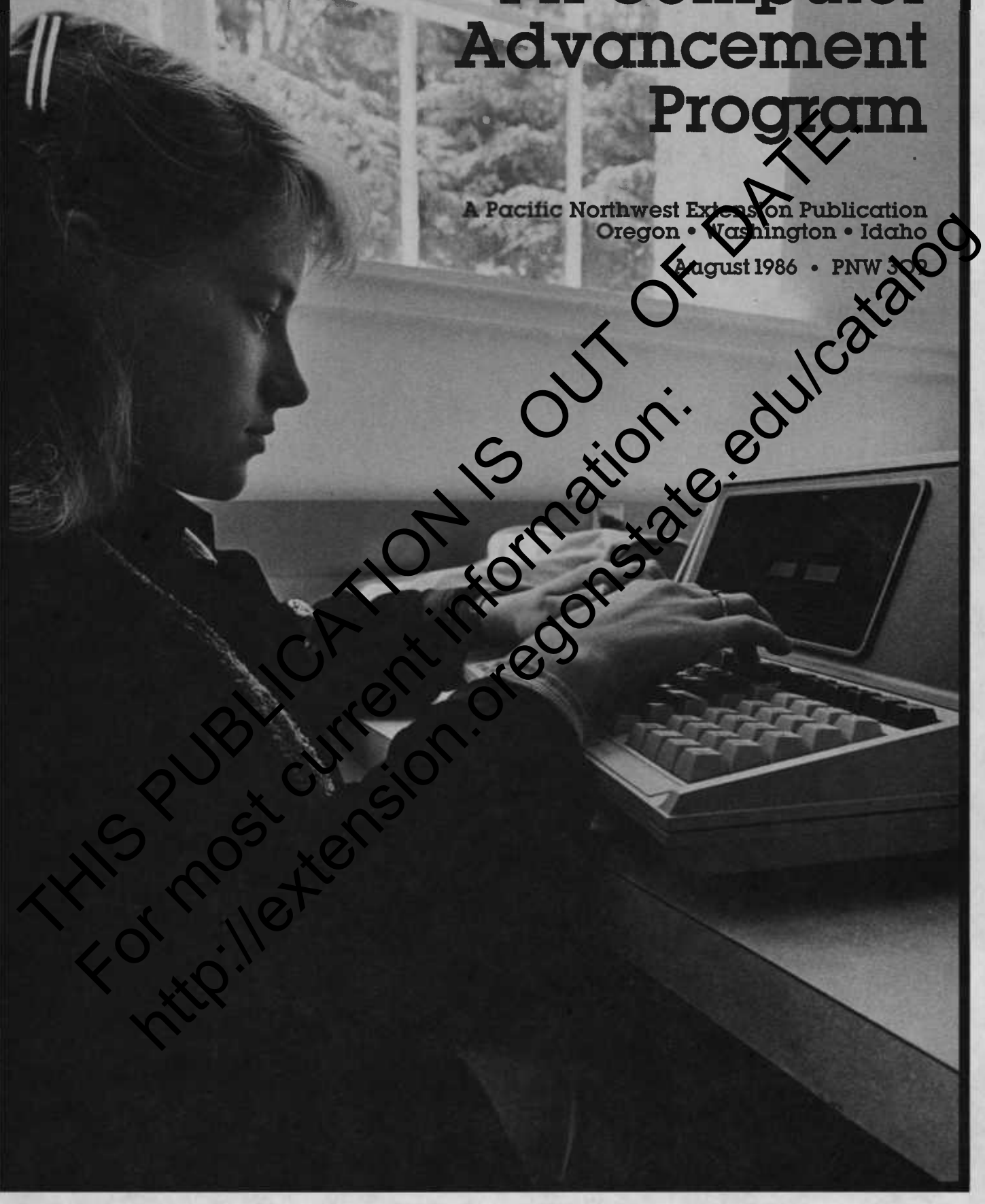


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4-H Computer Advancement Program

A Pacific Northwest Extension Publication
Oregon • Washington • Idaho

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This publication was prepared by Richard L. Best, Multnomah County Extension agent, 4-H; Timothy L. Cross, Extension computer applications coordinator, Oregon State University; Sheila Seeber and Nancy Varden, volunteer 4-H leaders; and Lyla E. Houghlum, Extension specialist, 4-H and youth development. Reviewed by the Tri-State Computer Development Committee and the Oregon 4-H Computer Development Committee.

4-H Computer Advancement Program

R. L. Best, T. L. Cross, S. Seeber, N. Vandelin, and L. E. Houglum

The 4-H Computer Advancement Program will:

- Make your computer project more interesting.
- Help you learn about computers, software, and programming.
- Increase your skill with computers.
- Provide you with new, enjoyable experiences.
- Allow you to advance according to your ability, interest, and enthusiasm.

The 4-H Computer Advancement Program is an important part of your computer project. It should be included as part of your project records. Many of the answers to the questions asked in the Advancement Program can be found in the 4-H Computer Project manuals. Additional information about your project may be found in other publications on computers, usually available at your library.

Plan with your leader the options you would like to work on. As you complete each option, fill in the date and have your leader or examiner (junior leader, parent, or other designated person) sign it.

When you have passed Level 1, go on to Levels 2, 3, 4, and 5. You can do options for higher levels while you are working on a lower level, but you can't qualify to complete the higher level until you have completed and been approved on all preceding levels.

Study each option carefully. Enjoy the new challenge.

Note that you may elect to substitute skill, personal development, and community service options of your own choice, not listed in this program, by first obtaining your leader's permission. Options marked with an asterisk (*) are required.

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Level 1

This is the first step in the 4-H Computer Advancement Program. When you complete 12 skill options, 4 personal development options, 1 community service option, and have your leader's approval, you have completed Level 1. Options marked with asterisk (*) are required.

I. Skill Options

Plan to do	Date passed	Approved by
------------	-------------	-------------

- | | | |
|---|-------|-------|
| *1. Define and explain the following terms:
Disk drive or tape drive | _____ | _____ |
| Keyboard | _____ | _____ |
| RAM memory | _____ | _____ |
| ROM memory | _____ | _____ |
| Printer and/or video display | _____ | _____ |
| Hardware | _____ | _____ |
| Software | _____ | _____ |
| CPU | _____ | _____ |
| 2. What are two advantages of using computers? | _____ | _____ |
| *3. Demonstrate correct operation of a disk drive or tape drive. | _____ | _____ |
| *4. Explain how to handle and properly care for diskettes or cassette tapes. | _____ | _____ |
| 5. Draw a picture of the computer you use and label the parts. | _____ | _____ |
| 6. List at least 10 uses for a computer. | _____ | _____ |
| 7. Define the function of non-number and non-letter keys on the computer keyboard. | _____ | _____ |
| *8. Demonstrate how to load or boot a program. | _____ | _____ |
| 9. Demonstrate how to initialize or format a diskette. | _____ | _____ |
| *10. Demonstrate how the following commands are used:
Save | _____ | _____ |
| Run | _____ | _____ |
| List | _____ | _____ |
| 11. Starting from scratch, hook up a computer. | _____ | _____ |
| 12. Role-play a computer or robot following a sequence of instructions. | _____ | _____ |
| *13. Write a simple program using at least three different commands. | _____ | _____ |
| 14. Write a program that will print your name. | _____ | _____ |
| 15. Use your computer to do an addition, subtraction, multiplication, and division problem. | _____ | _____ |
| 16. Demonstrate the use of a REM (remark) statement. | _____ | _____ |
| 17. Demonstrate the use of variables for characters and numbers. | _____ | _____ |
| 18. Demonstrate the use of direct input from a user in a program. | _____ | _____ |
| 19. Write a simple adventure program. | _____ | _____ |
| 20. Edit a line of a program that either you or someone else has written. | _____ | _____ |
| *21. Describe why a surge protector is needed and what it does. | _____ | _____ |
| 22. What is meant by a dot matrix style printer? | _____ | _____ |
| 23. What is meant by the terms floppy disk and hard disk? | _____ | _____ |

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	Plan to do	Date passed	Approved by
24. With LOGO in graphics mode, use REPEAT to write a procedure for a square or triangle.	_____	_____	_____
25. With LOGO in edit mode, write a procedure and save it on diskette. Be sure to use a diskette you have formatted for LOGO files.	_____	_____	_____
26. Write a LOGO procedure to draw a five-point star.	_____	_____	_____
27. Your own options (approved by your leader).	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

24. With LOGO in graphics mode, use **REPEAT** to write a procedure for a square or triangle.
25. With LOGO in edit mode, write a procedure and save it on diskette. Be sure to use a diskette you have formatted for LOGO files.
26. Write a LOGO procedure to draw a five-point star.
27. Your own options (approved by your leader).

II. Personal Development Options

Select two additional options from page 14.

- *1. Give an oral presentation to your club.
- *2. Keep a record of your computer project.
- 3.
- 4.

III. Community Service Option

Select one from page 15. This option may be done individually or as a club activity.

- 1.

_____ has completed all requirements for Level 1 of the 4-H Computer Advancement Program.

Name of 4-H Member

Date _____

Approved by: _____

Advancement Program Chair

Club Leader



Level 2

When you complete 10 skill options (at least 2 in each of the four areas), 4 personal development options, 1 community service option, and have your leader's approval, you have completed Level 2. Options marked with an asterisk (*) are required.

I. Skill Options

Plan to do

Date passed

Approved by

A. Computer literacy (pick two to four)

1. List two books you have used that specialize in your model of computer. _____
2. Visit a business using computers and describe how they are being used. _____
3. List four examples of careers created directly by the computer industry. _____
4. List four examples of careers that have been changed due to the use of computers. _____
5. Describe ways of protecting computer data from damage. _____
6. Describe three potential uses for a computer in the home, school, recreation, and business. _____
7. Describe the difference between a voltage regulator and a surge protector. _____
8. What is a Disk Operating System? _____
9. Demonstrate keyboard skills by typing 20 words per minute. Include the use of numerals. _____
10. Name three ways that the use of computers can affect privacy. _____
11. Explain the term *networking* as it applies to computers. _____
12. Define computer piracy and explain why it is illegal. _____
13. Define what a file is and how it is used. _____
14. Other _____

B. Programming (pick two to four)

- *1. Write a simple program using at least five different commands. _____
2. Demonstrate how you would stop a program properly. _____
3. Demonstrate the use of ; with the print statement. _____
4. Use a conditional statement (example: IF... THEN). _____
5. Use a branch statement (example: GOTO or GOSUB) in a program. _____
6. Use a loop statement (example: FOR...NEXT) in a program. _____
7. Demonstrate how to generate random numbers in a program. _____
8. Modify a simple program to obtain different results. _____
9. Demonstrate the order in which the computer does arithmetic computation. _____
10. Document a program. _____
11. Write a LOGO procedure using three or more smaller procedures that you have defined and saved. (Example: a picture made of shapes such as a house that includes a rectangle, square, and triangle.) _____
12. Use LOGO to demonstrate the use of variables to spin or spiral one of your simpler shapes. _____
13. Other _____

C. Hardware (pick two to four)

- *1. Demonstrate the use of a disk drive (if not completed in Level I). _____
2. Demonstrate the use of a printer. _____
3. Demonstrate proper cleaning of the disk drive heads. _____

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	Plan to do	Date passed	Approved by
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- | | | | |
|--|-------|-------|-------|
| 4. Explain why disk drives need to be aligned occasionally and find out where to have it done. | _____ | _____ | _____ |
| 5. Demonstrate the use of a graphics tablet (Koala®), mouse, or light pen. | _____ | _____ | _____ |
| 6. Demonstrate printer ribbon replacement. | _____ | _____ | _____ |
| 7. Other _____ | _____ | _____ | _____ |

D. Software application (pick two to four)

- | | | | |
|---|-------|-------|-------|
| *1. Use a word processor to write a short note or use a commercial piece of business application software. | _____ | _____ | _____ |
| 2. Collect several computer-generated letters, bank statements, receipts, or bills that your family has received at home and share them with your club members. | _____ | _____ | _____ |
| 3. List three samples each of recreational, educational, and business software. | _____ | _____ | _____ |
| 4. Demonstrate how to initialize or format a diskette (if not yet completed). | _____ | _____ | _____ |
| 5. Demonstrate the procedure used to determine the contents of a diskette. | _____ | _____ | _____ |
| 6. Use Print Shop®, Newsroom®, or similar programs that integrate text and graphics. | _____ | _____ | _____ |
| 7. Create a file using a software package. | _____ | _____ | _____ |
| 8. Use a word processing program to write your 4-H story. | _____ | _____ | _____ |
| 9. Demonstrate how to copy the entire contents of a diskette (backup diskette). | _____ | _____ | _____ |
| 10. Other _____ | _____ | _____ | _____ |

II. Personal Development Options

Select two additional options from page 14.

- | | | | |
|---|-------|-------|-------|
| *1. Give an oral presentation to your club. | _____ | _____ | _____ |
| *2. Keep a record of your computer project. | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |

III. Community Service Options

Select one from page 15. This option may be done individually or as a club activity.

- | | | | |
|----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
|----------|-------|-------|-------|

_____	has completed all requirements for Level 2 of the 4-H Computer Advancement Program.
<small>Name of 4-H Member</small>	
_____	Approved by: _____
<small>Date</small>	<small>Advancement Program Chair</small>

	<small>Club Leader</small>



Level 3

When you complete 10 skill options (at least 1 in each area), 4 personal development options, 1 community service option, and have your leader's approval, you have completed Level 3. Options marked with an asterisk (*) are required.

I. Skill Options

**Plan
to do**

**Date
passed**

**Approved
by**

A. *Computer literacy* (pick one to seven)

1. Demonstrate keyboard skill by typing 20 words per minute using a programming language.
2. Compare and contrast the important characteristics of major computer brands.
3. List the names of five computer magazines and what, if anything, they specialize in.
4. Name a computer magazine that is on tape or disk.
5. What does the term *baud* mean and how is it used?
6. Explain what is meant by *pixel*.
7. Explain what the term *RS-232* means.
8. Describe how computers use the binary digit system.
9. Describe three positive and three negative impacts that computers have on society.
10. Other _____

B. *Programming* (pick one to seven)

1. Demonstrate nesting of conditional and branching statements in a program.
2. Use a flow chart to outline your program before writing it.
3. Use a one-dimensional array in a program and explain what it represents.
4. Write a simple graphics program.
5. Analyze a program before you run it and predict the results.
6. Write a program to encode and decode secret messages.
7. Use string manipulators and strings in a program.
8. Use a **GOSUB** statement and a "subroutine" in a program.
9. Write a program that saves to and accesses information from a text data file.
10. Use **READ** and a **DATA** statement in a program.
11. Other _____

C. *Hardware* (pick one to six)

1. Demonstrate the use of a modem.
2. Check your disk drive speed.
3. Compare printer characteristics and printers vs. plotters.
4. Describe how robots are used in industry.
5. Use control characters to change fonts, etc., with your printer.
6. Other _____

Plan to do	Date passed	Approved by
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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Plan
to do

Date
passed

Approved
by

D. Software application (pick one to seven)

1. Compare and contrast two different programs designed for one specific function.
2. Develop a template for a spreadsheet program.
3. Use a word processor to write and edit a two-page paper or report.
4. Use an evaluation of a piece of software.
5. List five household items that use microcomputer technology.
6. Identify the functions of a database management system.
7. Use a database management system to store, sort, and retrieve data.
8. Describe the use of the personal computer as a communication medium.
9. Demonstrate the procedure used to eliminate an unwanted file on a diskette.
10. Demonstrate the procedure used to rename a file or program on a diskette.
11. Name an integrated software package and describe its capabilities.
12. Name a computer utilities program and describe its capabilities.
13. Use a wordprocessing program to write your 4-H story.
14. Other _____

Plan to do	Date passed	Approved by
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

II. Personal Development Options

Select two additional options from page 14.

- *1. Give an oral presentation to your club.
- *2. Keep a record of your computer projects.
- 3.
- 4.

Plan to do	Date passed	Approved by
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

III. Community Service Option

Select one from page 15. This option may be done individually or as a club activity.

- 1.

Plan to do	Date passed	Approved by
_____	_____	_____

_____ <small>Name of 4-H Member</small> Program.	has completed all requirements for Level 3 of the 4-H Computer Advancement Program.
_____ <small>Date</small>	Approved by: _____ <small>Advancement Program Chair</small> _____ <small>Club Leader</small>

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Level 4

When you complete 10 different skill options (at least 1 in each of the 4 areas), 4 personal development options, 1 community service option, and have your leader's approval, you have completed Level 4. Options marked with an asterisk (*) are required.

I. Skill Options

Plan to do	Date passed	Approved by
------------	-------------	-------------

A. Computer literacy (pick one to seven)

- | | | |
|--|-------|-------|
| 1. Explain what ASCII means and why it is important to computers. | _____ | _____ |
| 2. Explain what <i>assembly language</i> is. | _____ | _____ |
| 3. List three books you have read pertaining to computers. | _____ | _____ |
| 4. Describe the difference between machine language and a high level language such as BASIC. | _____ | _____ |
| 5. Describe what <i>electronic mail</i> is and how it works. | _____ | _____ |
| 6. Explain what an <i>interrupt</i> is and how it is used by computers. | _____ | _____ |
| 7. Explain the terms CLEAR TO SEND and DATA SET READY regarding modems. | _____ | _____ |
| 8. Explain what is meant by <i>centronics interface</i> and draw the connections. | _____ | _____ |
| 9. Define the difference between a compiled and an interpreted language. | _____ | _____ |
| 10. Other _____ | _____ | _____ |

B. Programming (pick one to seven)

- | | | |
|---|-------|-------|
| 1. Compare the syntax of different versions of BASIC (GET statements for <i>Commodore</i> vs. <i>Apple</i>). | _____ | _____ |
| 2. Compare the syntax of different versions of LOGO. | _____ | _____ |
| 3. Write a program that will convert lowercase letters to uppercase. | _____ | _____ |
| 4. Write a program to find and print all the prime numbers between 1 and 100. | _____ | _____ |
| 5. Use three or more nested FOR...NEXT loops in a program. | _____ | _____ |
| 6. Write a program that uses a controller (e.g., joystick, paddle, mouse). | _____ | _____ |
| 7. Write a program that will produce music on a computer. | _____ | _____ |
| 8. Write a simple character animation program in BASIC. | _____ | _____ |
| 9. Use a two-dimensional array in a program and explain what it represents. | _____ | _____ |
| 10. Write a program that uses sound and graphics to make it more entertaining or user-friendly. | _____ | _____ |
| 11. Other _____ | _____ | _____ |

C. Hardware (pick one to seven)

- | | | |
|--|-------|-------|
| 1. Describe the difference between parallel and serial output. | _____ | _____ |
| 2. List hardware computer occupations. | _____ | _____ |
| 3. Watch someone adjust disk speed. | _____ | _____ |
| 4. Construct a surge protector. | _____ | _____ |
| 5. Demonstrate the use of printer control codes, if not previously completed (e.g., to produce italics, boldface, etc.). | _____ | _____ |
| 6. Explain what a printer buffer does. | _____ | _____ |
| 7. Describe the function of a printer interface. | _____ | _____ |
| 8. Explain how information is stored on tape or disk. | _____ | _____ |
| 9. Other _____ | _____ | _____ |

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D. Software application (pick one to seven)

1. List examples of computer applications that are "invisible" to the public. _____
2. List three social factors that contribute to the future development of computer applications. _____
3. List three technological factors that contribute to the future development of computer applications. _____
4. List three social factors that inhibit the future development of computer applications. _____
5. List three technological factors that inhibit the future development of computer applications. _____
6. Use an electronic bulletin board. _____
7. Identify ways in which computers are used to control traffic. _____
8. Demonstrate how to copy a disk file. _____
9. Use a spreadsheet program in a home, school, or 4-H application. _____
10. Use a database manager to set up a recordkeeping system for your 4-H project. _____
11. Use a spreadsheet program with your 4-H project. _____
12. Use a wordprocessing program to write your 4-H story. _____
13. Transfer a spreadsheet file to a word processor. _____
14. Other _____

II. Personal Development Options

Select two additional options from page 14.

- *1. Give an oral presentation to your club. _____
- *2. Keep a record of your computer project. _____
3. _____
4. _____

III. Community Service Option

Select one from page 15. This option may be done individually or as a club activity.

1. _____

_____ <small>Name of 4-H Member</small> Program.	has completed all requirements for Level 4 of the 4-H Computer Advancement Program.
_____ <small>Date</small>	Approved by: _____ <small>Advancement Program Chair</small> _____ <small>Club Leader</small>

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Level 5

When you complete 10 skill options (at least 1 in each area), 4 personal development options, 1 community service option, and have your leader's approval, you have completed Level 5. Options marked with an asterisk (*) are required.

I. Skill Options

Plan to do

Date passed

Approved by

A. Computer literacy (pick one to seven)

1. Describe the future and social impact of artificial intelligence.
2. Explain what *assembly language* is and give examples for a particular CPU.
3. Explain how a laser printer operates.
4. Describe three applications of robotics.
5. Use your word processor to write a short report comparing how a business operates using computers with how it operated before computers.
6. Other _____

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

B. Programming (pick one to seven)

1. Translate a program for one machine to work on another.
2. Write a program in a language other than BASIC or LOGO.
3. Write an animation program.
4. Write a text editor program (simple wordprocessor program).
5. Submit an article to a computer magazine dealing with a programming problem.
6. Write a program to accomplish a specific task for someone.
7. Write a program in which there are at least two parts capable of independent use.
8. Write a program to produce a calendar for any particular month in a year.
9. Design a program to play a simple game (such as Tic Tac-Toe).
10. Write a program that uses a *shape table* or *sprite*.
11. Write a HI-RES screen dump.
12. Other _____

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

C. Hardware (pick one to seven)

1. Build a surge protector with a voltage regulator.
2. Adjust the disk drive speed.
3. Diagram and describe the operation of a disk drive.
4. Wire a simple light pen.
5. Build an interface for an input device such as a joystick.
6. Build a computer-controlled device.
7. Connect and program the computer to control a device.
8. Explain the difference between a floppy disk and hard disk drive.
9. Other _____

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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D. Software application (pick one to seven)

- | | | | |
|---|-------|-------|-------|
| 1. Use a computer program to simulate or model a situation. | _____ | _____ | _____ |
| 2. List five future applications of the computer. | _____ | _____ | _____ |
| 3. Write a program in dBASE II or other database using multiple data files. | _____ | _____ | _____ |
| 4. Use a word processor to create a two-column community newsletter. | _____ | _____ | _____ |
| 5. Use a database management program to create a household inventory. | _____ | _____ | _____ |
| 6. Use a database to develop a cookbook that sorts according to ingredient and by type of dish. | _____ | _____ | _____ |
| 7. Use a spreadsheet program in a home, school, or 4-H application. | _____ | _____ | _____ |
| 8. Other _____ | _____ | _____ | _____ |

II. Personal Development Options

Select two additional options from page 14.

- | | | | |
|---|-------|-------|-------|
| *1. Give an oral presentation to your club. | _____ | _____ | _____ |
| *2. Keep a record of your computer project. | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |

III. Community Service Option

Select one from page 15. This option may be done individually or as a club activity.

- | | | | |
|----------|-------|-------|-------|
| 1. _____ | _____ | _____ | _____ |
|----------|-------|-------|-------|

_____ has completed all requirements for Level 5 of the 4-H Computer Advancement Program.

Name of 4-H Member

Date _____

Approved by: _____

Advancement Program Chair

Club Leader

Personal Development Options

Select different options at each skill level. The following list is just a beginning. Be creative!

1. Lead the Pledge of Allegiance and 4-H Pledge at 4-H meetings.
2. Lead a song or a game at a 4-H meeting.
3. Preside at a meeting at your 4-H club.
4. Write a news story for a local paper or the 4-H Computergram.
5. Participate in a radio or television program.
6. Give an oral presentation to a group other than your club.
7. Serve as host for a 4-H meeting. See that everyone is welcomed and made comfortable.
8. Serve as chairman of a club committee.
9. Participate in a judging contest.
10. Serve as a junior leader.
11. Serve as a teen leader.
12. Attend 4-H camp.
13. Attend a 4-H statewide activity other than the state fair.
14. Serve as clerk, chairman, or apprentice judge at a 4-H show.
15. Develop and exhibit a science display which is related to computers.
16. Serve as a camp counselor.
17. Make tour arrangements for your club.
18. Arrange for a film or slide set to be shown at your club meetings.
19. Secure a speaker to talk at your club meeting.
20. Prepare and give a public presentation on one recommended practice in using the computer.
21. Explore a career associated with computers and report at your club meeting.
22. Attend a computer show or seminar and give a report at your club meeting.
23. Many other options (leader approved).

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Community Service Options

Select different options at each level. The following list is just a beginning. Be creative!

1. Publish a community newsletter.
2. Print labels for a nonprofit organization.
3. Help with a computer activity at a community Fun Day.
4. Visit with community officials about the 4-H computer project.
5. Write a program for a nonprofit organization.
6. Participate in an action booth or develop a club display for a community activity.
7. Share your knowledge about computers by helping teach a class.
8. Use your computer skills to help another person or community group to solve a problem.
9. Volunteer to help enter data on the computer at the Extension office.
10. Help a non-computer club member use the computer with a 4-H project.
11. Print flyers, posters, or banners for a community event.
12. Create an exhibit to promote the 4-H Computer Project in your community.
13. Compile a bibliography of 10 or more computer books, periodicals, or media resources available in your school or public library. Ask the librarian for help if needed, and share your results with others.
14. Many other options (approved by your leader).

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