



# Milwaukee County 4-H STEM (Science, Technology, Engineering and Math) Certification Program

The 4-H STEM Certification program provides youth with the opportunity to achieve mastery in science, technology, engineering and math.

The project leader will assist the 4-H member in setting and achieving their personal STEM goals.

There are 4-H resources to help the youth achieve their STEM certificate:

- The Milwaukee County 4-H Exploring STEM project, available to all enrolled Milwaukee County 4-Hers, this publication is best used as an entry level project.
- The 4-H Publications Catalog lists a variety of project materials and resources recommended for use in your project. A complete list is provided in the catalog, and on the MC STEM web page, here are just a few: Animal Science, Plant and Soil science, Environmental science, mechanical science, Aerospace, Computers.
- The Milwaukee County 4-H Educational Resources Lending Library includes other projects, books, videos and reference materials that can be checked out by leaders or a 4-H parent.
- Check with the Milwaukee County 4-H Educator to learn about local scientist, groups or organizations in your community who are willing to help with 4-H STEM.

There are three levels in the Milwaukee County 4-H STEM certificate program. You must complete each level in the following order; however the time frame is up to the youth and the leader.

- **Level I - “Explorer”**, youth begin exploring the many different aspects of STEM, youth can use the Milwaukee County 4-H Exploring STEM unit or any other approved 4-H STEM project.
- **Level II - “Researcher”**, youth conduct experiments and demonstrations on STEM project they are most interested in and prepare a paper or portfolio which will help them in Level III.
- **Level III - “Professional”** allows youth to show their leadership potential and to utilize their knowledge of science, technology, engineering and math.

As the youth work through the certificate program, a 4-H leader will date each skill item as you complete it. When all items in a level are completed, a 4-H leader or parent will sign the data sheet and send it to the Milwaukee County 4-H educator for processing of the STEM Certificate of Achievement and other awards.

**STEM Certificate Program, effective starting Oct. 1<sup>st</sup>, 2009**

*This certificate program was developed by 4-H Milwaukee County WI, it used as its model Lake County 4-H Council, California – “Arts & Crafts Proficiency Program”*

The 3 levels of STEM mastery will:

- Provide youth with opportunities to sample a broad array of experiences, measure personal progress, and become self-directed learners.
- Provide a standard of excellence where members are recognized for knowledge and skills they have mastered.
- Provide guidelines for leaders to enhance and expand project content and experiences. Members are rewarded for their personal progress and are provided with a certificate for each level.
- Completion of all three levels of a certificate indicates “mastery of a STEM subject”.
- The certificate program is voluntary.
- In level I, the youth may choose one of the STEM 4-H projects or complete the Exploring STEM (4-H Milwaukee County Publication)

To be part of the Milwaukee County 4-H STEM Certificate Effort the youth must review this packet and obtain a 4-H Leader who is willing to mentor them in the effort.

To be qualified to participate the 4-H youth and Leader must have an up-to-date enrollment form on file at the Milwaukee County 4-H office.

The 4-H STEM youth, will receive recognition for completion of each level with a special award after the completion of Level III, “Scientist” or “Engineer”

In Level I, Explorer – youth will receive a certificate of completion and will be recognized at the 4-H Leaders Association Annual meeting.

In Level II, Researcher – youth will receive a certificate of completion and a special award ribbon to be presented at Milwaukee County Fair.

In Level III, Professional – youth will receive a mastery certificate, a letter which they can use for college entrance or as a job reference, tickets for them and two other people to attend a science based field trip, such as: Discovery World, and a 4-H science/engineer metal.

For more information contact:

**Michelle Gonzalez**  
Milwaukee County 4-H Educator

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Milwaukee County 4-H, STEM (Science, Technology, Engineering and Math) Certification Program  
**Level I, “Explorer”**

**Project: Milwaukee County 4-H Exploring STEM \_\_\_\_\_ or**

**Approved 4-H STEM project \_\_\_\_\_**

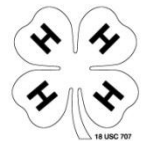
**4-H members name: \_\_\_\_\_ Club \_\_\_\_\_**

Date Completed (mm/dd/yyyy) with leader/parent initial: example 11/05/2011, MHT

- \_\_\_\_\_ 1. Attended the majority of project/club/STEM workshops and meetings
- \_\_\_\_\_ 2. Complete a minimum of 8 STEM 4-H project activities
- \_\_\_\_\_ 3. Explain the following terms: STEM and scientific method
- \_\_\_\_\_ 4. Name some safety precautions when conducting science experiments.
- \_\_\_\_\_ 5. Plan a project: Discuss all the steps needed in completing a STEM project, and explain how this is scientific method.
- \_\_\_\_\_ 6. Identify the equipment needed to conduct your STEM experiment or project.
- \_\_\_\_\_ 7. Explain how to gather ideas and items for your project.
- \_\_\_\_\_ 8. Demonstrate one science experiment at a club meeting or relevant activity.
- \_\_\_\_\_ 9. Describe one mistake/error that you made in producing a product and what you did or could have done to correct or prevent it.
- \_\_\_\_\_ 10. Visit a science store, nature center, museum, zoo or other venue that promotes scientific learning.
- \_\_\_\_\_ 11. Enter at least two of your projects at the Milwaukee County fair, a 4-H event, or a relevant Community event - name of community event \_\_\_\_\_

✓ The numbered check list can be done in any order, however all 11 items must be completed

Member’s Name: \_\_\_\_\_ Date: \_\_\_\_\_



Project Leader’s Signature: \_\_\_\_\_ Date: \_\_\_\_\_

❖ **Note if your club uses record books, attach relevant record book sheets to this document and send to the 4-H Educator.**

Provide any relevant information and send this and the completed form to the Milwaukee County 4-H Educator

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**Milwaukee County 4-H, STEM (Science, Technology, Engineering and Math) Certification Program**

**Level II - “Researcher” - 4-H STEM project title \_\_\_\_\_**

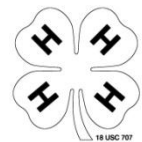
**4-H members name:** \_\_\_\_\_ **Club** \_\_\_\_\_

Date Completed (mm/dd/yyyy) with leader/parent initial: example 11/05/2011, MHT

- \_\_\_\_\_ 1. Attended the majority of the project/club/STEM workshops and meetings and complete 10 STEM 4-H project activities
- \_\_\_\_\_ 2. Report on a famous scientist, technology expert, engineer or mathematician
- \_\_\_\_\_ 3. Describe one science related invention that has been helpful in ones daily life.
- \_\_\_\_\_ 4. Invite a guest speaker, attend a STEM event or view a STEM Television show or computer program and created a one page journal on what you learned.
- \_\_\_\_\_ 5. Keep a record of your costs: cash expenses, time and labor charges to complete one of the projects or activities from the STEM project guide. Then discuss - who in your community is involved in research, what are they researching and who are the people funding the research.
- \_\_\_\_\_ 6. Explain a chemical reaction and a physical reaction and indentify one thing in everyday life that is the result of each one of these reactions.
- \_\_\_\_\_ 7. Keep a reference library or bibliography of literature that is helpful in your STEM effort.
- \_\_\_\_\_ 8. Plan and complete a STEM based community service activity by yourself or with club members.
- \_\_\_\_\_ 9. Give a demonstration regarding your project at a club meeting.
- \_\_\_\_\_ 10. Show your project/s at the County Fair, STEM competition or other 4-H event.
- \_\_\_\_\_ 11. Practice Scientific Method by looking up the definition, then write out what you would do using scientific method, include the Scientific steps for an idea, for example, you observe that the sky is blue, then complete the rest of the method steps and share this with your leader or club, include with check list.
- \_\_\_\_\_ 12. Display or enter three of your projects in the Milwaukee County Fair, a 4-H event, or a relevant Community event, name of event - \_\_\_\_\_

✓ The numbered check list can be done in any order, however all 12 items must be completed

Member’s Name: \_\_\_\_\_ Date: \_\_\_\_\_



Project Leader’s Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**❖ Note if your club uses record books, attach the record book to this document and send to the 4-H Educator. (optional)**

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**Milwaukee County 4-H, STEM (Science, Technology, Engineering and Math) Certification Program**

**Level III - “Professional”, 4-H STEM project title \_\_\_\_\_**

**4-H members name: \_\_\_\_\_ Club \_\_\_\_\_**

**Choose: I wish to become a \_\_\_\_\_ scientist, \_\_\_\_\_ technologist \_\_\_\_\_ engineer, or \_\_\_\_\_ mathematician**

Date Completed (mm/dd/yyyy) with leader/parent initial: example 11/05/2011, M.F.F.

- \_\_\_\_\_ 1. Complete one of the advanced STEM project activity guides (curriculum).
- \_\_\_\_\_ 2. Assist younger members in either Level I or Level II activities.
- \_\_\_\_\_ 3. Prepare teaching materials for use at project meetings.
- \_\_\_\_\_ 4. Work with younger members so that they can demonstrate a STEM project at an event.
- \_\_\_\_\_ 5. Speak on a project-based subject before an organization other than your local 4-H club, such as a countywide or State 4-H meeting, event or workshop
- \_\_\_\_\_ 6. Assist at the county fair or 4-H event, in an area that promotes 4-H STEM.
- \_\_\_\_\_ 7. Develop your own special project related activity. Chart your progress, plan the activities, analyze successes and problems, and report on findings.
- \_\_\_\_\_ 8. Create and conduct your own experiment, using scientific method.
- \_\_\_\_\_ 9. Enter four of your STEM projects into the County Fair, or similar community event – name of event \_\_\_\_\_, and enter a project at County Fair under Youth Leadership
- \_\_\_\_\_ 10. Prepare a report, 300 words or more, on one of the following subjects and share the information with other club members (attach a copy of the report when submitting completed form).
  - Evolution of a STEM category
  - Profile of a STEM professional
  - Importance of using scientific method
  - A STEM discovery (for the first computer)
  - Effect of one of: science, technology, engineering or math, on everyday life, make sure to include a bibliography
  - Other related topic: \_\_\_\_\_, receive approval from Leader

Member’s Name: \_\_\_\_\_ Date: \_\_\_\_\_

Project Leader’s Signature: \_\_\_\_\_ Date: \_\_\_\_\_



**❖ Note if your club uses record books, attach the record book to this document and send to the 4-H Educator. (optional)**

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