# COMPUTER

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| PROJECT SUPERINTENDENT: | Andrew Schmidt, 317-774-4286, adschmidt@bsugmail.net |
| EXHIBIT CHECK-IN: | Monday, July 15, 8-8:30 AM (All Levels) |
| JUDGING: | Monday, July 15, 8:30 AM, All Levels Open Judging |
| RELEASE: | Tuesday, July 23, 9-11 AM, and 5-7 PM |
| STATE FAIR ENTRIES: | Three (3) per county, one (1) per level |

**Project Description:**
4-H members will find the Computer program challenging and fun. Youth will learn how to interact with computers, use a variety of software, add hardware, and take advantage of information from the internet. All notebooks and display boards must include a reference list indicating where information was obtained, giving credit to original author.

**Levels:**
**Beginner**          **Grades 3-5**
**Intermediate**     **Grades 6-8**
**Advanced**        **Grades 9-12**

**Exhibit Guidelines:**
- Recommended to complete a minimum of three (3) new activities each year.
- Encouraged completion of a Record Sheet and have it signed by your club leader.

Youth enrolled in the computer project will select one (1) of the below subject categories to study, regardless of grade. Youth may choose to create an exhibit demonstrating skills learned during the year. Submit 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. Poster exhibits 22" x 28" or freestanding 3-dimensional display boards no larger than 36" x 36" may be submitted. Youth may continue in the same subject category in subsequent years expanding on the previous year's topic, or choose a new topic.

Subject categories are:
- Block Based Programming ● Text Based Programming ● Computer Forensics
- Web Design and Computer Entrepreneurship ● 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 and 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.

All notebooks/portfolios 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 website links, people and professionals interviewed, books, magazines, etc. It is recommended this reference list 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 manner in which references are listed.

**Exhibit Class Guidelines:**

Programming, Block- and Text- based Programming:
Youth can submit programming projects in a language of their choosing. Some popular choices include, but are not limited to:
- Block-based: Scratch, Code Studio, Alice, etc.
- Text-based: Python, JavaScript, C/C++, C#, ASP.net, R, Go, Java, PHP, Perl, Ruby, etc.

Beginner- Grades 3-5 - Create a program using language of your choice. You should comment your work and it must include at least ten (10) 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 program using language of your choice. You should comment your work and it must include at least ten (10) different commands. Skills this program could use are:

- More robust demonstration of Beginner Skills  ● Modularization  ● Lists  ● Any other similar skill
- Commenting  ● Correct syntax  ● Functions  ● Algorithms

Advanced- Grades 9-12 - Create a program using language of your choice. You should comment your work and it must include at least ten (10) different commands. Skills this program could use are:

- More robust demonstration of Intermediate Skills  ● Parameters  ● Recursion  ● Inheritance  ● Classes
- Interact with databases  ● Integrate multiple languages into one program ● Objects  ● Methods
- Demonstrate utilization of a version control system  ● Any other similar skill

**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 (2) 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 HTML$_5$
- Modify existing CSS
- Have a unified theme throughout
- Use a photo editing software to create custom images
- Must have at least five (5) pages and include all items listed above

<u>Advanced Web Design and Computer Entrepreneurship- Grades 9-12</u> - 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 (10) pages and include all items listed above

**Computer Forensics (id theft, online bullying, ethical use of technology, responsible social media use):**
<u>Beginner Computer Forensics- Grades 3-5</u> - Research and create a 3-5 minute presentation on one (1) of the following topics. Present to a group of peers and have an adult leader verify, create a YouTube or MP$_4$ 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

<u>Intermediate Computer Forensics- Grades 6-8</u> - Research and create a 6-8 minute presentation on one (1) of the following topics. Present to a group of peers and have an adult leader verify, create a YouTube or MP$_4$ instructional video, or printed slides and notes using PowerPoint or similar presentation software.

- Digital Citizenship:
  - o Media Balance and Well Being
  - o Privacy and Security
  - o Digital Footprint and Identity
  - o Relationships and Communication
  - o Cyberbullying, Digital Drama and Hate Speech
  - o News and Media Literacy

- Cyber Security:
  - o Ethics and Society
  - o Security Principles
  - o Classic Cryptography
  - o Malicious Software
  - o Physical Security
  - o Web Security

- Any other similar topic

<u>Advanced Computer Forensics- Grades 9-12</u> - Research and create a 10-12 minute presentation on one (1) of the following topics. Present to a group of peers and have an adult leader verify, create a YouTube or MP$_4$ instructional video, or printed slides and notes using PowerPoint or similar presentation software.

- Digital Citizenship:
  - o Media Balance and Well Being
  - o Privacy and Security
  - o Digital Footprint and Identity
  - o Relationships and Communication
  - o Cyberbullying, Digital Drama and Hate Speech
  - o News and Media Literacy

- Cyber Security:
  - o Ethics and Society
  - o Security Principles
  - o Classic Cryptography
  - o Malicious Software
  - o Physical Security
  - o 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 1-2 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-H'ers
- Build your dream computer
- Network multiple micro-controllers
- Research careers in technology
- Any other similar design/install/repair
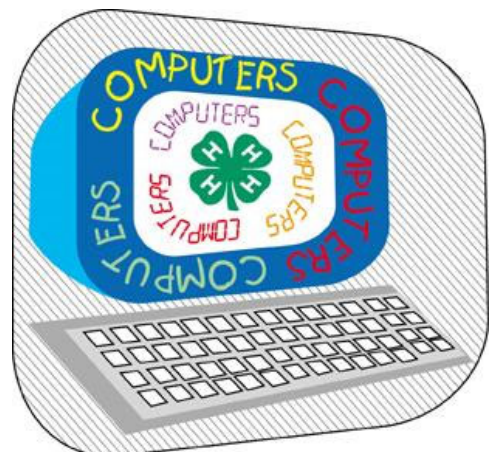
**Graphic Design and Computer Art:**

**There are three (3) 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- or text-based program to operate
    - Sequential programs
    - Events at beginning
  - Use at least one basic sensor
- Model and demonstrate robot behaviors using a simulation environment
  (e.g. VEXcode VR [https://vr.vex.com])

Intermediate - Grades 6-8
- Create a flowchart with sub-routines
- Include at least two (2) sensors in robot
- Use at least three (3) events in code
- Create at least two (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 (3) or more) events
  - Multiple (three (3) or more) loops
  - At least three (3) sub routines
  - Special consideration if robot is not a kit