

Computer Science Lesson Plan

Programming Images

Summary

1. Subject(s): Computer Science
2. Topic or Unit of Study: Programming/ Coding
3. Grade/Level: Varies
4. Objective: Students will learn how computers store images and experience programming an image just like a computer does.
5. Time Allotment: 2 class periods

Standards

13.1.3 and 13.1.8 Career Awareness and Preparation

15.4.8 Computer Software & Programming

Implementation

For older students use the [CSUnplugged Colour by Numbers Lesson](#).

For younger students use [Code.org Graph Paper Programming Lesson](#).

Learning Context

You will need to introduce pixels and screen resolution before this lesson. Also a discussion about how fax machines worked or demonstration of a fax machine since many students do not know what they are. Also this could be tied into an art lesson about pixelated art.

Procedure

- a. Anticipatory Set

Have students explain what pixels are as well as how the number of pixels in an image provide more detail and definition.

b. Direct Instruction

No matter which lesson you follow either from CSUnplugged or Code.org, you should give students graph paper and all practice one or two drawings. With CSUnplugged the images will be coded using numbers and with Code.org the images will be coded using arrows.

Here is a link to a [slideshow](#) to work with demonstrating the CSUnplugged lesson.

c. Guided Practice

Both lessons provide examples for students to practice with. Also for the Code.org lesson I suggest having students use the [LightBot Hour of Code](#), this is a fun extension.

d. Check for Understanding


Both lessons provide an opportunity for students to create their own drawing, then code it themselves. Then students should copy the code on a sheet of paper and give to a friend to try to complete the drawing from their code. Idea: Assign the drawing and writing of the code as homework and the next day have students trade or have someone at home complete their drawing.

e. Closing

Host a discussion or blog post writing about their experience of coding their own drawing. Did their code give the results they were looking for? What was easy about graph paper programming? What was difficult about it?

Extension Activity: Have the students compete in teams in a graph paper programming relay race. Have codes created for pixel drawings, each team can send on student at a time to complete a part of the code. Students will have 'debug' their teammates work in order to make sure their drawing is correct!

QR Codes to access lesson materials

<p>CSUnplugged Lesson</p> 	<p>Code.org Lesson</p> 	<p>Pixels Introduction Slideshow</p> 	<p>Lightbot Hour of Code</p> 
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