



# Coding a Binary Picture

By European Parents' Association - EPA



## Objective

To understand how digital images are represented using binary code (0s and 1s) and the concept of pixels.



## Duration

100 – 120 min

## Target group

Children 7+ yrs



## Experience

beginners

## Materials

- Tap Grid paper (or draw grids on plain paper)
- Two different colored markers, crayons, or pencils (e.g., black and white, or two distinct colors)
- Simple, pre-drawn grid pictures (e.g., a small heart, a simple letter, a basic shape) as examples
- Blank grid sheets for participants to use



## Description

- **Introduction: Understanding Binary Pictures:** Prepare grid paper, coloring tools, example grid pictures, and blank grids. Introduce the concept that pictures on screens are made of tiny dots called pixels. Explain that computers use binary code (just 0s and 1s) to store information about these pixels. Assign one color to represent '0' (e.g., white/blank) and the other color to represent '1' (e.g., black/filled in). Show an example of a simple grid picture and its binary code, explaining how the sequence of 0s and 1s represents the colors of the pixels. Walk through translating a simple image into its binary representation and vice versa.
- **Activity 1: Encoding a Picture:** Give your child/ren a simple grid picture. Have them create the binary code for that picture on a separate piece of paper by writing down the sequence of 0s and 1s based on the colors or filled/unfilled squares in each row or column of the picture.

- **Activity 2: Decoding a Picture:** Have your children swap their binary codes or give your child the code of a picture written by you. Using a blank grid and their two colors, have them "decode" the binary code they received by filling in the squares according to the sequence of 0s and 1s to recreate the picture.



## Extension

- **Larger Grids:** Use slightly larger grids for more complex simple images.
- **Predict the Code:** Show a simple grid picture and ask participants to predict what the first row or column of binary code would be.
- **Simple Animations:** Create a sequence of very simple binary grid pictures that show a slight change between each one, like a ball moving one square over, and discuss how animations are just a series of images displayed quickly.

### Legal Disclaimer

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