UBC Geering Up
Engineering Outreach

Pixel Art

Subject: Science/ ADST	**Grade:** 1-3	**Duration:** ~ 1 hour (Can easily be adapted!)
Lesson Overview	Zoom into the computer screen and explore the tiny building blocks of digital images—pixels! Students will learn what pixels are and how they form digital art by creating their own pixel images. This activity integrates art and computer science and can be done either plugged (digital) or unplugged (paper-based)..	

Curriculum Ties (in addition to satisfying multiple core competencies):

ADST (Applied Design, Skills & Technologies):

- Skills can be developed through play.

Arts Education:

- K/1: Engagement in the arts creates opportunities for inquiry through purposeful play.
- Gr. 3: Creative experiences involve an interplay between exploration, inquiry, and purposeful choice

Content Objectives

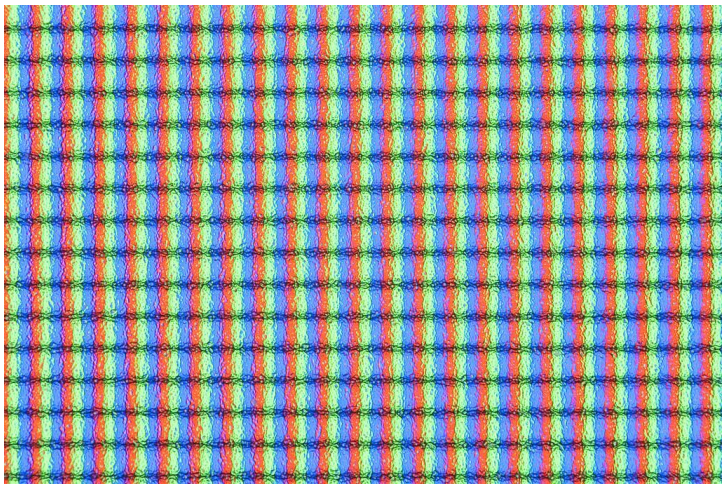
By the end of this lesson, students will be able to:

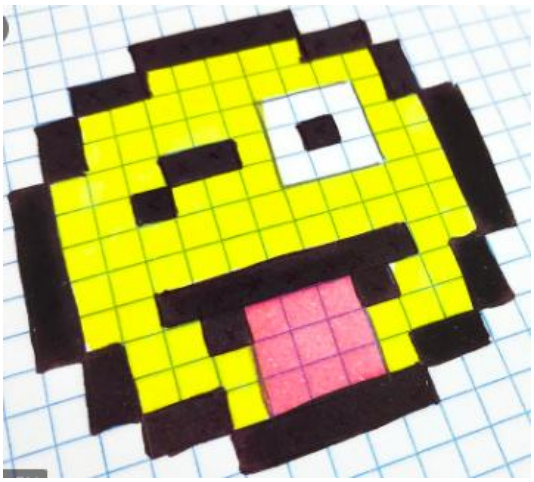
- Define a pixel as the smallest unit of a digital image.
- Understand that on screens, pixels are tiny coloured squares.
- Recognize that each pixel is one colour made from RGB (red, green, blue) or CMYK combinations.
- Create their own emoji or image using pixel art techniques..

Materials & Equipment Needed

Consumables:	Non-Consumables:
Unplugged version: • Grid Paper • Colouring Utensils (pencil crayons, crayons, markers)	**Plugged Version:** • Just Laptops! • https://make8bitart.com/

Lesson & Activity

Lesson Stages	**Learning Activities**
Introduction	Prompt: What do magnifying glasses or microscopes do? • They help us see tiny things more clearly! Explore: What if we looked at a computer screen under a microscope? • Students share observations (e.g., colourful squares) • Introduce the concept of pixels  • Define a pixel and explain RGB/CMYK briefly

	• Relate it to art – today we'll make our own pixel art! Optional: Let students use real magnifying glasses or microscopes on screens to find pixels.
Activity	**Unplugged Version:** • Hand out square graph paper. • Students choose a favourite emoji or simple image. • They recreate it using the grid, treating each square as one pixel (one square = one colour). • Encourage careful planning and use of colour blocks:  **Plugged Version:** 1. Go to: https://make8bitart.com/ 2. Demo the program or let them explore! It's a cool program & students pick it up really quickly!

- Pick a colour on the right hand side.
- Click on the square you would like to colour.

3. Ask them to recreate their favourite emoji in the program!

To download the art:

Click import/save!

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Click “full page” underneath “to png:”.

Examples:

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Recap: What is a pixel? How are images made of them?
Ask: What was different between the paper and digital version?
Which method did you prefer, and why?

Optional Wrap-Up:

Form a gallery walk with the final pieces.

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	• Have a mini "emoji museum" where students share and explain their work.
Step Ups & Step Downs	• Have students do both versions: draw first, then digitize it. • Challenge older students to write short messages in pixel text. • Create a class mosaic by combining small student artworks into one large image. • Explore pixel resolution (more squares = more detail).

Background Knowledge

What is a Pixel?

A pixel (short for picture element) is the smallest unit of a digital image or graphic that can be displayed and represented on a digital display device. On most screens (like computer monitors or phone displays), each image you see is made up of millions of tiny coloured squares, these are the pixels.

Each pixel displays a single colour that is determined by a combination of three basic colours of light: Red, Green, Blue

This is called the RGB colour model, and by adjusting the intensity of each component, millions of colours can be represented on screen.

In printed images, a different model is often used: CMYK (Cyan, Magenta, Yellow, Black), which mixes pigments rather than light.

The resolution of a screen or image (e.g., 1920 x 1080) tells you how many pixels there are in width and height. More pixels = more detail = higher resolution.

Additional Resources

- https://www.pixilart.com/
- https://www.piskelapp.com/