Colour Matrix

Begin the activity by displaying a world map that shows surface temperatures of different countries during a specific month, using a colour scheme. Ask the students why colours might be used on the map and how they help in understanding the temperature patterns.

To conduct this activity *(recommended for a group of at least 20 participants)* in a classroom, facilitator can follow the following steps:

Step 1: Distribute the grid sheet

- Give each participant a 5 x 5 grid (square shaped) containing 25 boxes.
- Each box contains a number assigned to a particular topic. The key for the numbering is provided in Annexure 1 and Annexure 2)
- Facilitator may announce or project the Annexure topics to the students.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

Step 2: Ask students to colour each box based on the following rules

Green: If they like the topic

Red: If they dislike the topic

Yellow: If they don't know the topic OR have no opinion about it

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
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Step 3: Display and encourage discussion

Collect all the coloured grids and display them on the classroom blackboard or whiteboard/ wall.

Ask students to discuss amongst themselves and deduce patterns visible from the colours. Facilitator may ask questions like:

- Which colour appears the most or least?
- What does more “red colour” across all the grids indicate?
- For this particular row, what inference can you make by looking at the colours?

Pair up the students and ask them to present the data in different formats, such as by calculating percentages, creating pie charts, bar graphs, or using any other method they prefer.

Tips for the facilitator

- For the sake of consistency, facilitator can make standard 5x5 grids and give to all students. If students make their own grids, there is a possibility of variation in the dimensions of the grid.
- The topics for the grid colouring exercise can be anything that the facilitators deems fit. Two examples are provided in Annexure 1 and Annexure 2.
- Teachers can also use other criteria instead of 'like,' 'dislike,' or 'no opinion'—such as 'sometimes,' 'often,' or 'always'—to ask students how confident they feel about a certain action/topic.

Colour Matrix

Annexure 1

Lines and Angles	Triangles and its properties	Quadrilaterals	Constructions	Circle
Integers	Rational numbers	LCM and HCF	Squares & Square-root	Exponents and Powers
Perimeter and Area	Volume	Algebra	Linear Equation	3D-shapes
Tally Marks, Pictograph	Bar Graph / Pie Chart	Mean, Median, Mode	Graph Plotting	Probability
Fractions and Decimals	Percentage	Ratios and Proportion	Simple Interest	Profit and Loss

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Annexure 2

Diversity in Organisms	Nutrition and Diet	Plants Nutrition	Animal Nutrition	Micro-organisms
Natural Resources	Pollution	Forest and Wildlife	Food Safety	Health and Diseases
Force and Pressure	Sound	Light	Current	Magnet
Acids and Bases	Physical Changes	Methods of Separation	Metals and Non-Metals	Matter
Natural Phenomenon	Solar System	Stars and Constellations	Atmosphere	Satellites

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Background

In the rapidly evolving world of the 21st century, data science is becoming very important in every sector. It is a vast field with several components like data collection, data management, data modelling including data visualisation. Data visualisation refers to the practice of representing information in a pictorial or graphical form, enabling people to quickly grasp patterns, trends, and insights from complex datasets.

Researchers argue that our visual discrimination is far better than our linguistic system at dealing with complex ratios and continuous variations in space, line, shape, and colour (Lemke, 1995). Among various visualisation tools like charts, graphs, and diagrams, colour map is a way to show data or numbers (typically discreet quantities) using colours (Rogowitz, 1998). Children are often more attuned to visual stimuli than to abstract data sets or textual representations. By assigning colours to responses, students can immediately see relationships and distinctions between different pieces of information. This method taps into their visual learning styles and aids in memory retention (Mayer et al., 1996). Using this method helps to make large data more easily interpretable.

The Colour Matrix activity is designed to help learners understand that colours can be powerful tools for communication. By colour-coding information, students are able to highlight similarities, differences, and patterns within the real data that emerges from their own classroom. As they create their colour matrices collectively, they develop essential skills in data organisation and pattern recognition through observation and discussion. Students can also learn to interpret quantitative information visually. This activity aims to create a dynamic environment where students can explore both personal and collective interpretations of the data.

References

Lemke, J. (1998). Multiplying meaning: visual and verbal semiotics in scientific text. In J.R. Martin & R. Veel (Eds.), *Reading Science: Critical and Functional Perspectives on Discourses of Science.* (pp. 87-113). London: Routledge.

Mayer, R.E., Bove, W., Bryman, A., Mars, R, & Tapangco, L. (1996). Why less is more: meaningful learning from visual and verbal summaries of science textbook lessons. *Journal of Educational Psychology, 88* (1), 64-73.

Rogowitz, B.E.; Treinish, L.A. (1998) Data visualization: the end of the rainbow, Spectrum, *IEEE , vol.35, no.12,* pp.52-59

Example of Heatmap/Colour map: https://en.wikipedia.org/wiki/Heat_map