals from diverse disciplines such as art, design, architecture, education technology, IDC faculty meetings etc.

Some of the most important recommendations and points to be included in the project were :

- To make the exercise in a way that students are able to relate with and have some emotional so that the information given is more effective.
- To have students do a comparative examination of how they see the world on a two-dimensional plane before and after the course taken so that they understand what they learned during the workshop.
- Drawing perspective drawings of rounded things in one point perspective may be tricky for learners; thus, some examples might be provided, or students may be shown some rounded items to better comprehend.
- If activities could be designed such that children don't realise what they are doing but instead are having fun and learning via enjoyable experiences.

Overview

INTRODUCTION

1 point perspective

Activity based learning to understand and create 3D depth on 2D plane using 1 point perspective.

For students of 10th standard

Can be carried in correspondence to art subject or as a separate workshop by art teachers in schools.

No. of Students

Class can be divided into group of 3 and each group can be provided with 1 Activity box each

Overview

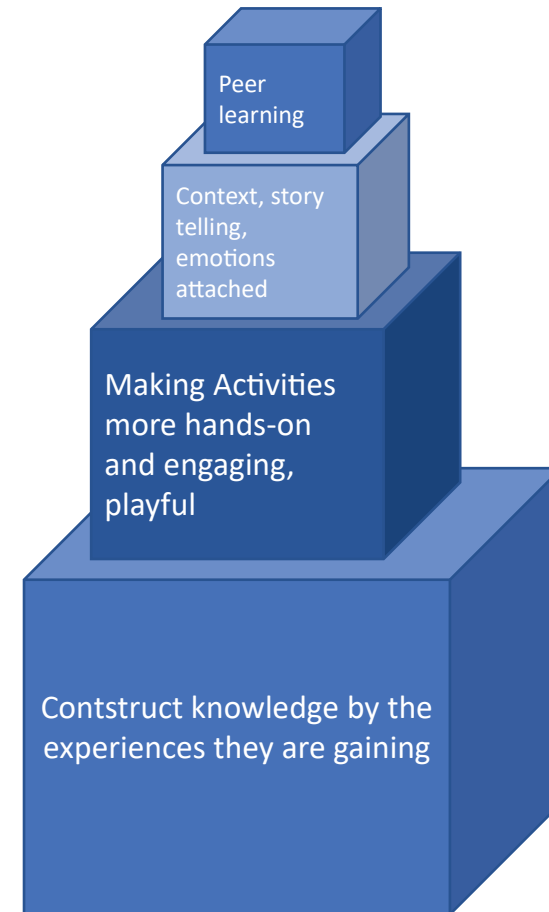
The activities will encourage students to develop spatial visualization by learning about one point perspective. Activities include hands-on exercises inspired from everyday circumstances in their lives, which they will be able to grasp with a high level of relatability. The goal is to stimulate their interest in this area so that they begin observing and learning about it. Students will be able to reflect on why they did what they did after completing the activities and exercises and the instructor may be able to assist them reflect further through question-based learning.

Learning objective

- To create interest in learning 3D forms
- To help students to be able to articulate how is depth created in 2D plane
- To facilitate them in observing surfaces, spaces and areas around them
- To help students observe, construct, question and understand from their hands and interact with materials.
- To help students not just copy/imitate and draw from references but able to develop motor skills through which they can think and apply it on their own
- Provide students with a kickstart of starting from small objects.

Material provided

- Student activity kits
- GIFs and video for instruction for teachers
- Lesson plans/ guidelines



Day 1_{1hr}

Introduction and concept of Diminution

Material :

Activity kit 1
A4/A3 drawing sheets
pencil rubber etc.

1

Introduction

5 min

In the beginning we want kids to maintain certain curiosity for learning this. Hence they are not directly told what they have signed into. Instructors can say something like this to the students :
“Thanks for signing into this workshop.
In next few days with the help of this workshop you will play, observe, draw, mould, and create explore.
Okay i'll give you a hint. This workshop revolves around 3D .
As we will move forward we will know what we are doing, but in the mean time let us start playing.
Gradually we will understand what we will do ! ”

2

Mini task

10 mins

Students can create a quick drawing on any of the various scenarios like :-
My Classroom
My Gardern
My Fav outdoor game etc.

the outputs are stored and preserved for later on. This activity doesn't have any direct connections with Day 1 excercises.

3

Field observation

15 mins

Take students out on a field trip to a nearby park or any open area. Walk around with them and talk about Objects, humans, plants, buildings and other elements etc., looks in size. Help children note that objects which are closer to you look bigger than the same sized objects that are farther from you.

Terminology introduced : Diminution.

4

Activity

20 mins

KIT no.1

Students are provided with a 2D drawing of a gully (the road between the homes), and they are provided with a box of human figures and objects of various sizes.

Instructions for students :

Students are to pick up the particular size of that object they feel is apt, keeping the law of diminishing in mind.

Placing the ball is mandatory; other than that, four more objects should be placed from the given figures. They are given 5-10 mins for this.

Outputs of each student are to be shared with all.

Later on, based on the outcomes, teachers can discuss how they have created the illusion of depth in a 2D plane and can help correct the placement of images if needed.



One possible solution for solving the activity

Learning Objective :

- Inculcate understanding of sapcial depth through diminishing forms
- Give hands on experience in creating one scene / without them to having drawing them on their own
- To make learning fun by giving them situation relatable
- To not just understand depth on 2D but additional value add to them by helping them communicate a story by creating scenes in thier own unique way

Day 2^{1hr}

Convergence, foreshotning, vanishing point, converging lines

Material :

Activity kit 2

GIFs

White board marker, Scale, duster
pencil rubber etc.

1

Introduction to terminology

Start by asking What converging lines are?

Then explain concept of converging lines if students are not clear.

3 min

2

Mini task

KIT no.2

The task for the student is to find a minimum 2, Maximum of six converging lines and the point at which it is converging in the images that they have chosen.

The teacher may explain through 1 demonstration given on the left.

The instructor can explain to kids that these lines do not exist in reality but

are imaginary, which helps when we create 3D depth on 2D. Students are to be asked to pick any of the four pictures of their liking. Out of them, 1 picture marked in orange is mandatory to pick (i.e. magnified image of an object).

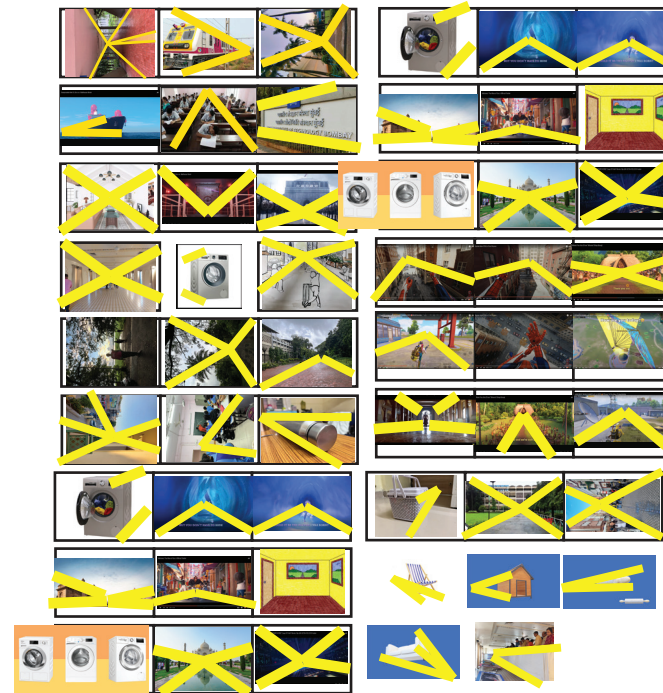


Outcomes of each and every child are to be shared among all.

There could be a round 2 where all images are exchanged amongst them and they may try marking converging lines on them.

Terminology introduced : Converging lines, Vanishing point.

Answer Sheets (teacher's references)



They could be more converging lines in an image. Answer could be subjective

4

Reflection Time

10 mins

Questions to be asked

What did you learn from this exercise?

Observations ?

Why are we drawing lines?

How is diminution applied here?

What would happen if converging lines were not there?

To view their drawing that they made ? Can you find converging lines in your drawings?

5

Gif Screening

10 mins

To make kids understand what will happen, if the visual illusion of convergence is removed from images, instructor will screen few gifs given in this link :

<http://.....>



Learning Objective :

To familiarise the students with observing converging surfaces and lines in the landscape. By doing activities, they are made to realise how things seem to be getting converged at one point. Through this, more detail can be depicted in 3D in 2D paper through converging lines

Day 3 .45 mins

Learn to find out planes

Material :

Clay
Paper
scale
cutter
pencil rubber etc.

Clay models

30 min

Students are provided with clay. They are to be assisted in handling the clay by the instructors and help them make a cube.

Next, they have to make students model any simple object that could be found around, like :

A car, A chair, a table, Building, a bottle etc.

Students are made to observe the object right in front of their eye level in a rectilinear path.

They are made to draw what they see on paper.

Possibilities are that some of them may be able to make correct planes.

For those who are not able to follow the dissection technique as shown in the image,



Students are to practice any 3 objects and draw planes. from different sides.

Terminology introduced : planes

2

Imagination

Foster students to now make clay model of an object and observe it properly.

Then the clay model may be taken away and students are made to visualise and create a plane on their own

Learning Objective :

This exercise aims for kids to understand the front view, planes of an object, And aid them in drawing them on paper.

Making models will help them remember surfaces through motor sensations help their minds build mental imagery.

Alternate Exercise

Using a credit card as a plane.

All the faces of the object parallel to the object can be considered as the first step of starting with the construction of one point perspective.

Day4

1hr 10 min

Drawing objects in one point perspective

Material :

Worksheets
tracing paper
Paper
scale
pencil rubber etc.

1

Bringing all activities together.

Reversion of all the activities of Day 1, Day 2, Day 3.

10 min

2

Intro to drawing objects in one point perspective.

<https://www.youtube.com/watch?v=FYj2ANHlPk8>

till 2:48



5 min

3

How to do worksheets

Show the ppt/video

5 min

4

How to conduct worksheet exercise

- Each student is asked what they would like to be an aunt? A human ? Or A butterfly ?
- students cant play role of same creature. According to their choices, they are given the worksheet of **easy** level.



20 min

3. 3 cubes are given on every sheet.

explain kids to trace the lines in the correct order as they saw in the video.

order :

1st- **red line** -front plane of cube

2nd- **green lines** converging lines from the vertex to the vanishing points

3rd **pink line** which is the lines parallel to the front plane, closes the object from back

4th. **erase** green traced lines which are extending from pink traced lines to vanishing point.

Advice finish one cube entirely and then move on the second one.

showcase work of each student to each other

5

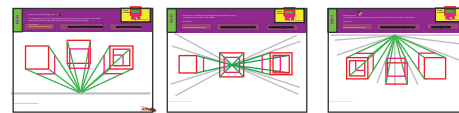
Reflection time

10 min

Why are the vanishing points on different levels in all of your sheets?

Does this have any difference from what role you are playing?

How are all your drawings different from each other?



6

Continuation of medium level and hard level worksheets.

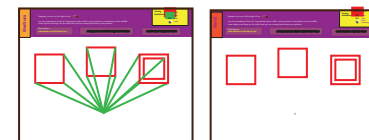
20 min

Students are asked to similarly complete medium level and hard level worksheets in which green and pink lines are missing which they were able to trace in the first worksheets.

After they are finished all sheets they are displayed in the class so that all can see each others work.

Students can suggest and point out mistakes.

Then the teacher can help them out in making correction

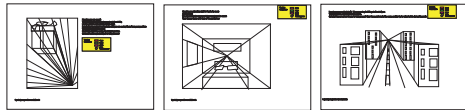


7

H.W

10 min

To understand and implement the steps and the principle they learnt to make other scenarios and scapes they are given practice sheets with premade traceable scenes which student can trace and figure out how it can be implemented.



Learning Objective :

learning by doing

Children can build confidence in themselves as they are given 100% guides to trace.

Students will understand three mediums simultaneously- glass, opaque, hollow

Through scaffolding, in the end, students will be able to learn gradually correct methods and chronology of drawing objects rather than just copying what they see around.

Test

Now lets imlement what you have learnt so far in the first letter of the word
Imagine you are standing BELOW the letter. Now make a view in 1 point perspective.

One example of letter Z is given for yor reference !

Bonus point for writing full name in 3D.

Hints !!!!!

Step 1 make front view

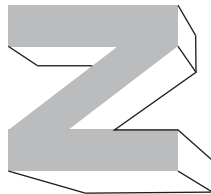
Step 2 Decide vanising points according to the viwer

Step 3 Join edges of the front view of object to the vanishing point

Step 4 Make parallel lines according to the front view

Step 5 Erase extra lines

1 pointperspective question paper



Further Steps

The testing of the instructional plan is yet to be done.
Hence further steps remaining are to :

- Testing with target group
- Recording the observations
- Iterate the activity/ plan accordingly
- Feedbacks from students of their experience of learning through the plan
- Final observations and conclusions are yet to be made.

Future scope

- The layouting of guidelines and packaging of the activities can be improved.
- An alternative task can be given to tackling the repetition over the years
- The digitalisation of the activities can be done to increase accessibility
- Feedback form for teachers to observe problems over the years with the course
- More exercises for rounded objects can be tackled
- At the moment, any fixed criterion of the evaluation is not given, but gradually that can be introduced by making activities objective in nature.

References

<https://www.indiamags.com/magic-pot-magazine>
<https://www.educationworld.in/the-importance-of-art-education-in-schools/#:~:text=Studying%20the%20arts%20also%20helps,fosters%20collaboration%20and%20group%20learning.>
<https://www.quora.com/Why-cant-the-indian-education-system-improve>
https://youtu.be/CRJlX27_E8
<https://miro.com/app/board/uXjVOJqFDhc=?moveToWidget=3458764534111137889&cot=14>
<https://info-design-lab.github.io/ID668-2018-Instructional-Design/>
https://www.youtube.com/results?search_query=perspective+drawing
<https://www.skillshare.com/en/search?query=Perspective+Drawing&searchMethod=autocomplete>
<https://ieeexplore.ieee.org/document/8590098>
<https://link.springer.com/article/10.1007/BF00143925>
https://books.google.co.in/books?hl=en&lr=&id=K7bLDAAQBAJ&oi=fnd&pg=PA1&dq=perspective+drawing&ots=npp8u3h5RQ&sig=nZvaC3epzNp-UuQAPR8lbtFzYBQ&redir_esc=y#v=onepage&q=perspective%20drawing&f=false
https://www.youtube.com/results?search_query=learning+theories
https://www.youtube.com/results?search_query=national+education+policy
<https://ncert.nic.in/learning-outcome.php>
https://cbseacademic.nic.in/web_material/CurriculumMain23/Sec/Painting_Sec_2022-23.pdf