School Rocks!
Project-Based Learning

"And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and God saw that it was good." Genesis 1:21 (KJ)

Student Objectives:

The student will be able to

- create a super-procedure and sub-procedures in Logo language
- sequence the steps in a programming project to obtain a desired result
- use graphic software to create bitmap images to use in the program
- create an animated image using Logo programming language that moves across the screen

Performance Objective

You will create a program using the Logo programming language that uses sub-procedures, super-procedures and correct syntax to depict an image of a school with an animated bus driving up to the school.

Introduction

As you have seen in our study of programming, animating images is nothing more than creating a digital flipbook that tricks the eyes into seeing movement.

Logo is a great language to learn about coding, using correct syntax when coding, and running and debugging programs when they do not execute as expected.

Remember, if at any time you become stuck, ask a peer, look in the index, or ask your instructor for help in debugging a module.

Constructing Your Program

It is time to apply your computer programming skills to creating a super-procedure in the Logo language called "School." School will use your programming knowledge of Logo, your correct use of command syntax, and your creative and artistic side in coding a program that draws your concept of a school and an animated bus that drives up to the front of the school's doors and parks.

School is a colorful place, so use colors, geometry, and contrast to capture the viewer's attention.

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Here is a checklist to use while constructing your program:

Procedures

Super-procedure "School" that first clears the screen and
resets the turtle to the home position as well as resets the
pen size to 1 and the pen color to black. It also includes the
following sub-procedures and the directions to move the turtle
to the position necessary to begin the next sub-procedure

    building   flag
    playground   parking_lot
    bus

sub-procedures do the following:

- building
  - draws a two story building with windows and a front door
  - roof of school can be any shape you desire
- flag
  - draws flag (red/white/blue) by the school

- playground
  - use your imagination but must include two of the following: include see-saw, sandbox, swing, or a tetherball

- parking_lot
  - draw lines for parking space and use color

- animated bus
  - your bus will drive across the screen showing movement (wheels turning, smoke coming out of tail pipe) and park in front of school

color in your program
- border colors on your shapes
- enclosed areas should have colors
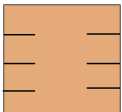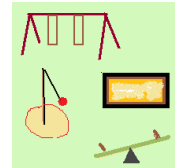
Evaluation

In order to get the most possible points, follow the checklist above
exactly as shown. Remember GIGO: Garbage In, Garbage Out! Try to
use correct syntax and minimal coding for a clean program.

The "points earned" breakdown is as follows:

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Category	Parameters	Points Earned	Points Possible
Main Procedure "School"	• clears the screen before running Calls on sub-procedures • uses primitives to place the turtle correctly on the screen in desired positions before running a sub-procedure • hides the turtle while executing		20
Sub-Procedure Building	• two story • windows • door • roof		20
Sub-Procedure Flag	• Uses 3 colors • has pole • has border • closely resembles "American" flag		10
Sub-Procedure Playground	• includes two of the following: include see-saw, sandbox, swing, or a tetherball • placement on screen • proportional in size		10
Sub-Procedure Parking Lot	• color • lines (slant) • evenly spaced		10
Animation	• correctly uses images • image replacement not choppy • correct use of timing on image switching • image shows movement to "naked" eye		20
Color Use	• uses filled-in color regions • uses border colors • uses background colors • contrast		10
Extra Credit	• a second animation effect using a second clipart creation will give you an extra 5 points • if your school has 3 dimensions (length, width, and height), you get an extra 5 points		10