



## 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 |
|----------------------|--------------|------------------|
|                      |              | (   )            |
|                      |              | (   )            |

## 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<br>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<br>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 –

## Science and Math Pathway

| Bioscience Lab Foundations Unit                    | Minimum rating of 2 for EACH<br>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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## 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                        |
| <b>Choose at least 6 from 22 below</b>                                  |   |                          |                          |
| 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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