



Science, Technology, Engineering, and Math (STEM) Skill Standards Checklist

| | |
|-----------------------------|-----------------|
| Student Name. | School District |
| YA Coordinator | YA Consortium |
| High School Graduation Date | |

Certification Areas Completed:

Required Skills - For EACH Pathway

Check completed areas

- Core Skills
- Safety

Engineering & Technology Pathway

- Engineering Drafting Unit- REQUIRED FIRST
- Mechanical/Electrical Engineering Unit
- Civil Engineering Unit

Science & Math Pathway

- Bioscience Lab Foundations Unit- REQUIRED FIRST
- Bioscience Applications Unit

Level One Requirements:

Students must complete ALL listed below

Check completed areas

- Required Skills
- Minimum of **ONE** Pathway Unit
- Minimum of 2 semesters related instruction
- Minimum of 450 work hours

Level Two Requirements:

Students must complete ALL listed below

Check completed areas

- Required Skills for EACH pathway
- Minimum of **TWO** Pathway Units
- Minimum of 4 semesters related instruction
- Minimum of 900 work hours

| Total Hours Employed | Company Name | Telephone Number |
|----------------------|--------------|------------------|
| | | () |
| | | () |

Instructions for the Worksite Mentor(s) and Instructor(s)

The Skill Standards Checklist is a list of the competencies (tasks) to be achieved through mentoring and training at the worksite.

- The worksite mentor should rate each competency as the student acquires and demonstrates the skill **according to the performance criteria.**
- A competency may be revisited and the score raised as the student becomes more proficient at the worksite.
- The mentor and student should go over this checklist together on a regular basis to record progress and plan future steps to complete the required competencies.

I certify that this student has successfully completed the competencies required in my department. Circle your YA role, sign and print your name, and complete with the date signed and the department name.

SIGN this page IF you have been a mentor, trainer, or instructor of this student

| | |
|-------------------------------------|-------------------------------------|
| Mentor/Trainer/Instructor Signature | Mentor/Trainer/Instructor Signature |
| Printed Name | Printed Name |
| Department | Department |
| Date Signed | Date Signed |

| | |
|-------------------------------------|-------------------------------------|
| Mentor/Trainer/Instructor Signature | Mentor/Trainer/Instructor Signature |
| Printed Name | Printed Name |
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Operational Program Notes for Skill Standards Checklist

1. Science, Technology, Engineering, and Math Youth Apprenticeship Curriculum

- Definitions:
 - Competency- The worksite skill to be performed
 - Performance Standards- How to assess skill performance as applicable to worksite
 - Learning Objectives- Content knowledge recommended to learn these skills; may be taught by the employer, school district and/or technical college.
 - Skill Standards Checklist- The documented list of competencies completed by the YA student
 - W/S- Listed after a skill indicates that skill performance may be learned and assessed at the worksite OR in the classroom in a simulated setting. However, a simulated setting should ONLY be used IF there is no possibility of skill performance at the worksite.
- Performance Standards & Learning Objectives are located in applicable Appendices of the **Program Guide for this Youth Apprenticeship**.

2. ALL Youth Apprentices **MUST** complete the Required Skills (Core Skills and Safety) competencies for each Pathway they are enrolled in.

- The Required Skills competencies may be completed concurrently with the specific Pathway process technical competencies.
- The Required Skills are common skills specific to all Science, Technology, Engineering, and Math sub-sectors. These skills are *aligned with* the National States' Career Clusters standards for the Science, Technology, Engineering, and Math Career Cluster.

3. Youth Apprenticeship choices (depending on job placement)

- Competencies have been reviewed by the Department of Workforce Development for Child Labor Laws. Contact the Department of Workforce Development's Equal Rights Division/Labor Standards Bureau at 608-266-6860 for questions regarding child labor laws. SEE Appendix A for special Child Labor Law considerations in this YA Program.
- Students will complete a **Minimum Rating** in the Required Skills and in one pathway unit for a Level One Science, Technology, Engineering, and Math YA and a **Minimum Rating** in the Required Skills and two pathway units for a Level TWO Science, Technology, Engineering, and Math YA.
- **Units within each Pathway are unique to that Pathway.** Therefore, switching between pathways, after the successful completion of the first year, is not allowable.
- The Department of Workforce Development Occupational Certificate will indicate "Science, Technology, Engineering, and Math" attained when the program is completed.

4. Competency Ratings

- Rate the student on the competencies regularly and revisit the competencies with the student periodically to offer the opportunity for an improved rating
- Arrangements must be made to ensure that the student learns, practices, AND performs each competency **even if** that competency is not part of their regular job function
- "Entry Level" criteria should be interpreted to mean "able to do the task satisfactorily."
- "Assist" in front of a skill indicates that the student should perform the skill *as indicated in the curriculum* "while assisting a worksite professional." Training should go beyond "observation only" for these skills. It will be up to the employer to determine the criticality of each specific task, training completed, and the actual level of supervision required. See curriculum details for requirements.

Required Skills

Required of ALL Science, Technology, Engineering, and Math YA Students

Copy this page FOR EACH pathway to be completed

| CORE SKILLS | Minimum rating of 2 for EACH Check Rating | | |
|--|--|--------------------------|--------------------------|
| | 1 | 2 | 3 |
| 1. Apply academic knowledge | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Apply career knowledge | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Communicate effectively | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Act professionally | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Demonstrate customer service skills | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Cooperate with others in a team setting | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Think critically | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Exhibit regulatory and ethical responsibilities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Use basic technology | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Use resources wisely | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| SAFETY | Minimum rating of 2 for EACH Check Rating | | |
|---|--|--------------------------|--------------------------|
| | 1 | 2 | 3 |
| 1. Follow personal safety requirements | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Maintain a safe work environment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Demonstrate professional role to be used in an emergency | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Rating Scale:

3 = Exceeds entry level criteria | Requires minimal supervision | Consistently displays this behavior

2 = Meets entry level criteria | Requires some supervision | Often displays this behavior

1 = Needs improvement | Requires much assistance & supervision | Rarely displays behavior

Additional Comments –

Engineering and Technology Pathway

| Engineering Drafting Unit – REQUIRED FIRST | Minimum rating of 2 for EACH Check Rating | | |
|--|---|--------------------------|--------------------------|
| | 1 | 2 | 3 |
| 1. Apply engineering principles | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Interpret technical drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Use measuring devices accurately | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Organize databases, files, & drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Reproduce documents & plans | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Use engineering drafting software | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Develop one-view drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Develop 2D (orthographic) view drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Develop 3D view models | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Prepare auxiliary views | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Prepare section views | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Dimension drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Apply lettering & basic annotation to drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Check, revise, & record drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Participate on an engineering project | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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Additional Comments –

Engineering and Technology Pathway

| Mechanical/Electrical Engineering Unit | Minimum rating of 2 for EACH Check Rating | | |
|---|---|--------------------------|--------------------------|
| | 1 | 2 | 3 |
| 1. Apply manufacturing & mechanical/electrical systems principles | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Interpret mechanical/electrical technical drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Develop the engineering problem & plan with team | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Research physical limitations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Research required materials properties | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Research manufacturing/assembly process & limitations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Design prototype with team | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Prepare prototype technical drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Assist to build prototype | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Assist to test & revise prototype | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Assist to calculate & analyze prototype test results | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Finalize part/process technical drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Apply quality concepts to project | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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Additional Comments –

Engineering and Technology Pathway

| Civil Engineering Unit | Minimum rating of 2 for EACH Check Rating | | |
|---|---|--------------------------|--------------------------|
| | 1 | 2 | 3 |
| 1. Apply structural & building principles | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Interpret civil engineering technical drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Research codes & site requirements | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Conduct site analyses with team | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Assist to compile & analyze site measurements & other data | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Research structural requirements | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Assist to create materials specifications | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Design site structure(s) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Draw a working site plan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Construct a Bill of Materials | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Assist to create a project plan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Assist to coordinate project activities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Apply quality concepts to project | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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Additional Comments –

Science and Math Pathway

| Bioscience Lab Foundations Unit | Minimum rating of 2 for EACH Check Rating | | |
|--|--|--------------------------|--------------------------|
| | 1 | 2 | 3 |
| 1. Apply Bioscience Lab knowledge | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Use aseptic technique | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Clean & prepare glassware & instruments | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Prepare reagents, solutions, and/or buffers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Perform calculations and conversions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Weigh and measure accurately | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Operate lab equipment properly | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Conduct testing according to protocol | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Record results of testing accurately | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Maintain accurate records | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Monitor & maintain lab &/or personal inventory | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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Additional Comments –

Science and Math Pathway

| Bioscience Applications Unit – Required Competencies | Minimum rating of 2 for EACH Check Rating | | |
|--|---|--------------------------|--------------------------|
| | 1 | 2 | 3 |
| 1. Assist to organize & analyze data | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Prepare a Bioscience presentation (W/S) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| Bioscience Applications Unit – Additional Competencies | Minimum rating of 2 for EACH Check Rating | | |
|---|---|--------------------------|--------------------------|
| | 1 | 2 | 3 |
| Choose at least 6 from 22 below | | | |
| 1. Grow &/or care for plants &/or lab animals | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Collect plant or animal tissues from source | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Isolate &/or purify cells, microbes, nucleic acids, &/or proteins | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Quantify &/or identify cells, microbes, nucleic acids, &/or proteins | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Culture cells &/or microbes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Harvest cells &/or microbes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Perform spectroscopy (light, uv, IR, mass, fluorescence) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Perform chromatography (gas, TLC, HPLC) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Perform flow cytometry | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Perform microscopy | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Perform restriction digests | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Hybridize nucleic acids | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Perform gel electrophoresis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Perform amplification (PCR, RT-PCR) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Perform blot assays (Southern, Western, Northern) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Perform nucleic acid sequencing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Perform cellular assays | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Perform immunoassays (ELISA) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Perform protein assays (Bradford, Lowry) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Perform transfection/transformation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Perform basic cloning | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Run expression cloning tests | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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Additional Comments –

Additional Certifications, Training, Seminars and Projects

Please list in detail any additional certifications earned, any training and seminars attended, and/or any projects completed during the course of the Science, Technology, Engineering, and Math Youth Apprenticeship.

| | | |
|----------------|-------------------------------------|-------------|
| Description | | |
| Notes/Comments | | |
| Date Completed | Mentor/Trainer/Instructor Signature | Date Signed |

| | | |
|----------------|-------------------------------------|-------------|
| Description | | |
| Notes/Comments | | |
| Date Completed | Mentor/Trainer/Instructor Signature | Date Signed |

| | | |
|----------------|-------------------------------------|-------------|
| Description | | |
| Notes/Comments | | |
| Date Completed | Mentor/Trainer/Instructor Signature | Date Signed |

| | | |
|-------------------------|--|--|
| Other Notes or Comments | | |
|-------------------------|--|--|