Logo Writer Unit

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Objective: Provide a creative programing language for students. Allow students the freedom to use this language to create and build understanding of how computers operate and how to use them.

Procedure: Create excitement among the students for each lesson. Give the students enough new information to stimulate new pages but do not overload with lots of commands. Use a constructionist approach to student work.

Evaluation: Evaluation will center around students mastery of the basic commands. At the conclusion of instruction the students are given a set screen or project to create. Great incentive is provided for students to master the lesson objective. Only after the objective has been reached will the student be allowed to work on an independent project. Challenges are offered for able students before they proceed on independent work.

Lesson 1: Introduction. Use projection of screen. Show how turtle moves. Introduce FD, BK, RT, LT. Explain angles, degrees and why angles over 360 degrees are pointless.

Project: Students to draw one rectangle and one square.

Challenge: Draw a triangle and pentagram.

After completion of assignment students are free to pursue and experiment with commands.

Lesson 2: Introduce color commands and pen commands. Show students where help screen is and the colors that are available. Show how Pen Up [PU], Pen Down [PD], and Pen Erase [PE] work on overhead. Show how to access the help screen using apple keys. Explain Set Color [SETC], Set Background [SETBG], Clear Graphics [CG]

[SETBG], Clear Graphics [CG].

Project: Change background color, turtle color, draw two squares that are not connected. Draw a dotted line.

Challenge: Draw a dotted line with different colors. Draw a square inside a square each using a different color. Ask class about the color black. How is it created? Upon mastery of concepts students are free to experiment.

Lesson3: Introduce REPEAT. Show on overhead how to create square: REPEAT 4 [FD 45 RT 90]. Show on overhead that REPEAT 100 [FD 45 RT 90] does exactly the same as the first repeat. (ie A waste of the Turtles time!) Do a short lesson on the chalk board explaining angles: 360 degrees to circle, 90 degrees to right angle. Indicate that angles (RT and LT over 360 are a waste of the turtles time!)

Project: Create a square inside a square with no connecting lines using repeat function.

Challenge: Create multiple squares inside squares, each of a different color and each without connecting lines, using REPEAT.

NOTE: These lessons can be broken up for class periods of exploration at any time. Every effort should be make to have students be comfortable and master the new commands. Additional challenges can be offered for students able to grasp initial concepts while other students work on standard project.

Lesson 4: Introduce Name Page, and Save Page. Explain how work on the page can be saved but only if the page is named. Show using screen how to save a page and then how to change the page name. .

Project: Students create one page named LW their name. Then change page name to LW their name in caps. Then change page name again to LW their name in lower case. Students use initials to create page name to save work on. Class then creates own work using commands and saves.

Challenge: Is there a maximum length for a page name?

Lesson 5: Introduce LOGO Writer word processing. Commands- Cursor to top of page, Cursor to bottom of page. Clear Text [CT]. Use overhead to show class that the cursor will change position using Apple U and Apple D to graphic screen or command center. Show how pages can be named and titled

on the graphics page.

Project: Students use named page from table of contents to CG and then create a design on the page. The students will then title the page and put their names on it. The class will then save, bring up screen again and view other students work. Emphasis is on original work using REPEAT and other commands using various colors and designs. Emphasis will be placed on avoidance of large repeats with no turns which color the entire screen.

Students to finish project on named page, title page and students names must be on screen. Students must save for next lesson.

Challenge: Students will name additional page and experiment further.

Lesson 6: Printing the graphic page. Student's use printer.setup to change to color printer setting for Image Writer. When students work is ready then print using PRINTSCREEN.

Project: Complete a graphic project. Title the picture and put students names on page.

Print out final copy. Compare different graphic works to see which print out best. Discuss why certain pages look better.

Challenge: Write a short description or story and illustrate, then print.

Lesson 7: Introduction of Shapes and STAMP. Use the projector screen. Show Shapes page from table of contents. Have students memorize three shapes by number. Introduce SETSH, Explain that shapes do not show direction the way that the turtle does.

Project: Students to stamp 3 shapes on page two times each.

Challenge: Stamp using different colors for each shape. Additional challenge: Make a road with trees, houses and cars.

Lesson 8: Introduce: FILL. Show similarity to paint can in painting programs. Indicate that the fill command can ONLY be used after a PU and PD command sequence. Use overhead projector to show how fill can be used.

Project: Create 3 designs and fill in each with a different color.

Challenge: Make a flag of your own design.

Lesson 9: Introduce SHADE. Show similarity of FILL and SHADE as far as preliminary steps. Show how shape and color are critical to effect. Demonstrate on overhead method and effect of SHADE on entire screen, and within closed shape.

Project: Students to divide screen into four sections. Then SHADE using different shapes and colors.

Challenge: Create various shapes and fill with different colored shapes.

Lesson 10: Creating a Shape. Class shown how to use Apple F command from SHAPES page to create own shape. Students work on creation of shape.

Project: Students to create a picture of their own choosing using commands: STAMP, FILL, SHADE. Note: Since a majority of class time will be spent on making the shape students will have assignment to bring in idea for picture they will create during next class.

Challenge: Students take graph paper and work up a shape design in advance of next class.

Lesson 11: Combining Skills. Class to create a picture on their own choosing using commands learned so far. When picture is completed students will access printer and print out design.

Project: Create and print a computer generated picture.

Challenge: Add shapes of own design to make picture more effective.

Lesson 12: Students to experiment and construct a screen design using any commands known. Students may create SHAPES, use REPEAT and work with all tools to create a screen.

Project: Create a screen using any commands known.

Challenge: Have student use every command available.

Lesson 13: Review of previous 4th grade work. NP, CG, CT, SETC, SETBG, LT, RT, FD, BK, REPEAT, PU, PD, PE, SETSH, STAMP, SHADE, FILL, PRINTSCREEN will all be reviewed.

Project: Use all commands in the creation of a page. Print page.

Challenge: Create triangle, square, pentagon, hexagon on page and fill with different colors, then print.

Lesson 14: Introduce the "FLIP SIDE". Show how through using TO **** and END the students can tell the computer to do multiple commands. Use CG at beginning of all FLIP SIDE programs. Explain that all programs must use END and end of program.

Project: Write a program "box" which will make a square on the graphics page. Write another program "box2" which will make one box inside of another. Write names on page and print. (use non color printer to speed up process). These printed exercises will form the basis of a bulletin board showing student work.

Challenge: Make the program "box2" have different colors inside each of the boxes.

Lesson 15: The Geometry of shapes. Ask students for possible solutions to programs to write shapes as pentagon, triangle, decagon. Write student solutions on chalk board (correct or incorrect). Ask about possible solutions to circle. Introduce HT, Hide Turtle to have cursor draw without turtle shape attached.

Project: Students to create programs to draw shapes on screen. Each program name should describe the shape drawn. Printscreen.

Challenge: Draw a circle inside a square. Make it touch the four sides of the square. Printscreen after writing names on graphic screen.

Lesson 16: Creating a Super-Procedure from Sub-Procedures. Show on overhead a sample program which uses a number of procedures and links them together in a super-procedure. Explain why smaller procedures are valuable, to be repeated at various times in the program and easier to debug that large procedures. Explain format of writing FLIP SIDE procedures: Extensive use of return key, make program easy to follow. Show and explain how "comments" may be used in programs. All programs are now required to have a comment at the beginning: name, date, short description.

Project: Write a program which will link some earlier PROCEDURES used on the flip side. Run Super-Procedure to see if all procedures are begin run. Debug if necessary. Challenge: Modify Super-Procedure so that all shapes in

Debug if necessary. Challenge: Modify Super Procedure so that all shapes in Sub-Procedures are in different areas of the screen and do not overlap.

Lesson 17: Introducing commands: Set Heading [SETH], Show Heading [SHOW HEADING]. Explain compass headings vs. LT and RT headings. Explain RELATIVE headings and ABSOLUTE headings. Using overhead show SETH commands. Absolute heading can also be described by Compass Rose headings N, S, E, W, and so on. Handout heading direction so students can make decisions on Turtle direction. Explain SHOW HEADING, which details the turtles position at any time.

Project: Have students make a compass rose on their graphics screen. Use SETH command.

Challenge: Students use Apple U and Apple D to type numbers on screen for compass rose angles. Printscreen.

Lesson 18: Introducing commands: Go Home [HOME], Set Position [SETPOS], Show Position [SHOW POS]. Handout showing the grid of the graphics screen with coordinates. Explain this is the same as positive and negative graph paper in geometry. Explain that SETPOS works as though the pen is down. PU is required to move turtle without making a line.

Project: Using turtle move, change the turtle location 4 times and find locations using SHOW POS. Stamp a shape in a non home position, find and record the position. Go home and then place the turtle in that location using SETPOS. Draw a square using SETPOS positions.

Challenge: Find the size of the graphics screen. How many turtle steps from top to bottom? How many steps from side to side?

Additional Challenge: Draw a spiral design using SETPOS that will go from the center to the outside of the screen. Put names on page and PRINTSCREEN.

Lesson 19: Using more than one Turtle. Commands introduced: tell all [TELL ALL], tell turtle #1 [TELL 1], [TELL 2], [TELL 3], [TELL 0]. Use overhead. Explain that there are 4 turtles on the screen. Only turtle 0 has been used up to now. All turtles can be controlled but must be instructed on exactly what to do. The turtles all have a home but it is not the SETPOS [0 0] that turtle 0 has. Exercise: Find the coordinates for all turtles.

Project: Set each turtle to a different color. Write a distinct and different procedure for each turtle. Label each procedure: turtle0, turtle1, turtle2,

procedure for each turtle. Label each procedure: turtle0, turtle1, turtle2, turtle3. Create super-procedure runturtle which includes the 4 turtle procedures. Run "runturtle". Note: Every turtle must be told everything!

Challenge: Make the Olympic rings using SETPOS, SETC, REPEAT. Hint: One turtle will have to make 2 rings!

Lesson 20: Integrate usage of SETPOS and TELL turtle. Using procedures, students are to create a unique graphic presentation using 4 turtles. Each turtle will have a different design to draw. The second procedure will use the command TELL ALL. The two procedures will be linked by a Super-Procedure.

Project: Create a unique graphic design using the above parameters.

Challenge: Expand the idea having each turtle take on a different shape, then use stamp and shade. Perhaps divide the screen first and then have the turtles take an area.

Lesson 21: Introduce TONE command. Demonstrate how TONE works and how to use the TONE command. Handout on notes and frequency numbers. Work through with class the length of notes for half, quarter, eighth, sixteenth. Indicate wait used as a rest.

Project: Students to experiment with TONE.

Challenge: Students to find sheet music and transpose music to LOGO program as homework assignment. After transposed work is written down, type into program.

Lesson 22: Integrate knowledge acquired. Students to create original programmed work using commands known.

Project: Develop a program less than 30 seconds using programming knowledge.

Challenge: Integrate TONE into a graphic program so it appears that both are running simultaneously.

Lesson 23: Continue with integration project. Students to use PR [ ] on the flip side to create a title page for use with the original work. Emphasis placed on original non repeating/non tracing work with TONE integrated into the program.

program.

Project: Finalize final work with timing of work with stopwatch. Clean up programs if necessary for readability. Label all procedures and super-procedure. Class to printout programs on hard copy.

Challenge: Add a exit screen to program, thanking viewer or listing credits.

Lesson 24: Students to view programs on overhead projector. Class will study FLIP SIDE and hard copy programs to understand the methods used to generate the programs on the graphic screen.

Project: Appreciate the originality of others programming skills. Understand differing methods and styles of programming. Note clarity of programming style.

Challenge: Make the intro screen and exit screen scroll up the page.

For additional information on LOGOWriter
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