



# COMPUTER TIP SHEET

General/Natural  
Resources Projects

## Project Information

### 4-H Computer Project

4-H Computers is a Computer Science Project for 4-H members interested in gaining experience in computer building, repairing and networking. Our goal is to engage, young people and their project helpers in computer science activities and community service. A web site provides links and resources to a variety of extended learning opportunities in topics such as open source software development and learning programming language and programming skill development such as fundamental concepts like sequencing, iteration, conditionals, variables and modulation. Each guide in the Computer Power Unlimited Series (Newbie Know-How, Inside the Box, Peer to Peer and Teens Teaching Technology) is designed with a specific purpose, and collectively, the series supports youth and their adult helpers in the pursuit of technological competence and meaningful leadership.

### Newbie Know-How

Newbie Know-How is a resource for beginners that can be used with Teens Teaching Tech. This part of the Computer Power Unlimited series is for youth with little or no experience with computers. This unit is for Juniors, Intermediates and Seniors, but designed for first time computer users. Members must have access to the internet for this unit. Youth in this unit have the potential of gaining knowledge on a variety of topics including but not limited to: parts of a computer (external and internal) and their function, keyboarding and typing skill development (including keyboard shortcuts), basic computer terminology, beginning word processing and database entry skills, developing computer presentations, basic computer care, learning about computer use in careers, creation of various documents such as flyers, banners and word documents, search engines, messaging and communicating, virus protection, menu commands, age-appropriate and learning gaming, use of software and history of computers.

### Inside the Box

Inside the Box helps youth discover the inner workings of computer hardware—the parts, the ports, the operating systems that make it run, how to diagnose and fix problems and how to help computers run smoother and faster. This unit is for Intermediates and Seniors. Youth in this unit can gain knowledge on a variety of topics including but not limited to: caring for your computer (computer viruses and backing up, defragmentation, et al), computer consumer skill development, advanced word processing, advanced spread sheets, advanced computer presentation skill development, safety and protection on the internet, using online databases and developing databases, using e-mail and developing e-mail etiquette, utilizing internet tools (downloading and uploading), learning about parts and ports on the computer, building and designing your own PC or laptop, troubleshooting computer problems, understanding bits and bytes, operating systems, recycling computers and components, open source contributions, using discretion in making decisions about online material, operating system knowledge development, basic web development, advanced age-appropriate learning computer gaming.

## Project Information Continued

### Peer to Peer

Peer to Peer focuses on networking computers and making decisions about the ethical and safety issues involved in networking. They will analyze the negative impacts that exist as a result of networking, such as viruses and hacking. This unit is for Intermediates and Seniors. Youth in this unit have the potential of gaining knowledge on a variety of topics including but not limited to: network infrastructure and hookup, building a network, working with basic programming languages and writing programs, encryption, web development, protocols, home networking, network safety, hacking, and age appropriate gaming.

### Teens Teaching Technology

Teens Teaching Technology focuses on networking computers together and making decisions about the ethical and safety issues involved in networking. This may include creating a community-based computer lab and developing lesson plans to teach diverse populations basic computer skills. Youth in this unit will teach and develop public speaking and presentation skills on topics learned in previous units. Youth in this unit can explore crowd sourcing, citizen science, networks of resources, tutorials and online courses and learning ways to communicate results and work accomplished.

### Discovering Computer Science and Programming Through Scratch

This curriculum introduces young people to five fundamental principles of computer programming, providing a foundation for exploring and creating. Scratch is a project of the Lifelong Kindergarten Group at the MIT Media Lab. Each youth in a group should have his/her own guidebook. In Discovering Computer Science & Programming through Scratch, youth interact with a series of tutorials and challenges within the Scratch environment. Youth can work on the activities individually, with partners, or in a guided instructional setting. Designed for grades 6-8.

### Computers in the 21st Century

Youth will learn and demonstrate the use of specific computing skills related to 21st century emerging technologies. This unit is for Intermediates and Seniors. Youth in this unit can gain knowledge on a variety of topics including but not limited to: application design, operation and development, development and personalization of operating systems (such as Linux), advanced programming language use and writing code to perform tasks, utilization or research of SMART systems (such as SMART homes, et al), development and proper utilization of social networking with considerations of professionalism, researching careers that utilize computer skills (such as online marketing, computer programming, web development, app creation and design, et al), advanced web design and development, working with SMART devices and maximizing their potential, game development and use of crowd sourcing. Completed projects in this unit could include building your own microcontroller projects (like with Arduino, Raspberry Pi, Spark-Fun Inventor's Kit, et al), code an App for a mobile device, complete a program/game using code, design and build a network to connect multiple devices, design and create your own website, use Makey Makey to solve a problem or create a tool and much more.



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## Literature Needed:

### Leader Literature

MC0201A Newbie Know-How Unit 1 Jr./Int./Sr.

MC0202A Inside the Box Unit 2 Jr./Int./Sr.

MC0203A Peer to Peer Unit 3 Int./Sr.

MC0204 Teens Teaching Tech Unit 4 Sr.

MC0206A Discovering Computer Science Facilitator Guide

Computers in the 21st Century will use the Discovering Computer Science materials

### Member Literature

MC0201A Newbie Know-How Unit 1 Jr./Int./Sr.

MC0202A Inside the Box Unit 2 Jr./Int./Sr.

MC0203A Peer to Peer Unit 3 Int./Sr.

MC0204 Teens Teaching Tech Unit 4 Sr.

Computers in the 21st Century Int/Sr. --youth will use the Discovering Computer Science Youth Guide

MC0205A Discovering Computer Science Youth Guide

Exhibit Requirements can be found at:

[http://www.colorado4h.org/projects\\_resources/StateFairExhibitReq.pdf](http://www.colorado4h.org/projects_resources/StateFairExhibitReq.pdf)

Score Sheets can be found at:

[http://www.colorado4h.org/evenopportunities/state\\_fair/score\\_sheets/index.php](http://www.colorado4h.org/evenopportunities/state_fair/score_sheets/index.php)

e-Record can be found at:

[http://www.colorado4h.org/projects\\_resources/erecords/index.php](http://www.colorado4h.org/projects_resources/erecords/index.php)

## Resources

National 4-H Computers (Newbie Know How, Inside the Box, Peer to Peer and Teens Teaching Technology)

<http://4-h.org/parents/curriculum/computer>

Scratch: <https://scratch.mit.edu/>

CSUnplugged: <http://csunplugged.org/>

Technovation for Girls: <http://www.technovationchallenge.org/>

Sploder: Where Games Come True: <http://www.sploder.com/>

Invent with Python: <http://inventwithpython.com/>

RoboMind: <http://www.robomind.net/en/>

CodeBender: <https://codebender.cc/>

Discover 4-H Coding Clubs: <http://utah4h.org/discover/>



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## New Exhibit Requirements

All exhibits will consist of the following:

A. One sturdy binder/notebook that contains the project manual or copy of page 5 - Achievement Program Requirements with explored areas completed (page 5 of manual for Units: Newbie Know-How, Inside the Box, Peer to Peer and Teens Teaching Technology only) or the Discovering Computer Science & Programming Through Scratch manuals for that unit (Discovering Computer Science & Programming Through Scratch and Computers in the 21st Century) and completed e-Record.

B. A completed exhibit consists of ONE of the following:

1. A display board illustrating a topic learned as a part of the 4-H project. Potential display ideas can be found in the Expand Your Memory in the manual for Newbie Know-How, Inside the Box, P2P-Peer to Peer and Teens Teaching Tech only. The standardized display board size of 4 ft. x 3 ft. is to be used with 4-H projects. No additional items may be included in front of display board. All items must be attached to display boards.
2. A stand-alone exhibit demonstrating a skill learned or an item developed. For example, a Makey Makey keyboard or a micro controller project. All stand-alone projects are subject to risks of display at county and state fair if eligible.
3. A CD or DVD with the program or a video of the project. This CD or DVD must be playable on a PC.

C. Project will be evaluated on the quality of the information completed in the e-record (25 percent) and quality of the exhibit (75 percent).

Note: For more information on displays and projects go to [http://www.colorado4h.org/project\\_resources/StateFairExhibitReq.pdf](http://www.colorado4h.org/project_resources/StateFairExhibitReq.pdf) and look under Display Hints and Tips and Project Tip

## Project Tips:

- Project manual is required as part of the exhibit for Units 1-4. Computers in the 21st Century only needs the computer e-record.
- Complete page 5 of the manual
- Members may stay in an unit for more than one year. The exhibit must be different each year.
- Display items must be self-contained and capable of being judge "as is". Example: Sample printouts of code developed, multimedia projects created or Web pages/sites developed.
- No three-dimensional displays will be accepted.
- Enter your project in the county fair.
- Share information learned in talks and displays.

## Judging Criteria:

- Completeness of project and e-record.
- E-record includes demonstrations, talks, story, and pictures, with at least one action shot of the member doing something with their project.
- Neatness and legibility
- How you completed your activities and quality of exhibit.