

COMPUTER SCIENCE

PLEASE NOTE: Any changes/updates from the previous year will be BOLD and ITALICIZED! Pay special attention to any projects with BOLD, ITALICIZED WORDS because they have changed from last year.

The 4-H computer science project is designed for youth to engage in an interactive project to learn all levels of familiarity with computers.

Completion, exhibition participation, and State Fair information for Computers			
Division/Level	Grades <i>(suggested)</i>	Completion Activities Needed*	Maximum State Fair Entries
Level 1 <i>Beginner</i>	Grades 3-5	4 activities*	1 entry
Level 2 <i>Intermediate</i>	Grades 6-8	4 activities*	1 entry
Level 3 <i>Advanced</i>	Grades 9-12	4 activities*	1 entry

*"Activities" are defined as project manual activities and/or Hendricks County 4-H Workshops related to this topic. Members must be able to prove attendance by getting a signature from 4-H Leader/Project Advisor that conducts the workshop. Activity sheets available in the Extension Office with Computer Project Manuals. Fair Exhibit guidelines are listed below.

Remember: All posters, notebooks, and display boards **MUST** include a reference list indicating where information was obtained, giving credit to the original author, to complete the 4-H member's exhibit. This reference list should/might include web site links, people and professionals interviewed, books, magazines, etc. It is recommended this reference list be attached to the back of a poster or display board, be the last page of a notebook, or included as part of the display visible to the public. A judge is not to discredit an exhibit for the way references are listed. Reference Sheets are available at the Extension Office for use if needed. For personal safety, do not include personally identifiable information such as mailing address or phone numbers on posters/displays/exhibits.

GUIDELINES:

- Refer to the Hendricks County 4-H Policies, Entry & Exhibit Guidelines for poster and general display guidelines.***
- Exhibits are to be skill appropriate for the member's grade level.
- Youth enrolled in the computer project will select one of the below subject categories to study, regardless of grade. Youth may choose to create an exhibit demonstrating skills learned during the year. Check with your county Purdue Extension Office to determine if a computer will be available during judging and if there will be an opportunity to explain your exhibit to the judge.
- Exhibits qualifying for state fair are to be submitted on a thumb drive securely attached to a notebook/portfolio describing accomplishments, skills learned, design ideas, budget, a summary of what was done, screenshots showing the development and final project, etc. as the exhibitor will not be able to discuss their work with a judge.
- Poster and display board exhibits are permissible. Posters are to be 22"x28" and displayed horizontally and placed in a clear plastic sleeve or covered with clear plastic to protect contents. Display boards should be designed to sit on a table using no more than 36" of tabletop space. Space should be left in the lower right hand corner to place an exhibit tag provided by Purdue Extension staff. Youth may continue in the same subject category in subsequent years expand on the previous year's topic, or choose a new topic.***
- Subject categories are:
 - Block Based Programming
 - Text Based Programming
 - Web Design and Computer Entrepreneurship
 - Computer Forensics
 - Hardware and Networking Design/Install/Repair
 - Graphic Design and Computer Art
 - Robotics

Software submitted to be reviewed by a judge must be compatible on both PC, Mac platform. If additional software other than Microsoft Office Suite is required to view the member's work, that software must be provided by the member and comply with all manufacturer copyright laws. Apps can be Android or IOS compatible. ***Grade breakdowns are suggestions.***

EXHIBIT CLASSES:

Blocked Based Programming:

Beginner – Grades 3-5 – Create a block based program using Scratch, Code Studio, Alice, or another graphic programming language of your choice. You should comment your work and it must include at least ten different commands. Skills this program could use are:

- Sequence
- Iteration
- Conditionals
- Variables
- Loops
- User input
- Any other similar skill

Intermediate Grades 6-8 – Create a block based program using Scratch, Code Studio, Alice, or another graphic programming language of your choice. You should comment your work and it must include at least ten different commands. Skills this program could use are:

- More robust demonstration of beginner skills
- Modularization
- Lists
- Any other similar skill

Advanced Grades 9-12 – Create a block based program using Scratch, Code Studio, Alice, or another graphic programming language of your choice. You should comment your work and it must include at least ten different commands. Skills this program could use are:

- More robust demonstration of Intermediate Skills
- Parameters
- Recursion
- Any other similar skill

Text Based Programming

Beginner Grades 3-5 – This option is not available.

Intermediate Grades 6-8 - Create a text based program of your choosing using any text based language you are comfortable in. The code should demonstrate an understanding of at least 4 of these skills:

- Commenting
- Correct syntax
- Variables
- Loops
- Conditionals
- User Input
- Lists
- Functions
- Algorithms
- Any other similar skill

Advanced Grades 9-12 - Create a text based program of your choosing using any text based language you are comfortable in. The code should demonstrate an understanding of at least 8 of these skills:

- A more robust understanding of the intermediate skills
- Interact with databases
- Classes
- Any other similar skill
- Objects
- Methods
- Inheritance
- Integrate multiple languages into one program

Web Design and Computer Entrepreneurship

Beginner Web Design and Computer Entrepreneurship – Grades 3-5 - Build a website demonstrating a knowledge of:

- Use a website builder to create your website

- Insert non-stock image into your site
- Use a template to achieve a unified look
- Explain CSS in your documentation, what CSS is and why it's important
- Must have at least two pages and include all items listed above

Intermediate Web Design and Computer Entrepreneurship – Grades 6-8 - Build a website demonstrating a knowledge of:

- Create your own site or use a website builder
- Modify existing HTML
- Use HTML5
- Modify existing CSS
- Have a unified theme throughout
- Use a photo editing software to create custom images
- Must have at least five pages and include all items listed above

Advanced Web Design and Computer Entrepreneurship – Grades 9-12 - Build a website demonstrating a knowledge of:

- Create a custom site using appropriate industry tools
- Have a responsive website
- Add useful and appropriate plugins
- Test for and eliminate bugs
- Include links for social media
- Include custom audio/video
- Must have at least ten pages and include all items listed above

Computer Forensics (id theft, online bullying, ethical use of technology, responsible social media use)

Beginner Computer Forensics – Grades 3-5 – Research and create a 3-5 minute presentation on one of the following topics. Present to a group of peers and have an adult leader verify, create a YouTube or MP4 instructional video, or printed slides and notes using PowerPoint or similar presentation software.

- Media Balance and Well Being
- Privacy and Security
- Digital Footprint and Identity
- Relationships and Communication
- Cyberbullying, Digital Drama and Hate Speech
- News and Media Literacy
- Any other similar topic

Intermediate Computer Forensics – Grades 6-8 – Research and create a 6-8 minute presentation on one of the following topics. Present to a group of peers and have an adult leader verify, create a YouTube or MP4 instructional video, or printed slides and notes using PowerPoint or similar presentation software.

- Digital Citizenship:
 - Media Balance and Well Being
 - Privacy and Security
 - Digital Footprint and Identity
 - Relationships and Communication
 - Cyberbullying, Digital Drama and Hate Speech
 - News and Media Literacy
- Cyber Security
 - Ethics and Society
 - Security Principles
 - Classic Cryptography
 - Malicious Software
 - Physical Security
 - Web Security
- Any other similar topic

Advanced Computer Forensics – Grades 9-12 – Research and create a 10-12 minute presentation on one of the following topics. Present to a group of peers and have an adult leader verify, create a YouTube or MP4 instructional video, or printed slides and notes using PowerPoint or similar presentation software.

- Digital Citizenship:
 - Media Balance and Well Being
 - Privacy and Security
 - Digital Footprint and Identity
 - Relationships and Communication
 - Cyberbullying, Digital Drama and Hate Speech
 - News and Media Literacy
- Cyber Security
 - Ethics and Society
 - Security Principles
 - Classic Cryptography
 - Malicious Software
 - Physical Security
 - Web Security
 - Any other similar topic

Hardware and Networking Design/Install/Repair

Beginner – Grades 3-5 – Choose 1-2 items from the list and create a report/presentation (including images) of what you did.

- Deconstruct and reconstruct a computer
- Learn and report how binary works and how computers use numbers
- Troubleshoot hardware problems
- Explore operating systems
- Investigate open source resources
- Install/upgrade operating systems
- Design a dream machine (give reasons)
- Any other similar design/install/repair

Intermediate – Grades 6-8 – Choose 1-2 items from the list and create a report/presentation (including images) of what you did.

- Identify network hardware
- Design a computer network
- Explain Internet Protocol
- Explain different types of servers
- Use different protocols to communicate
- Add peripherals to a network
- Secure a networked computer
- Share applications simultaneously
- Setup a Raspberry Pi or other micro-controller
- Any other similar design/install/repair

Advanced – Grades 9-12 - Choose one or two items from the list and create a report/presentation (including images) of what you did.

- Design and implement a computer network
- Secure your network
- Understand technology needs in your community.
- Help to solve these needs by organizing a committee or team to work on identified issues.
- Teach a computer science class to younger 4-Hers.
- Build your dream computer
- Network multiple micro-controllers
- Research careers in technology
- Any other similar design/install/repair

Graphic Design and Computer Art

There are three divisions; Beginner (Grades 3-5), Intermediate (Grades 6-8) and Advanced (Grades 9-12). Youth are to use a software program to create or design an item that requires graphic design or artistry. The name of the software and version is to be included with the exhibit. Exhibits are to be age/grade appropriate. Ideas include, but are not limited to, the following:

- Logo design

- T-shirt or apparel screen printing design
- Promotional brochure
- Marketing materials
- Computer generated art
- Computer altered photographs/images – Photographs taken by the 4-H member and altered by the 4-H member using a computer are to be entered in the Photography project as a creative/experimental exhibit. Youth must obtain permission from the owner before altering someone else's photograph/image and include a copy of that permission with the exhibit to insure there is no copyright violation.

Robotics

Suggested exhibits include, but are not limited to, a notebook including a printout of code with requirements marked, a flowchart showing how the robot works, images of the robot being built and the final robot in action, a video, a live demonstration, or other applicable exhibits.

Beginner – Grades 3-5

- ***Create a flowchart***
- ***Build a robot***
 - ***Use block based program to operate***
 - ***Sequential programs***
 - ***Events at beginning***
 - ***Use at least one basic sensor***

Intermediate – Grades 6-8

- ***Create a flowchart with sub-routines***
- ***Include at least two sensors in robot***
- ***Use at least three events in code***
- ***Create 2 loops in code***
- ***Operation of robot should be smooth***

Advanced – Grades 9-12 - Above guidelines plus:

- ***Use text based language***
- ***Use advanced logic including***
 - ***Multiple (three or more) events***
 - ***Multiple (three or more) loops***
 - ***At least three sub routines***
 - ***Special consideration if robot is not a kit***

ENTRY & EXHIBIT GUIDELINES FOR THE HENDRICKS COUNTY 4-H FAIR

All exhibits and entries must be made during the period indicated on the fair schedule.

1. All exhibits must be picked up during the allotted time period or ribbons and awards will be forfeited.
2. All project selections must be made on 4-HOnline. Exhibits that will be presented/displayed at the Hendricks County 4-H Fair must be entered into FairEntry online by designated date.
3. **Judges evaluating exhibits should recognize individual differences and creativity, therefore using information in this handbook as a guide rather than a requirement.**
4. All non-livestock exhibits must include an exhibit label in the lower right hand corner of their exhibit available from FairEntry. Livestock exhibits will receive stall/cage cards when the project is brought to the fairgrounds.
5. In case of an unavoidable circumstance, such as death of animal or drought, which prevents members from exhibiting, insert an explanation in your record book, signed by your parent or guardian and 4-H Leader, and turn book in at the Extension Office to be considered as completing the project.
6. White cards ("My Record of Achievement") must be turned in to exhibit in 4-H. Completion cards must be presented at check-in.
7. **Members are eligible to exhibit their project via Interactive Demonstration during the County Fair, but will not qualify for State Fair. Additionally, Interactive Demonstrations will be a non-judged exhibit option where members may showcase what they have learned in the project to the general public. All projects have the option for Interactive Demonstration exhibit at the county level.**
8. A 4-H member can exhibit in only one division of each project.
9. All exhibitors will receive ribbons. Exhibits in the livestock classes will receive ribbons designated first to tenth places with all exhibits below tenth receiving achievement ribbons. All other projects will be graded as to quality with the highest quality to receive blue ribbons; average quality, red ribbons; below average, white ribbons. Any exhibit not meeting the **guidelines** of the project will be judged on its merit then lowered one placing ribbon. Exhibit entered late, improperly, or not judged will receive a green merit ribbon. Exhibits with exceptional merit will be awarded honor group ribbons as determined by the judge.
10. **Posters are to be 22"x28" and displayed horizontally and placed in a clear plastic sleeve or covered with clear plastic to protect its contents. Display boards should be designed to sit on a table using no more than 36" of tabletop space. Space should be left in the lower right hand corner to place an exhibit tag provided by Purdue Extension Staff.**

The dimensions for the poster are 22 inches tall and 28 inches wide.

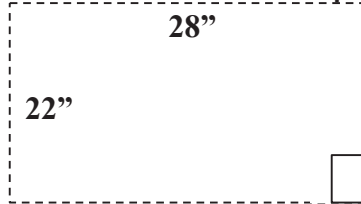


Exhibit tag comes from information entered on FairEntry prior to the 4-H Fair. The exhibit tag needs to go on the outside of the plastic sleeve in the bottom right hand corner.

11. State Fair Livestock 4-H entries are to be entered on the State Fair website by the 4-H member by June 1. The Extension Office will make all other non-livestock project entries through FairEntry.
12. Use of skateboards, skates, roller blades, and bicycles are prohibited on the grounds unless in conjunction with a fair event.
13. Dogs and other domestic animals are prohibited on the grounds unless in conjunction with a 4-H Fair event or dogs being used as service animals for impaired individuals.
14. All judges' decisions will be final.
15. **All** posters, notebooks, and display boards **MUST** include a reference list indicating where information was obtained, giving credit to the original author, to complete the 4-H member's exhibit. This reference list should/might include web site links, people and professionals interviewed, books, magazines, etc. It is recommended this reference list be attached to the back of a poster or display board, be the last page of a notebook, or included as part of the display visible to the public. A judge is not to discredit an exhibit for the way references are listed. Reference Sheets are available at the Extension Office for use.
16. For personal safety concerns, notebooks/posters/displays exhibited should only contain name, county, grade, level, and club if needed. Do not list personally identifiable information (i.e. phone, address, etc.).